

Top-Up with Driver

Digital Money, Transactional Aspirations, and Peerhood in Yogyakarta, Indonesia

PhD Thesis

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Abstract

Across the world, people are enlisted in the so-called 'gig economy' either as users or providers of digital services. In this thesis, I examine how digital ride-hailing apps in Indonesia, Gojek and Grab, have evolved from transport to a broader platform of financial services, including privately issued e-money, and how they advocate for the expansion of cashless peer-to-peer (P2P) payment systems. I investigate how their driver fleets are configured as an extended social infrastructure of the app environment and how their algorithmic labour management mobilises drivers to facilitate the use of digital payments by customers of the app. I argue that promoting the notion of peerhood by the companies both obfuscates how their apps configure users to participate in new hierarchical exchange relationships, as well as minimizes the companies' role as intermediary. Since the circulation of money and data is where their profits are derived and the companies advertise themselves as providers of social equity, I further contend that this transactional constellation camouflages the financial interests that these companies have in generating platform activity. During six months of fieldwork in Yogyakarta, between 2018 and 2019, I explored these transactional dynamics by extensive use of the apps and by meeting both their drivers and customers, along with various fintech industry representatives and other local stakeholders. Through this work, I show that the exchange of digital money through these ride-hailing apps constitutes far more than the financial transaction and contains much more than can be summarized in an elegant acronym.

Summary

Across the world, people are enlisted in the so-called 'gig economy' either as users or providers of digital services. In Indonesia, this is exemplified by the digital ride-hailing apps Gojek and Grab. In the past few years, both app companies have expanded their platforms from the core of transport to a broader ecosystem of financial services. Central to this development is their integrated payment mechanisms that allow customers to purchase privately issued digital credits known as e-money, which can be used to make transactions and pay for services within the respective platforms. This thesis focuses on the intersecting dynamics of the digital labour platforms and digital payments as manifested in these ride-hailing apps. Specifically, I identify how the algorithmic management and infrastructural arrangements of on-demand labourers affect the circulation of money through the integrated payment system of the digital platforms.

These digital platforms operate in a context where a majority of the population do not use credit or debit cards to make digital payments, and the ability to temporarily store money can be a valuable technology. I argue that these ride-hailing companies benefit from their access to a fleet of on-demand drivers who already use the apps to access customers. By reconfiguring the drivers as an extension of the digital app environment, the apps enable drivers to sell their digital credits in return for cash. Thus, they operate as exchange agents: an access point to the digital economy for the app's customers enabling the circulation of value in the apps. Meanwhile, these financial technology companies leverage arguments of 'financial inclusion' as they advocate for the expansion of digital payment services, such as cashless peer-to-peer (P2P) transactions. I critically examine how this emphasis on financial inclusion and 'turn to cashlessness' can also be understood as a means by which these financial technology companies grow their customer base. Unpacking this acronym, I explore how the term 'peer' introduces social meanings to a transaction, differing, for instance, from that of 'user-to-user payments'. I argue that this concept obscures the complex relational dynamics involved in such transactions, while also obfuscating the extent to which the intermediary companies that provide the digital infrastructure can influence the conditions of exchange.

Thus, this thesis examines how these apps configure the transactional relationship of their users. I argue that the mobilisation of drivers and their digital wallets is done in service of the app's customers. Drivers not only facilitate exchange but also facilitate the existence of a digital payment system by taking on the transactional costs of reconvertng digital earnings into cash. I argue that the platform companies benefit from, and reinforce existing socio-economic inequalities, while also introducing new digital hierarchies in pursuit of making their digital services both cheap and convenient to attract customers. Furthermore, I emphasise that this constellation camouflages the

companies' priority of generating transactional activity; app usage leads to the circulation of both money and data, which is where their profits are derived.

During six months of fieldwork in Yogyakarta, between 2018 and 2019, I explored these transactional dynamics by using the apps and meeting both their drivers and customers, along with various fintech industry representatives and other local stakeholders. Through this work, I show that the exchange of digital money through these ride-hailing apps is about far more than the financial transaction and contains much more than can be summarized in an elegant acronym.

Resumé

Overalt i verden bliver mennesker i stigende grad indsluset i den såkaldte 'gig økonomi' enten som brugere eller udbydere af digitale tjenester. I Indonesien eksemplificeres dette blandt andet af de digitale transport-apps Gojek og Grab. De sidste år har virksomhederne bag disse apps udvidet deres platforme fra transport til et bredere økosystem af digitale finansielle tjenester. Centralt i denne udvikling er integrerede betalingsmekanismer, som giver kunder mulighed for at købe privat udstedte digitale kreditter, såkaldte 'e-money', der kan bruges til at foretage transaktioner og betale for tjenester inden for de respektive platforme. Denne afhandling fokuserer på dynamikkerne mellem de digitale arbejdskraftsplatforme og digitale betalinger, som de kommer til udtryk i transport-appsene. Konkret identificerer jeg, hvordan brugen af algoritmer og de infrastrukturelle arrangementer for 'on-demand'-arbejdere påvirker cirkulationen af penge gennem det integrerede betalingssystem på de digitale platforme.

Jeg hævder, at disse virksomheder drager fordel af deres adgang til en flåde af 'on-demand' chauffører, der allerede bruger virksomhedernes apps til at få adgang til kunder. Ved at omkonfigurere chaufførerne som en udvidelse af den digitale infrastruktur, gør appsene det muligt for chaufførerne at sælge deres egne digitale kreditter til gengæld for kontanter. Chaufførerne fungerer således som pengevekslere, og dermed et adgangspunkt til den digitale økonomi for appens kunder. Disse teknologier fungerer i en sammenhæng, hvor et flertal af befolkningen ikke bruger kredit- eller betalingskort til at foretage digitale betalinger og hvor muligheden for midlertidigt at indsætte penge digitalt kan være en værdifuld teknologi. Faktisk udnytter de samme finansielle teknologivirksomheder argumenter om 'økonomisk inklusion', da de er fortalere for at udvide brugen af digitale betalingstjenester såsom kontantløse 'peer-to-peer' (P2P) -transaktioner. Jeg undersøger kritisk, hvordan dette fokus på finansiel inklusion og kontantløshed også kan forstås som et middel, hvormed de finansielle teknologivirksomheder kan udvide deres kundebase. Gennem en analyse af akronymet P2P undersøger jeg, hvordan udtrykket 'peer' introducerer sociale betydninger for en transaktion, der adskiller sig fra f.eks. 'user-to-user'-betaling. Jeg argumenterer for, at konceptet forsimples den komplekse relationsdynamik, der er involveret i sådanne transaktioner, samtidig med at det tilslører i hvilket omfang de virksomheder, der leverer den digitale infrastruktur, påvirker udvekslingsbetingelserne.

Afhandlingen undersøger således, hvordan disse apps konfigurerer deres brugeres transaktionsforhold. Jeg hævder at mobilisering af chauffører og deres digitale tegnebøger – såkaldte 'wallets' – sker til fordel for appens kunder. Chauffører faciliterer ikke kun udveksling, de muliggør også eksistensen af et digitalt betalingssystem ved at påtage sig de

transaktionsomkostninger, der er forbundet med at konvertere digital indtjening til kontanter. Jeg hævder at platformfirmaerne drager fordel af og styrker eksisterende socioøkonomiske uligheder, samtidig med at de indfører nye digitale hierarkier i deres stræben efter at gøre digitale tjenester både billige og bekvemme for at tiltrække kunder. Desuden argumenterer jeg for, at denne konstellation camouflerer at selskabernes prioritering er at generere transaktionsaktivitet, da dette fører til cirkulation af både penge og data, hvorfra deres profit stammer.

I løbet af 6 måneders feltarbejde i Yogyakarta mellem 2018 og 2019 udforskede jeg disse transaktionsdynamikker ved at bruge de forskellige apps og møde både deres chauffører og kunder samt forskellige repræsentanter for fintech-branchen og andre lokale interessenter. Gennem dette arbejde viser jeg, at udvekslingen af digitale penge gennem transport-appsene handler om langt mere end den økonomiske transaktion og indeholder meget mere, end der kan opsummeres i et elegant akronym.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
API	Application Programming Interface
ATM	Automated Teller Machine
BAPPEBTI	<i>Badan Pengawas Perdagangan Berjangka Komoditi:</i> Indonesian Futures Exchange Supervisory Board
BBM	Blackberry Messenger
BCA	Bank Central Asia
BI	Bank Indonesia
GNNT	<i>Gerakan Nasional Non-Tunai:</i> National Non-Cash Movement
IoT	Internet of Things
IPS	Indonesia Payment System
IT	Information Technology
JDV	Jogja Digital Valley
KK	<i>Kartu Keluarga:</i> family identity card
KKS	<i>Kartu Keluarga Sejahtera:</i> card issued to poor households to receive social assistance
KTP	<i>Kartu Tanda Penduduk:</i> personal identity card
KYC	Know Your Customer
MNO	Mobile Network Operator
NFC	Near Field Communication
NICA	Netherlands Indies Civil Administration
OJK	<i>Otoritas Jasa Keuangan:</i> Financial Services Authority
ORI	Oeang Republik Indonesia
P2P	Peer-To-Peer
PM	<i>Putus mitra,</i> concept described in glossary

PoS	Point Of Sale
PT	<i>Perseroan Terbatas</i> : Indonesian version of a limited liability company
QR	Quick Response
QRIS	QR Code Indonesian Standard
Rp	Indonesian Rupiah (currency code: IDR)
SEA	Southeast Asia
SIM	Subscriber Identification Module
SMS	Short Message Service
SNKI	<i>Strategi Nasional Keuangan Inklusif</i> : National Financial Inclusion Strategy
UGM	Universitas Gadjah Mada
US	United States
USD	United States Dollar

GLOSSARY

<i>Cair</i>	Liquid or fluid, like water.
<i>Cashback</i>	The mechanism by which the app credits your digital wallet with a percentage of the money you have already spent.
<i>Dompét</i>	Wallet
<i>Dompét elektronik</i>	Digital wallet. Refers specifically to the accounts customers make with platform companies where they can store and access a digital credit balance.
<i>Gacor</i>	A contraction of the words <i>gampang cari orderan</i> , meaning ‘easy to search for orders’. This refers to a specific condition for a driver account that has been used in such a way that it frequently receives orders by the algorithm that distributes orders.
<i>Gagu</i>	Muted or silent. Refers to situations where a driver account receives none or few orders by the algorithm that distributes orders.
<i>Isi ulang / top-up</i>	Refill. Can be used to describe various situations where an account is ‘recharged’. In the context of digital payments the English phrase ‘top-up’ is generally used, describing situations where cash is converted into digital credit, thus refilling the digital account.
<i>Kerja dobel</i>	Double work. Sometimes used by drivers to describe having accounts with both Gojek and Grab and thus working for competing companies.
<i>Mitra</i>	Partner. Generally refers to business partners, but is used by both Gojek and Grab to describe the position of the drivers. This is similar to the vernacular deployed by many other ride-hailing companies which also refer to their driver fleets as ‘driver-partners’.
<i>Ojek</i>	A type of informally organized motorcycle taxi.
<i>Ojol</i>	A contraction of the words <i>ojek online</i> . Used to distinguish drivers working through the apps compared to conventional or ‘offline’ drivers.
<i>Order fiktif</i>	Fictional order. Used by drivers to describe being ‘pranked’, receiving orders, only to realise no customer is waiting to be picked up or to receive their food delivery. Sometimes also used by the app companies to describe

situations where drivers ask friends to place orders or place orders themselves to generate points for completed trips without 'real' customers.

<i>Promo</i>	Promotional offer. Typically offered by companies in the form of discounts or cashbacks.
<i>Pulsa</i>	Prepaid phone airtime.
<i>Putus mitra</i>	Broken partnership. Describes situations where the app companies 'cut' the partnership agreement with the driver, meaning they are permanently suspended and lose access to their accounts.
<i>Saldo</i>	Account balance.
<i>Telco</i>	Mobile Network Operators
<i>Terapi</i>	Therapy. Used in relation to 'account therapy', a concept that loosely describes a variety of practices to improve the 'quality' of an account from being <i>gagu</i> to being <i>gacor</i> .
<i>Tupo</i>	A contraction of the words <i>tutup poin</i> , meaning to 'close the points'. Used by drivers to describe having reached their daily incentive point targets to receive the daily bonus.
<i>Uang elektronik</i>	Electronic money.
<i>Vendor</i>	Specifically used to describe 'account vendors'. Companies that provide an alternative way to register for a GoCar driver account than directly through the company.

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INTRODUCTION

“Would you like a top-up?”

Variations of this question were a prominent part of my experience when engaging with the so-called ‘online drivers’ of Indonesian ride-hailing apps in Yogyakarta. In practice, after accepting the driver’s offer to facilitate a ‘top-up’ of my account, we agree on an amount denominated in Indonesian rupiah (Rp) and the driver uses the integrated payment mechanism of the ride-hailing app to transfer digital money to my account. In exchange, I hand over the equivalent value in cash. Having thus ‘topped up’ the digital wallet in my app, I can use the replenished digital credit balance as payment for the next trip I book through the app, rather than paying in cash.

The exchange begs the question, what is the purpose of existence for this digital and app-based payment infrastructure? For those familiar with the seamless digital transactions of similar ride-hailing apps, such as Uber or Lyft, this moment of exchange between drivers and passengers may seem peculiar or cumbersome. Why not just pay this driver with cash in the first place? Regardless, digital payments through smartphone-based applications have recently been popularized in Indonesia, allowing people to make cashless transactions without a debit or credit card. Sometimes referred to as peer-to-peer (P2P) transactions, such apps allow users to make a cashless money transfer directly to another user by using digital infrastructure provided by a company, thus bypassing formal financial institutions like banks. In Indonesia, they rely on a fundamental mechanism that allows users to convert cash into a digital credit balance, and here, the ride-hailing apps benefit from a fleet of drivers operating as exchange agents: an extension of the digital payment infrastructure. Why is it that cash is necessary for supporting these allegedly ‘cashless’ transactions?

This thesis studies how the dynamics of ride-hailing applications affect the circulation of money through integrated payment platforms in Indonesia. I explore how this deployment of P2P

financial services affects the use of existing payment infrastructures, digital and non-digital, and what I refer to as the more general social infrastructures of money in Indonesia. To do so, this thesis is organised according to the following five sub-research questions:

1. How does the concept of a P2P transaction affect expectations of use, and the practical, relational, and infrastructural conditions of a digital payment system?
2. How did the Indonesian payment apps emerge at the intersection of infrastructures for connectivity and payment?
3. How do ideas about cashless payments align with the concept of financial inclusion and socio-economic hierarchies, and how are these reflected in the app infrastructure?
4. How does value circulate in the payment infrastructure of the Indonesian apps, how is it materialised, and how are the transacting parties configured?
5. How do the labour dynamics of these ride-hailing apps mobilise drivers in service of the digital economy, and how does this influence existing socio-economic inequalities between drivers as well as their passengers?

In a context where credit and debit card use remains lower than access to mobile phones, apps allowing people to convert cash into a digital balance represent a novel way to store and employ forms of value (Azali, 2016). In Indonesia, two of the most prominent digital payment apps, GoPay and OVO, distinguish themselves for having both gained traction as the integrated payment mechanism of competing ride-hailing apps Gojek and Grab, respectively. Through fleets of what ride-hailing company vernacular refers to as 'driver-partners' (Rosenblat and Stark, 2016, p. 3761), they have been able to convert customers of their transport service into customers of their financial services. They have brought people who were not formally using digital payments into the digital economy, specifically, the version of it that exists inside their respective platforms. Thus, in the Indonesian context, the emergence and increasing dominance of digital payment is intimately entangled with the use of ride-hailing apps.

Gojek and Grab draw inspiration from their Western counterparts from Silicon Valley, which have received increasing scholarly attention in the exploration of the exploitative practices of the so-called 'gig', platform, or on-demand economy (cf. Dubal, 2017; Gray and Suri, 2019; Gregory, 2020; Rosenblat, 2018). As these technologies are incorporated into diverse contexts, it is critical to explore how they are being translated, and how subsequent technological innovations might, in turn, inspire developments abroad. Recent work seeks to centre the Southeast Asian experiences of ride-hailing apps, with a particular emphasis on the experiences of drivers, to show how these new technologies affect the organisation of labour (cf. Ford and Honan, 2019; Jack, 2020; Nastiti, 2017; Qadri, 2020a). This thesis contributes to this field with a novel perspective by focussing on

the intersection of the ride-hailing platforms and digital payments in Indonesia, by examining how online drivers are mobilised to facilitate the circulation of digital money.

The payment mechanisms of GoPay and OVO model themselves on financial technologies, known as fintech, premised on the concept of P2P transactions. Where the transfer of money has traditionally been the domain of conventional financial institutions, fintech has enabled new actors, often from the technology or communication industry, to establish novel private digital payment infrastructures (Maurer, 2012; Swartz, 2020). Advocates of these technologies frequently argue that they are a cheaper, faster, and safer form of payment than cash, one that is more accessible for the many people who have access to mobile phones but are otherwise marginalised by the conventional financial system (Donovan, 2012; Onoguchi et al., 2011). Thus, digital money and P2P payments through mobile phones have become an intrinsic component of global initiatives towards 'financial inclusion' and 'poverty alleviation' (Rea and Nelms, 2017). In some instances, advocates suggest digital payments not just as an alternative to cash, but argue for a transition *away* from cash entirely, arguing that digital payments will improve lives, reduce poverty and create 'inclusive growth' (cf. Better Than Cash Alliance, 2019).

In Indonesia, policies that emphasise digitisation as a path toward increased economic development result in an emphasis on the role of digital payments in a modern society, with the central bank, Bank Indonesia (BI), advocating for and implementing policies in support of a transition towards what they call a 'less-cash' society (cf. BI, 2014; Ministry of Industry, 2018; SNKI, 2017). Recently, Indonesia is gaining an international reputation for being a growing fintech market, and companies such as Gojek leverage arguments about contributing to financial inclusion through their products, emphasising their alignment with government goals to make Indonesia a dominating 'digital economy' in Southeast Asia (Gojek, 2017). Of course, the advancement of fintech and emphasis on engaging the 'unbanked' through P2P transactions can also be considered a strategy for converting a large number of people into customers of these new payment infrastructures (Elyachar, 2005; James, 2015; Roy, 2010). These are customers who can be expected to stay within their respective platforms as the companies continue to expand from transport to payment, to broader financial services.

The Circulation of Money, Services, and People in Digital Capitalism

This thesis exists at the intersection of several fields. Though its empirical case takes the form of a ride-hailing app, its analytical object is the reproduction of inequalities stemming from the particular configurations of money, services, and people circulating within the app ecosystem. The significance of this research can be considered in theoretical, methodological, and empirical

terms. Broadly, this work provides insights into the emergence of Indonesian digital wallets and the mechanics of transaction that they enable through the empirical study of Gojek and Grab that particularises the dynamics of the integrated payment mechanisms of ride-hailing apps in Indonesia. By drawing on literature from economic anthropology and science and technology studies to explore the concept of P2P payments, I uncover novel insights into how these apps mobilise their respective driver-partner fleets in relation to their customers; first, to engage new users of digital money, and second, to enable the circulation of value within the system. Studying the type of exchange enabled by the GoPay and OVO digital wallets further enlightens us on how this technology influences the relationship of the transacting parties as well as the circulation of money. Using existing literature as a foundation, this work examines the infrastructural mechanisms of these payment apps and how they mobilise drivers as an extension of the payment infrastructure that enables cashless payments. The empirical material for this research comprises both fieldnotes and interviews gathered throughout ethnographic fieldwork complemented by qualitative digital methods to engage with these systems at the interface level. Through this approach, I examine the enabling and restricting mechanisms for transaction embodied by the user interfaces and the sometimes-subtle cultural communication conveyed through the visual language of the app interface. Thus, this thesis examines the underlying infrastructures of payment through the lived experience of its users.

In this section, I turn to the broader theoretical context to which this thesis contributes, namely that of digital capitalism. Both Gojek and Grab initially functioned as a platform providing the intermediating interface between service users and service providers. It is the integration of their own payment mechanisms that have enabled the apps to expand to include a broad range of services which are all contained within the ecosystem of their platforms. For Gojek, the self-declared goal of this is to become a 'super-app': an app that provides for all of a customer's wants and needs by hosting other 'apps' within the overarching umbrella of a single platform. As the head of the Gojek data engineering team writes on the company blog, "The biggest moat GOJEK built is payments. Once you're handling money for a user, you can build a castle of services within it" (Ponnappa, 2019). This moat is comprised of the digital credits issued privately through the GoPay wallet. Purchased using Indonesian rupiah, these GoPay credits can be used for services accessed within the Gojek platform. Thus, it is Gojek that controls the metaphorical drawbridge which both gives access to, and confines money, services, and people within the moat's boundaries. It is this expansion from a ride-hailing app into the centre of our socio-economic exchange practices and the subsequent dynamics these platforms introduce to the circulation of value that deserves increased scholarly scrutiny.

The concept of digital capitalism was first introduced by Dan Schiller (1999) as a means of describing the increasing commercialisation and corporatisation of the early Internet. In its original meaning, it describes the expanding use of network technologies by private companies to broaden their market reach and boost financial gain. That is, a form of capitalism now supported by digital infrastructures. Jonathan Pace argues that this definition focuses on digital capitalism as a specific event, or stage of industrial development: having transitioned from mechanisation to mass-production, digitalisation would further automation and increase access to consumers across an increasingly networked globe. Rather than considering it to be a particular historical moment, digital capitalism could be understood as a “collection of processes, sites and moments in which digital technology mediates the structural tendencies of capitalism” (Pace, 2018, p. 262). Digital technology does not radically change what capitalism is; rather, it enables new forms of production, labour, and exchange. Exploring the Gojek and Grab platforms through this lens of digital capitalism encourages an examination of how digital technology functions as both ‘circulation’ and ‘labour’ infrastructure (Pace, 2018, pp. 263–264). Thus, the investigation of how these apps 1) extract value through the circulation of money, people, and services, and 2) mobilise labouring bodies through digital technology centres this thesis at the crossroads of digital payments and the dynamics of ride-hailing platforms.

Circulating Value

Though ride-hailing companies could be said to be in the transport service industry, they more often identify themselves primarily as technology companies (Rosenblat, 2018). By this definition, the main service that the companies are providing is the digital platform that allows service users and service providers to meet. In doing so, they neglect to emphasise “a more important feature of that technology: Big Data” (Rosenblat, 2018, p. 141). As drivers and passengers engage through the platform, they provide the apps with extensive data traces through their movement and preferences. For Uber, this can be used to manage driver behaviour, but as apps such as Gojek and Grab expand into broader financial services, this data could enable targeted advertising and user recommendations or even credit ratings. Digital technologies have enabled unprecedented levels of generating and aggregating personal data, and with digital capitalism, this data is commodified and thus converted into a valuable product. This process can be referred to as ‘surveillance capitalism’ (Zuboff, 2019), by which value is extracted through the mining, analysis, and sale of data as an information product. Information is a powerful commodity that can, theoretically, enable companies to anticipate, and possibly even guide, consumer behaviour. It is no surprise that Uber also continues to expand its business through the purchasing of competing delivery services, utilising their existing driver fleets to become a ‘one-stop-shop for everything’ for their

customers (Miller, 2021). Similarly, the control over both the platform of services and the integrated payment services enables Gojek and Grab to accumulate vast amounts of ‘transactional metadata’ about their users (O’Dwyer, 2018).

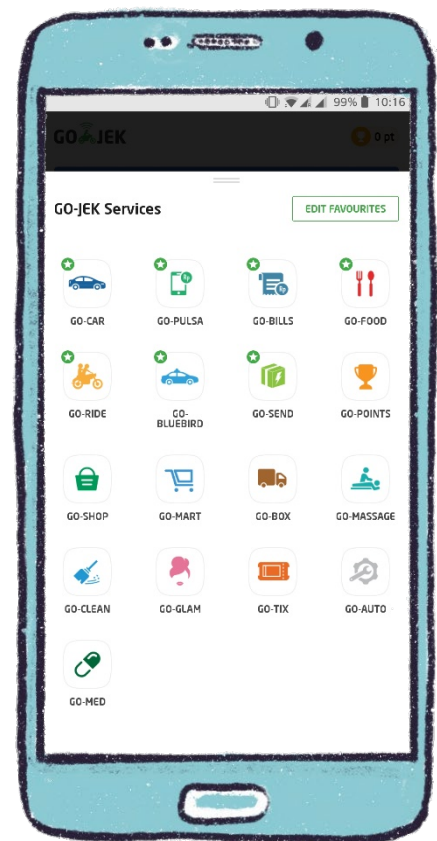
This business model leads companies to strive for the monopolisation of the resource comprised by data. Thus, companies strive to engage and retain users within their metaphorical castles, in what can be described as ‘platform capitalism’ (Srnicsek, 2017). The asset that these platforms develop is the infrastructure that enables the capturing and extraction of data upon which other services are built. As Nick Srnicsek writes:

“Enabled by digital technology, platforms emerge as the means to lead and control industries. At their pinnacle, they have prominence over manufacturing, logistics and design, by providing the basic landscape upon which the rest of the industry operates.” (Srnicsek, 2017, p. 92)

By creating this infrastructure, the platforms can act as gatekeepers, with the end goal of monopolising the resource that data comprises. By commodifying data, these platforms reconfigure ownership over data from the person who generates it into a tangible asset of the company; as a result, these companies control access to effectively exercising rentiership by extracting value rather than creating it (Birch, 2020). As public awareness of surveillance capitalism spreads, there are increasing demands for user control over data or calls for privacy, but, as Srnicsek points out, these “miss how the suppression of privacy is at the heart of this business model” (Srnicsek, 2017, p. 101). Arguably, before discussing the right to access or use data, one could ask why it is permissible to generate and store it at all. The tendency to monopolise access also means that many of these companies tend to build ‘enclosed ecosystems’ or silos that keep user engagement within one platform. The expansiveness of this strategy is, perhaps, best illustrated by Srnicsek’s example of Facebook’s attempt to deliver ‘free’ ‘basic internet’ to users in countries with limited internet access: “Facebook’s own services would be provided for free, but other services would have to partner with Facebook and go through its platform, effectively enclosing the entirety of the internet” within the Facebook silo (Srnicsek, 2017, pp. 110–111). As companies such as Gojek and Grab continue to expand their platform of services, their expansion does not generally involve investing in productive machinery or even the skills of their labourers. Instead, platform companies invest in and concentrate on infrastructures of information to the point that they are “becoming owners of the infrastructures of society” (Srnicsek, 2017, p. 92). It is the digital infrastructure itself, its algorithms, interfaces, and governing mechanics, its data centres and public acceptability, that are valuable to the company: the castle and the moat of digital payments.

As these platforms come to play an increasingly central role in providing the infrastructure for the circulation of money, it is important to consider how the rules of transaction become automated and encoded within the systems themselves. Rachel O'Dwyer (2015a) describes the discrepancy between the traditional regulatory reliance on interpretation and flexibility on a case-by-case basis for arbitration and the more rigid control implemented by algorithmic governance over the actions of its users within the payment infrastructure. The software created by the intermediating platform companies define the parameters for how value appears and circulates within these digital payment systems. O'Dwyer paraphrases Donald Mackenzie (2008) in that "algorithms are 'engines not cameras'" (O'Dwyer, 2015a, p. 3), indicating that these apps do not simply model existing transactional patterns, but rather play a significant role in configuring users and determining what money is and to whom it belongs.

By referring to themselves as platforms, these companies benefit from the conceptual ambiguity of the term which allows them to work "not just politically but also discursively to frame their services and technologies" (Gillespie, 2010, p. 348). For example, Uber presents itself as a technology platform rather than a transport service, framing its drivers as platform users rather than employees. The term draws on a variety of distinct social meanings that lend it 'discursive resonance', leading users to perceive platforms as "open, neutral, egalitarian and progressive support for activity" (Gillespie, 2010, p. 352). Though platforms may claim to be neutral intermediaries, the companies make important curatorial decisions behind the scenes through their infrastructural design, deployment of algorithms, and defining terms and conditions of use. This is true of platforms such as Facebook and YouTube, but also ride-hailing apps such as Gojek and Grab as they become an access point for everything from food delivery to massage,



*Screenshot 1: Overview of Gojek services.
27 June 2018.*

from cleaning services to the payment of bills. It is not Gojek that provides massages, cooks food, or cleans your house; as with their driver fleet, they rely on merchants to register on the platform, which means they decide who participates and under what conditions. As customers come to depend on the platform for easy access to these services, merchants too come to depend upon them to access customers. As customers come to depend on 'hassle-free' digital payments, the

affiliated merchants come to depend on the platform to 'handle their money', building a cycle of supply and demand that is wholly under the control of these digital platforms.

This veneer of neutrality obscures not just the curatorial control, but the extent to which these 'automated' systems and their governing algorithms "are products of ordinary human engineering" (Seaver, 2019, p. 423). It obscures the extent to which these technologies reflect the positionality, biases, norms, and values of their creators (Noble, 2018). The outcome can be the codification and thus exacerbation of existing structural inequalities, 'encoding inequity', particularly against those people who already experience marginalisation and discrimination (cf. Benjamin, 2019; Costanza-Chock, 2020).

Organising Labour

When platforms present themselves and their technologies as neutral, they lean into a narrative of automation that conceals the underlying human labour involved in the creation of technology, its functioning, as well as its outcomes. In the context of digital capitalism, the 'aura of the digital' "reifies capitalist ideology by masking the role and importance of an underlying physical reality" (Betancourt, 2015, p. iv). Essentially, digital capitalism creates the illusion that the continued expansion of wealth can take place without the consumption of resources. Michael Betancourt (2015) refers to this process as an outcome of the 'ideology of automation', by which the elimination of human labour from production, replaced entirely with digital technology, is considered a desirable outcome of digital capitalism. As with previous examples of industrial automation, the human is not removed in practice, their labour is simply displaced, with digital technology changing the conditions and nature of their work. The human labour that goes into creating, training, and maintaining digital systems is rendered invisible for the users of a technology, leading them to believe that the object with which they are engaging is fully automated; the aura of the digital and the ideology of automation persist to the point of illusion (cf. Gray and Suri, 2019, 2017). Writing about the experiences of platform workers, Mary L. Gray and Siddharth Suri (2019) describe how this deception not only leads to a lack of transparency about the functioning of these digital systems, but also leads to a devaluation of the human labour involved. The outcome is an industry that increasingly relies on human labour to engage in 'digital piecework' rather than labouring under the conditions of stable employment:

"Platform-driven innovations deliver goods and services to businesses and consumers under the pretence that a combination of APIs and artificial intelligence have eliminated what traditional employers used to pay for, namely, recruiting, training, and retraining workers. [...] automation, far from eliminating those costs, predominantly shift them to workers." (Gray and Suri,

2019, p. 173)¹

The mediation of labour relations through digital technology obscures the resources required to maintain the illusion of automation. By shifting costs of production onto the labourers, the companies can focus investment on the platform infrastructure itself and extract additional value from the people whose labour makes it function. Gray and Suri refer to these people as ‘ghost workers’: the human labour behind seemingly automated digital technologies are, in fact, “often intentionally hidden” (Gray and Suri, 2019, p. ix), thus maintaining the public illusion of a fully automated system or artificial intelligence (AI). The role of ‘ghost workers’ is to be available, to be ‘on-demand’ for the tasks that cannot be automated and cannot independently be completed by a digital system. To handle such a distributed network of workers, platform companies deploy forms of algorithmic management that both assign and evaluate work, along with introducing automated control mechanisms for how that work is completed (Lee et al., 2015). Focusing on drivers working for ride-hailing apps, such mechanisms include elements of surveillance, ratings, order distribution and acceptance, as well as pre-determined pricing for trips (Rosenblat and Stark, 2016). The automation of these labour governance mechanisms benefit from the same veneer of neutrality within the platforms and suggest that a ride-hailing company is “not responsible for inconsistencies in its system; rather, automated functions, such as algorithmic pricing or blind passenger acceptance, are part of the interaction design.” (Rosenblat and Stark, 2016, p. 3771). Meanwhile, information asymmetry between drivers and the companies means that drivers are not provided with adequate information to fully understand the conditions under which they are working. The platform companies deploy mechanisms that ‘gamify’ labour, but the uncertainty of algorithmic management creates “conditions where workers are fundamentally unsure about the rules” (Gregory, 2020, p. 12) governing their labour.

In practice, these platform companies make use of digital technologies to implement mechanisms that enable them to better control their distributed workforce. In doing so, they change the labour relations in such a way that labourers find it increasingly difficult to contest ‘decisions’ made by their algorithmic managers. In effect, these technologies undermine hard-fought battles for labour rights and weaken the relationship between work and financial security (Dubal, 2017). The increasing use of digital technology to manage a workforce means that “traditional employment contracts are being replaced by a platform’s “terms of service.”” (Gray and Suri, 2017, p. 93). Workers are treated as users of a platform, with the ‘agreement’ that if they do not like the conditions offered, they can just walk away. In practice, this creates situations where those who

¹ API stands for Application Programming Interface

are not in a position to 'walk away' become particularly vulnerable to exploitation. As Niels van Doorn observes, "Platform labor remains thoroughly embedded in a world created by the capitalist value form, which hinges on the gendered and racialized subordination of low-income workers, the unemployed and the unemployable" (van Doorn, 2017, pp. 907–908). These technology companies benefit from existing structural socio-economic inequalities that grant them constant access to a broad pool of workers, while the individual workers are put in the position of being independent contractors who depend on admittance to these platforms for access to income.

Besides the illusion of automation, part of what generates public acceptance of these platforms is the romanticised notion of the individualistic 'entrepreneurial' spirit? which obscures the labour relations that they introduce (Ravenelle, 2017). These narratives create the impression that the platforms give access to the opportunity for anyone to be a self-employed entrepreneur, thus 'disrupting' the conventional labour market (Geiger, 2020; Hogarth, 2017). Alternatively, one could posit that this digital infrastructure gives access for anyone to be a temporary employer of cheap and convenient labour. The disruption narrative implies that digital technology will revolutionise existing systems and services: Uber will revolutionise the taxi industry, digital money will revolutionise cash! Yet, these narratives also function as 'political technologies' that "conjure in equal measure the necessity and inevitability of this revolution" (Geiger, 2020, p. 20). Susi Geiger points out how the venture capital of Silicon Valley is oriented towards 'myth-building' and the intersecting mythologisation of finance and disruption embodied in fantastical creatures such as 'tech-unicorns', to the point that "Unicorns, for instance, have recently lost investors' interest to even rarer beasts called 'decacorns', that is start-ups likely to reach valuations of over US\$10 billion" (Geiger, 2020, p. 19). Thus, platform companies not only extract value from their digital infrastructure but also leverage it to access venture capital by promising investors to be the proverbial wings of another digital revolution.

The narrative of entrepreneurship in Silicon Valley relies on the assumption of taking financial risks in order to reap the financial gain, but the experience of on-demand labourers is revealing of a contradictory ethos of what is alternately referred to as the gig, sharing, or on-demand economy. In interviews with platform workers, Alexandra Ravenelle found that many experienced the idea of a 'sharing economy' to be a misnomer, finding it to be suggestive of "trust, convenience and peer-to-peer collaboration" (Ravenelle, 2017, p. 6). These values seem at odds with the idea promoted by these companies of entrepreneurship as an individualistic pursuit, simultaneously emphasizing the freedom and autonomy of the individual and the aspirational goal of being one's own boss, although this self-employment can only be accessed through the use

of the platform. Ravenelle found that the use of these labels to define platform labour were reminiscent of the fluid and pragmatic use of the word 'platform' itself. However, through the emphasis on individual entrepreneurship, the rhetoric of risk and reward is "retooled to suit a contingent of lower-income workers who are recruited to perform service labor under working conditions controlled by the design and affordances" (Rosenblat and Stark, 2016, p. 3763) of the platforms.

A final note on algorithmic management and digital capitalism. In the effort to create digital technologies to manage a distributed labour force, companies not only create unstable conditions of work but also create opportunity for 'algorithmic cruelty' (Meyer, 2014). This refers to situations in which algorithmic governance unintentionally causes pain to the users of the digital system. A common example is a situation in which Facebook sends you a cheerful 'Happy Anniversary' reminder for a significant life event which might happen to be the death of a friend. Precisely the lack of attentiveness to context is a reminder of the limitations of automation. Gray and Suri (2019) find that the concept also applies to the organisation of labour for ghost workers. For instance, if a worker is blocked from accepting tasks due to a digital system error but is then penalised for a low daily task completion rate. They describe how the burdens caused by algorithmic cruelty can be mapped onto a scale like those used by doctors:

"In some cases, the burden is a mere annoyance, a minor paper cut. Those little cuts may look like time lost to seeking work and understanding the work. But other times, small annoyances can fester into a more painful situation, one that becomes a drain on a worker's time and energy." (Gray and Suri, 2019, p. 75)

On the lower end of the scale, they point out that what is promoted as flexibility by the platforms is experienced by workers as a stressful need to be hypervigilant to accept and complete tasks. Similarly, situations in which workers feel isolated and lack guidance from the company to understand the rules of their work, are presented as autonomy. Critically, issues in the system that lead to a loss of income or result in drivers trying to game the system are presented as malfeasance, legitimising the use of punitive measures.

Thus, the use of digital technology shifts not only the costs of production onto workers but also the risks and 'transaction costs' associated with each encounter with a new customer (Gray and Suri, 2019, p. 91). For on-demand labourers, whose work takes place behind a screen, the relation to the customer is one largely mediated through the technological interface. While much of the existing research explores how digital capitalism enables forms of exploitation through its reconfigurations of the labour force, less attention is paid to the personal encounters between the platform-designated service providers and service users. Although ride-hailing drivers engage

with customers through an interface, the nature of their work means that they must also engage with the real human in each encounter. Specifically, scrutiny should be given to how the physical presence of service providers and users is mediated through digital technology and how the app positions the transacting parties, with the consequent effects on the circulation of people, services, and money through the platform infrastructure.

Contributions of the Thesis

This thesis contributes to scholarly discussions about digital capitalism by examining the intersection of digital money and the infrastructures for organising distributed labour through digital platforms in Indonesia. I explore how the technologies deployed for labour management within these platforms influence the parallel circulation of both digital and cash money through the labour of drivers. I show how these companies privilege the use of digital payment over cash for their ecosystem of services, encouraging its use by transferring the transaction costs arising from cashless payments onto drivers. Thus, these companies extract value not just from the exploitation of driver labour, this labour also facilitates the generation of increased transactional metadata. Positioning themselves as the focal point for accessing services digitally, these companies not only control access to this data but also generate massive capital investments based on the promise of how they will revolutionise the digital economy. What they are selling, is a vision that is premised on advancing access to this version of a digital economy. In a context of great socio-economic inequality where many people do not have access to formal financial services, the promise of a simple technological solution to complex structural problems is both a compelling idea and an opportunity to engage new users on the digital platforms.

Firstly, I contribute to the literature on digital payment infrastructures in the form of Indonesian e-money, and its popularisation as an integrated payment method within ride-hailing platforms. These technologies have become increasingly prominent since 2017 in the form of smartphone apps, and in the limited literature are often studied from the perspective of factors affecting consumer acceptance (cf. Ferdiana and Darma, 2019; Susilo et al., 2019; Widayat et al., 2020; Widono et al., 2018). This thesis provides an important ethnographic contribution by focussing on how the use of such a system is experienced in practice. Particularly, because it emphasises the experiences of those users for whom engaging with these platforms is not a question of trust, acceptance, or even choice, as the digital payment system is an obligatory component of the work as 'driver-partner'.

To understand how the drivers experience living with these digital payment systems, this thesis explores how the dynamics of these ride-hailing platforms influence their engagement with the

digital payment system. Therefore, this thesis also contributes to the literature on the algorithmic management of labour: specifically, the growing body of literature that centres on experiences outside of a Western context, contributing to the particularisation of platform labour in Indonesia (cf. Ford and Honan, 2019, 2017; Nastiti, 2017; Qadri, 2020a, 2020b). To examine how these apps mobilise drivers in service of the digital payment system and thus the customers of the company, I conceptualise the fleet of ‘driver-partners’ as an extension of the digital infrastructure: enabling the physical circulation of goods, people, and money as a response to digital orders. By drawing on the concept of social infrastructure (Elyachar, 2010; Simone, 2004) I emphasise how the labour of drivers is devalued through the veneer of digital automation: expressed both in the language deployed by representatives of the app companies and through the visual language of the app interfaces that customers encounter. I argue that these apps benefit from existing socio-economic inequalities providing them with access to a constant supply of workers. Modelled on other forms of platform labour, these workers comprise a distributed workforce, and thus the technological innovation provided by these companies is the methods they deploy to manage drivers algorithmically. The digital infrastructure masks these difficult and exploitative working conditions, contributing to the exploitation of the labour of drivers, which is done in the interest of creating cheap and convenient services for customers. I argue that this infrastructural arrangement reinforces existing social hierarchies, positioning drivers in a role of servitude to those who can afford to pay others to do things for them.

The novel contribution of this thesis is in examining how these dynamics of labour organisation are used to mobilise drivers particularly in service of expanding the digital economy. When companies such as Gojek and Grab first introduced their apps, they were providing a digital interface through which customers could easily access drivers to provide on-demand services. With the introduction of digital payments, the role of driver-partner was reconfigured to include facilitation of the circulation of digital money: drivers became exchange agents between cash and company-issued digital credit but were also suddenly able to receive payment for their services with this credit. As these digital systems are being introduced in a context where the majority of the population still depends on cash for their daily economic needs, this digital system is premised on a parallel circulation of cash. Particularly, the ability of customers to make cashless payments relies on drivers being able to reconvert digital earnings into cash. In practice, this means that customers can use the digital payment system without having a bank account, whereas a bank account is a requirement for drivers. I argue that this type of money system unfairly burdens drivers with the resulting transaction costs of enabling the circulation of digital money within these platforms.

As these apps expand from transport and payment to providing a broader ecosystem of financial services, I show how they, and their investors, often leverage arguments of using digital financial technology to alleviate poverty through financial inclusion. These technologies will allow people to transact directly with digital money outside of formal financial institutions, a mechanism of transaction known as P2P payment. In this thesis, I examine how the concept of P2P evokes expectations of a non-hierarchical transaction, and show how in practice, the use of these digital wallets is heavily intermediated: from the way that cash is presented as an expensive payment option, to the way the contents of driver wallets are made available for customer top-ups. In practice, these platform companies exert great control over the conditions of exchange between transacting parties. Rather than configuring service users and service providers symmetrically, I argue that these apps contribute to the reproduction of social hierarchies, not only enrolling customers in the monitoring and reporting of drivers, but also by optimising the functionality of the system to serve customer needs. Thus, the idea of a 'hassle-free' digital payment relies on the displacement of that hassle onto those receiving the payment. Meanwhile, these service providers are forced to rely on the digital money system implemented by these companies and risk losing access to their digital savings, for instance, if their accounts are suspended as a consequence of algorithmic management. Thus, the concept of P2P obscures both how the conditions of exchange through these digital payment systems create transactional inequalities, but also the extent to which these companies exert influence over these conditions.

This thesis argues that the structure of this digital money system is premised on creating access to cheap and convenient services for customers because this is what drives engagement with the platform and generates value for the company. This affordability and convenience are assured through the structural exploitation of the drivers, whose labour enables the continued circulation of value. However, the concept of P2P payments, with its emphasis on the transactional relationship between the exchanging parties, also obscures that it is this constellation that is the product of the platforms. By ensuring cheap and convenient services, these companies continue to secure an increasing population of users within their specific platforms: the metaphorical castle with its moat of digital payments. As they continue to expand their services, especially with the emphasis on reaching those who are not already using conventional banks, these companies garner significant international attention and attract venture capital from those who wish to be a part of, and to benefit from, this 'revolution' of the digital economy. Thus, I argue, that we must engage critically with the type of peerhood that these companies purport to offer, and what form, terms, and conditions for 'inclusion' this technology is bringing into the world.

Chapter Overview

Following this introduction, I introduce the methods used in this research project. I present the methodological considerations that informed the research design, use of ethnographic methods, and case selection. I reflect on my use of ethnographic methods for studying digital phenomena and finally outline my ethical considerations.

Chapter 1, 'Configuring Peerhood' unpacks the concept of P2P payments, exploring the etymological origins of the word 'peer', and its practical and ideological meanings within network topologies. Drawing on literature from science and technology studies, I ask what the significance of peer-to-peer payments implies, as opposed to another phrasing – for instance, user-to-user – and suggest using the analytical lens of peerhood to examine the configuration of users through these digital payment apps. I explore how the phrase P2P, when used in the context of conventional digital payments, benefits from the social meanings implied by the term peer and P2P networks, while simultaneously obscuring the significance of the companies providing the intermediating infrastructures for financial transaction. Drawing on scholarship within economic anthropology, I explore the concept of digital payments and the concept of transactional communities to discuss the politics of payment, and the control exercised by these intermediating companies.

Chapter 2, 'Visions of a Cashless Indonesia' provides a broader contextual overview of digital payments in Indonesia. It explores how the infrastructures for communication and digital payment have converged into what is technically defined as 'e-money', and which has gained prominence through its integration as a payment mechanism in the popular ride-hailing apps Gojek and Grab. I further contextualise these developments with coinciding political momentum towards increased digitalisation in industry, as well as increased emphasis on 'financial inclusion' and a modern 'less-cash' society. I show how the labour of 'driver-partners' is presented as being integral to the emerging financial services offered by these apps, while also revealing how the app companies, their collaborators, and investors emphasise their importance in the push for 'financial inclusion' mediated by digital financial technologies.

Chapter 3, 'Servicing Consumer-Cyborgs' begins by interrogating this narrative of financial inclusion by examining its origins and the paradigm shifts that led to the global poor and so-called 'unbanked' to be perceived as an emerging market for the products and services offered by new fintech companies. These companies claim that their services, and particularly the transition away from cash towards cashless payments, will lead to increased personal income and financial growth on a broader level. I illustrate how the past years of economic development in Indonesia have led

to reduced poverty in Indonesia, while also contributing to increased wealth and income inequality. I demonstrate how these visions of a modern digital Indonesia are intimately connected to visions of an aspirational middle-class lifestyle, in which certain forms of consumption are considered constitutive of both more 'proper' economic subjects, and those by whom they are expected to be served. I go on to show how the fleets of driver-partners can be considered an extended social infrastructure of the digital payment apps, mobilised by the fintech companies in service of their customers: the imagined 'consumer-cyborgs' of the app.

Chapter 4, 'Hassle-Free Payments', explores the particular infrastructural mechanisms of these digital payment apps and how driver-partners, in particular, navigate these constraints in their role as exchange agents for customers. I examine how they are mobilised by the infrastructure to facilitate the circulation of value through the platform, and how they are positioned in these moments of exchange, relative to the app's customers, thus exploring the more relational aspects of a P2P transaction. I delve into the importance of being able to manoeuvre forms of value within the app and the requisite for drivers of being able to materialise these as cash. I end the chapter by examining how both drivers and customers act as human ATMs (Automated Teller Machine) in this exchange, and how the apps are designed to disadvantage drivers by prioritising the ease of access to digital money forms for the consumer-cyborg.

Chapter 5, 'Partners Who Never Meet' explores the perspective of the driver-partner, examining in more detail how they are mobilized in service of the consumer-cyborg through the algorithmic governance of the app. I show how these apps enrol their customers in the monitoring and exploitation of drivers, positioning them in a hierarchical relationship rather than as the equal parties in an exchange that is implied by the phrase P2P payment. I also explore the case of account vendors to show how transactional intermediation emerges even as advocates of P2P payments argue for the 'removal of the middle-man'; to the contrary, I uncover how these vendors control the digital wallets of connected drivers. Finally, I examine a case in which additional inequalities among driver-partners were introduced by major changes to the algorithmic management which resulted in further hierarchisation of this labour.

A final concluding chapter provides summaries of the arguments made in each chapter, before reviewing three of the central discussions emerging from the research concerning how the dynamics of the Indonesian ride-hailing apps affect the circulation of value and the conditions of exchange for transacting parties.

METHODOLOGY

Digital Payments in Yogyakarta

The idea for this research first emerged in early 2017, as conversations about cryptocurrency and blockchain grew to increased public awareness. One of the dominating narratives of the time was how this technology could be used to present an alternative to digital money, specifically in contexts where people were considered to be ‘underserved’ or excluded from formal financial services. Constituting a form of ‘quasi-bank account’ advocates suggested that cryptocurrencies could help provide ‘financial inclusion’ to the ‘unbanked’ (Scott, 2016). While cryptocurrencies theoretically constituted a more public alternative to other forms of mobile money, it seemed that many of these projects lacked serious reflection about the socio-economic and infrastructural contexts that such technology would operate in. In practice, they potentially disregarded both how people might access or make use of such technology, but also that structural problems such as economic inequality are not necessarily solved technologically (Morozov, 2014). Indeed, introducing such technology might exacerbate existing inequalities, or result in new dependencies turning technology companies into arbiters of access to the digital economy.

Hence, this project began with an interest in understanding how such blockchain technology might intersect with existing financial infrastructures, and I pursued it with a wish to complicate these existing narratives about the use of cryptocurrency as an alternative to commercial financial services. The research was funded in collaboration between the IT-University of Copenhagen and Southeast Asia based financial technology company, OmiseGO, which contributed a portion of the funding for the first two years of the project. OmiseGO expressed an interest in contributing to the project as a way of developing knowledge about the challenges and risks posed in the implementation of blockchain technology. This would involve developing a better understanding of how people engaged with and experienced existing commercial financial services. Their

involvement in the project primarily included input in setting the initial scope of the research, for instance, the decision to locate the research in Yogyakarta, Indonesia, and to focus largely on an urban population who were more likely to have existing experience with some form of digital payments. For the remaining duration of the collaboration, they were not involved in defining the research but were presented with findings from the research in the form of progress reports and presentations to their team. At no point in this research have they had access to any of the data that I have collected, been involved in any decisions regarding the continued development of the project or its analytical threads, nor have they in any way been involved in the production of this thesis.

Beginning this research, I initially experimented with how studying the use of existing digital payment infrastructures in Indonesia might provide a parallel way of studying cryptocurrency wallets. There is some ethnographic precedence for researching 'partially existing', or 'hybridizing' technologies (cf. Jensen, 2010; Pink et al., 2018). In the early period of this research, this approach seemed to provide a meaningful way of thinking about the use of what was still non-existent digital wallets for cryptocurrencies. Examining how people made sense of and formed technological hybrids with the existing infrastructure to meet their needs. To me, it emphasised the need to understand new technologies within an existing context, reiterating that any new digital payment system would not exist within a technological vacuum. Thus, I thought that this project would be about studying how people engaged with existing digital money technologies and the social infrastructures that enabled these systems to function.

My understanding of the research grew following an initial visit to Indonesia in March 2018. I was invited to visit the Anthropology Department of Universitas Gadjah Mada (UGM) in Yogyakarta, to establish a formal project collaboration as a part of their expanding research into e-commerce in Indonesia. This collaboration became an important component of the research. Especially interactions with my PhD colleague Agus Indiyanto helped provide critical reflection points for my findings, thus enriching my growing understanding of the case, but also helped to provide access to some interviews and conversations that I would not have been able to reach myself. As part of the collaboration, three of Indiyanto's bachelor students contributed as research assistants for select parts of the fieldwork. During this initial visit, I had the opportunity to conduct a preliminary mapping of the field, which came to inform the development of the research design. While in Yogyakarta, it became clear that while there were already several implementations of conventional digital payments, including technologies for peer-to-peer (P2P) transaction, the most dominant examples of digital wallets were GoPay and OVO. Integrated as the payment system of the popular ride-hailing apps Gojek and Grab, these technologies were some of the most

immediately recognisable forms of digital money.

Two early realisations made me decide to focus on these two iterations of a digital wallet. Firstly, for customers of the service, 'online transport' proved to be an easier starting point for conversation than talking about digital money. Not only did talking about money carry certain taboos, but I found that many people I spoke to felt that 'digital money' was itself an intimidating, technical category, and they would often express that they 'didn't know much about it'. Asking questions about their use of online transport, and then leading into questions about the integrated payment system was a much more successful strategy. Secondly, I realised that though customers might use a digital wallet only occasionally, perhaps without even reflecting on this use, the drivers who worked for these apps were forced to use them regularly as they depended on them to receive payments. As I learned more about their experiences, I became increasingly curious about how this digital system depended on the parallel circulation of digital and cash money, and about how much influence the companies providing these digital solutions were exerting influence over the conditions of the transaction. Thus, this became the premise for a case study on GoPay and Grab: to explore how the dynamics of these digital infrastructures were affecting the circulation of value, and how this digital system was experienced by its users.

A common criticism levelled at case studies is that one cannot make broad generalizations from a single case (Flyvbjerg, 2006; Yin, 2012). Indeed, one might ask what a study of drivers and digital wallets in Yogyakarta can tell us about the broader phenomena of digital payments in Indonesia. I would draw on Robert Stake (Stake, 2005, 1995) here, to argue that the value of a case study is not to make broad generalizations, but to refine them by illuminating particular problems or particular uses. Rather than defending the typicality of a case, Stake suggests that "The real business of a case study is particularization, not generalization" (Stake, 1995, p. 8). Throughout my fieldwork, it became increasingly clear that the so-called 'driver-partners' of these ride-hailing apps in Yogyakarta could be defined as an instrumental case for understanding the particular details of digital payments as implemented by GoPay and OVO. My reasoning for centring the experiences of drivers was based on a variety of specific characteristics that they shared as users of these digital payment systems:

- **The digital wallet is a central tool.** Unlike consumers for whom payments were a passing and occasional activity, drivers make use of their digital wallets every day in their work lives.
- **Point of contact for digital wallets.** As transport is a central activity for many people, the driver became the first point of contact with these novel digital wallets.
- **Bridge to digital money.** Drivers operate as agents of digital money and are financially incentivized to sell their digital credits to passengers in exchange for cash. Thus, they

present an important bridge to digital money for passengers by operating as 'human ATMs' (Maurer et al., 2013a).

- **Heterogeneous group.** Drivers are not a homogenous entity, representing a wide range of backgrounds, as well as varying degrees of control and ownership over their digital accounts, given mechanisms deployed by the platform, third party account vendors, and the trading and sharing of accounts. So, rather than convey a generalizable story, I seek to ensure variety in the experiences of drivers whose stories I convey.
- **Community and identity.** Where the individual user of a digital wallet may not identify strongly as being such, drivers have formed communities and culture around their function and identity as an online driver, in which digital payments has a central impact (cf. Qadri, 2020a).

Particularly, understanding the driver experience involves understanding how the apps affect people's lives: how algorithms affect livelihoods, how they affect the circulation and ownership of value, access to resources, and how their lived experience compares to broader theoretical conversations about peer-to-peer payments.

The study of drivers provides a central starting point to describe and interpret the particularities of the case, what Stake calls the 'artifacts of the functioning' of a case (Stake, 2005, p. 452). To do so, the researcher must seek out what is common and uncommon about a case, by drawing on its specific activities and 'functioning': its historical background, physical setting, economic, political, legal setting, and of course the interlocutors who can convey their knowledge about the case (Stake, 2005, p. 447). In other words, interpreting the various activities involved in the work of online drivers to explore the edges and intersections within the Indonesian digital payment ecosystem: interactions with customers, with various intermediaries, the platform companies, banking infrastructure, the regulatory framework, as well as the infrastructural, political, and socio-economic context. Each time new intersections emerged I would explore these too: gradually delineating the case and refining my focus to examine how the algorithmic management of labour mobilised drivers in service of the digital economy as manifested by the Indonesian platform companies. As Stake points out, while a quantitative survey may reveal broad impressions of the digital payments ecosystem, it is the particularistic study of a case that can bring attention to this interactivity of actors, activities and setting (Stake, 2005, p. 453).

I am not as such interested in Indonesia as a site of research or as a unit of analysis in any geographically bounded sense. It is worth remembering that this boundary is itself a remnant from the Dutch colonial era, and remains in flux, with violent repression of peoples in regions that seek independence. Any particular location will not be representative of many other potential sites of research. The interest I have in digital payments – the ways this technology travels and translates, how value circulates through the resulting infrastructures, and how that impacts upon existing socio-economic relationships – are all components "within a wider system of global

capitalism” (Hjorth and Khoo, 2016, p. 4): increased access to cheap smartphones in Indonesia is in part due to Chinese manufacturing, the technological premise of Gojek is modelled on apps such as Uber, originating in Silicon Valley. Thus, rather than try to capture something representatively ‘Indonesian’ across various field sites, I decided to select one location to conduct an in-depth study of the phenomena of digital payments within a specific context. After exploring several possible sites in Indonesia, I decided on the province Special Region of Yogyakarta (Daerah Istimewa Yogyakarta) and specifically the city of Yogyakarta, commonly referred to as Jogja. Jogja is characterized by a high level of infrastructural development, and a relatively diverse socio-cultural population, given the many universities in the city, which attract students from the entire country, many of whom eventually settle there. Yogyakarta has a population of over 3.8 million, and approximately 436,000 live in the city of Jogja itself (BPS, 2021). Though the case study is conducted in the city of Jogja, its immediate proximity to rural sites and its diverse socio-economic demography make it possible to encounter people with very different levels of access to financial and technological infrastructures.

Fieldwork

To study how the dynamics of ride-hailing apps affect the circulation of money, I employed an ethnographic approach. Thus, the empirical material that this thesis draws on is largely in the form of interviews as well as fieldnotes recording encounters with drivers, app customers, as well as between myself and the app. Empirical data collection took place during two rounds of fieldwork, each lasting about 3 months. The first took place between June-August 2018, and the second between February-May 2019. Drawing on a preliminary literature review, and the initial mapping of the field in March 2018, I identified the following list of potentially relevant interlocutors:²

- Service providers: drivers/payment recipients
- Service users: customers/passengers/and indirect users of conventional digital payment systems
- Digital money/digital wallet companies
- Indonesian blockchain community members/companies

Though I had developed the case beyond the use of cryptocurrency and blockchain, I had decided that it would still be relevant to examine how this technology was being approached by local actors, and so attended various local blockchain events, and even interviewed people who either had or were actively working to develop blockchain-based digital payments. To contextualise

² A full overview of all interlocutors can be found in appendix 1.

findings from my case study with drivers, I also reached out to various local experts and government institutions. Specifically, I was interested in getting a better understanding of the regulatory framework that these technologies operated under, and what the broader political agendas were for this field. Interviews with experts and government agencies helped me to identify relevant policies and pieces of legislation that were important to ground the case within its broader setting.

During my time in Jogja, I stayed in a *kost* close to the northern part of the ring road which encircles the city.³ Initially, I would spend my days walking around a lot, experimenting with any opportunities for using digital payments, and booking trips with drivers as a way to begin developing an understanding of the case through more informal conversation. The timing of my first visit coincided with the beginning of the public holidays for Ramadan, which meant for the first week or so many people had left the city to visit their families, and many shops were closed. I used this time to familiarise myself with my surroundings, to make observations about things like public advertisements for digital payments, and to prepare interview questions based on early conversations with drivers. The bulk of the data collection took the form of in-depth interviews with key interlocutors as well as focus group discussions, as well as fieldnotes collected from many shorter conversations particularly with drivers. Interviews were semi-structured and conducted in Bahasa Indonesia. Most of these were recorded digitally, following consent from the interlocutors, and others were recorded using written notes during the interview. Recorded interviews were later transcribed and translated into English to facilitate easier analysis. This was done both through the services of a professional transcription and translation company, and later one of the UGM research assistants who I contracted following the completion of her anthropology degree. In both cases, audio recordings were edited to remove any instances where the speakers mentioned their name, and these were subsequently shared using an encrypted email server, with an explicit agreement that the files be deleted upon completion.

For the first round of fieldwork in 2018, the bulk of interviews conducted was with drivers, as per the research design. In practice, I would meet drivers simply by booking trips using the online platforms. During the trip, I would introduce myself and my research, and depending on the responsiveness of the driver, ask some broad basic questions about their experience as an online driver using the digital payment system. It was important to me to exercise a great deal of sensitivity in these situations. I was essentially intruding upon drivers in their work environment and given my knowledge about how drivers depend on good customer ratings it was important to

³ A *kost* is a room for rent, typically targeting students.

be attentive to, and respectful of their boundaries. For the most part, it was my experience that drivers would be quite enthusiastic about sharing their experiences, and to have someone external listen to and try to understand the issues they were facing. If during a trip, I felt that I had developed a good rapport with a driver, I would invite them to participate in an extended interview at a time and location of their convenience. The nature of this recruitment method meant that I engaged with a broad spread of interlocutors: speaking with drivers originating from Sumatra to Sumba, drivers who were retired bank employees now driving to support their grandchildren, and drivers borrowing accounts who slept at gas stations to make ends meet. While many of their experiences reflected a shared understanding of the governing mechanisms of the platform they were working under, it quickly became clear that how the effects of these mechanisms were experienced in practice varied greatly depending on the specific circumstances of each driver. For some driving was a hobby, an opportunity to meet new people and earn some extra money, and for others, it was a precarious full-time job. As I would later understand, not only were these experiences a reflection of existing socio-economic circumstances, but also a reflection of the way a driver was accessing the app, and the condition of their account based on the long-term effects of algorithmic management. In this thesis, I draw mainly on the experiences of car drivers, in part due to the initial ease of accessing interviews, but also because there are events and infrastructural designs that make the car drivers a particularly interesting case for the circulation of money, as I will detail in the rest of the thesis.

In 2019, having now developed a better understanding of the case, I decided to focus more specifically on interviews with services users. Determining what customers to speak with, or even what might constitute a 'regular user' proved more challenging. When asking drivers about their regular customers, many often pointed to Jogja's large student population, and thus as a starting point, and in coordination with my colleagues at UGM, we disseminated an announcement about focus group discussions regarding digital payments through various student WhatsApp groups. There were many reasons for choosing first the format of a focus group discussion, one of which was that it would be a way to recruit interlocutors for individual follow-up interviews. By starting with focus groups, rather than individual interviews, I hoped to get a better understanding of how various groups talked about and understood digital payments, to minimize the imposition of my own language and understanding. Throughout the discussions, participants would supplement one another, contextualising or reflecting on one another's experiences as they "co-construct messages and meanings" (Marková et al., 2007, p. 202). In this way, the focus groups allowed participants to draw out specific complexities and contradictions that might otherwise be invisible (Kamberelis and Dimitriadis, 2013). Reviewing these discussions later, these interviews

provided important nuance in my analysis, as the participants would raise issues, or connect topics that had not seemed immediately related to me at first. Examples of this included subtle social perceptions about users and non-users of different forms of digital payment, the practicalities and inequalities related to access and use of technological hardware, or the centrality of the ability to convert digital money into cash.

Once again, following the contextual clues provided in these interviews I continued this method with other groups, reaching out through my growing local network to recruit participants. In these cases, I prioritised forming groups with people who were already previously acquainted and who shared some form of connection. For example, I interviewed a group of women who knew each other from their religious study group, and a group of technically ‘unbanked’ women who were part of the same peer-to-peer lending group, and eventually also a group of drivers who were all previously friends. In total, I completed 7 focus group discussions with a total of 27 interlocutors with age differences ranging from 18 to 58. They demonstrated widely different understandings, expectations, experiences, and opinions of the technology we discussed which provided much more depth to my understanding of the case. Once again, after each discussion, I was able to recruit people for follow up in-depth interviews.



Figure 1: Arrangement of picture cards following a focus group discussion.

Each focus group discussion was structured similarly, with similar questions, though in each case adapted to the context of the specific group. Before beginning the question portion of the

discussion, I presented the participants with a variety of picture cards. Facedown, they took turns picking a card, describing what they saw, and then the group would collectively share what the picture made them think of. The same 9 pictures were used in each group and included images such as debit card readers, an ATM, a Gojek driver, and so on. This process was a useful icebreaker, but also helped to frame the discussion since it provided visual context for what was meant by 'digital payment', something that could otherwise be quite an abstract category. Images were selected based on what I had learned in the first year, representing various items and situations people would associate with this abstract concept. After the discussion, I would bring out the pictures again, together with various cards showing logos from common digital payment platforms. I would then ask the interlocutors to sort images and logos according to how often they used them, ranging from daily to never. Interlocutors would then work together to sort the pictures, leading to a few interesting discussions about the practical use of certain things and chiding remarks for instance about the low balance depicted on the ATM screen. Once again, this was interesting additional data, and each final sorting was photographed. For the interlocutors, it also served as a more light-hearted and fun collaborative exercise to end the session with.

Besides these more formally organised interviews, I would also have casual conversations with people I met during my daily activities in Jogja. Street vendors from the neighbourhood who would invite me to sit down and chat, friends I would meet for coffee, and the women from the local aerobics group I joined all provided me with input and insights about digital payments. Sometimes I might observe them interacting with drivers through the apps, or otherwise gossiping about previous encounters.

I also interviewed representatives from 8 of the main fintech companies operating in Indonesia. My experience here was that everyone I contacted was happy to meet. The difficulty was in figuring out who to speak with, as most of these company websites do not have a list of employees on their websites. In some cases, the connection was facilitated through existing contacts, but I also found that it was possible to search for the companies using LinkedIn. This would give me a list of people noted as working with a specific company and allowed me to find the person in the most relevant position for me to talk with. I could then research them to see if they appeared in other media in relation to the company, confirming that I had identified the correct person, and then find a public email address or WhatsApp number to request an interview. This proved a surprisingly simple and effective way to reach leading actors in the Indonesian tech sector. These interviews always roughly revolved around four themes: 1) the historical development of the company, specifically in relation to expanding financial services, 2) approach (if any) to a more rural or 'unbanked' population, 3) the infrastructural arrangements of their technology, for

instance in terms of topping-up and cashing-out, quick response (QR) codes, or collaborations with external parties, and 4) perspectives on the regulatory environment and expectations for the future.

Supplementing these interviews are an extensive collection of fieldnotes generated from both direct and participant observations of encounters related to digital payments. The form and content vary depending on the type of encounter. The majority of these notes are of meetings with drivers lasting just the duration of the trip booked through the app. In practice, I would enter the vehicle, and after having introduced myself and my research, visibly jot down quick notes, keywords, or quotes using my phone. For these encounters, I would generally have a set of topics in mind that I could use to generate conversation, but as mentioned earlier, I generally tried to let the driver steer both the content and pace of the conversation as a way of respecting their boundaries. For these notes, I would record details from the conversation, including how the driver was communicating: such as specific intonations or gestures. I would also take note of the physical environment, noting where the driver had placed the phone, and how they interacted with the app, and other apps for that matter, while we were driving. This gave me insights into how the driver app was set up, or how their version of transactions such as 'top-ups' worked, which allowed me to ask more detailed questions in interviews. I would also record any unfamiliar driver vernacular, such as when drivers used contracted words like *tupo*, meaning *tutup poin*, or to 'close the points', following up either in the moment or with other drivers to understand the meaning. After exiting the vehicle, I would pause to flesh out the notes on the phone with as much detail as possible including the context of the encounter. Later in the day, I would typically write up the collection of daily notes into full fieldnotes, where I would also try to relate emerging topics with previous experiences, including writing separate memos to myself of insights I was making along the way. Each month I would compile key findings into a field report that I would share with my supervisor. This proved a valuable practice, forcing me early to focus on emerging patterns and to clarify details so that they could be shared. This process helped me in the process of defining the case more clearly, but the reports themselves also proved an evocative way of refreshing my memory of the field months later when writing about these experiences from Copenhagen.

This research has been characterised by an iterative process of data collection and analysis, developing themes and analytical categories while in the field through memos and field reports, and more intensively between field visits through the development of conference papers. This allowed me to conduct a more targeted data collection during the second visit, further exploring the 'edges' of my categories. As fieldwork progressed, my sensitivity about what to record also

changed, as my understanding of the field and familiarity with the vernacular grew. Towards the end of my fieldwork, I used these occasions in cars with drivers largely to double-check my findings and nuance the themes I had already identified. I was able to ask more exact questions, for instance about vendors or the incentive bonus system, and then see how the experiences of each driver compared with my existing interpretations. Thus, I had already begun to process the material before completing the fieldwork. Upon returning home, I organised all interview transcripts and fieldnotes using software for qualitative data analysis (specifically NVivo). Reviewing my material once again, I used codes to organise my thinking, later revisiting the material and recoding encounters into broader categories as the central themes of the case became clearer to me. For example, this is how I came to understand the role of account vendors. In every single interview and field encounter, vendors barely made an appearance. However, coding all of these snippets, and identifying situations where drivers were talking about vendors, but using different vocabulary, allowed me to piece together their role. This collection of driver experiences provided a critical sounding board to the single interview that I was able to conduct with two vendor employees.

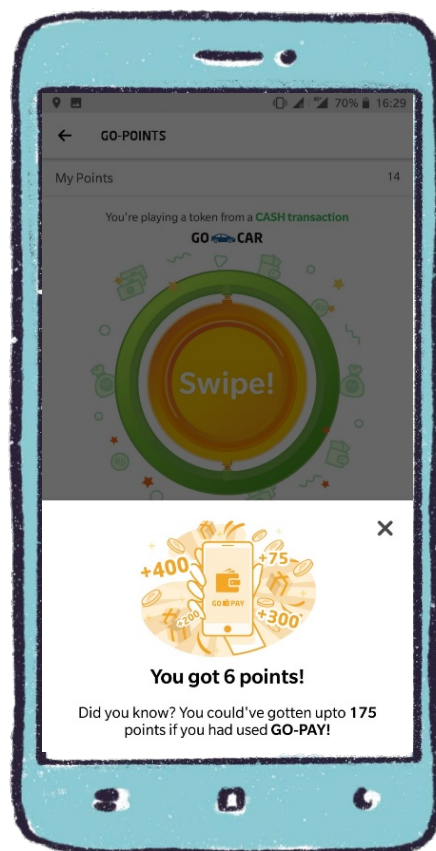
Supplementing this material, I also recorded photographs of relevant situations or tools, as well as screenshots to document my encounters with the app interfaces. I do not include any photographs depicting identifiable people in this thesis, or any other publication outside of the control of those depicted. My experience in Jogja was that people were constantly taking photographs with their phones and sharing these using social media. I even encountered a picture of myself being circulated in this way. Though people would frequently encourage me to take photographs of themselves, or together with me, I found that it was very difficult to communicate effectively about consent regarding the use of such images for an academic publication. Instead, I commissioned the Indonesian comic artist Nadiyah Rizki S to create a series of illustrations for the thesis. The use of comics, rather than photographs, also makes it possible to communicate visually more abstract concepts, and better captures the *feeling* of working for these apps. For instance, I can share a photograph of a driver's hand, holding a phone which shows the daily incentive bonus screen, but this photograph does not communicate the anxieties experienced with racing the clock to 'close the points' or of achieving a good customer rating. Furthermore, this illustrated medium helps to provide a sense of place for those readers of the thesis who have not had the opportunity to visit Jogja. I intend to compile these illustrations together with a more accessible account of the findings of this research in Indonesian, to communicate them to the drivers who took the time to participate in interviews and share their stories with me.

Digital Methods for Digital Payments

Though it seems strange in retrospect, initially, I had not considered the apps as being central to my research. I thought of them as a tool my interlocutors used, and which I would familiarize myself with so that I would be able to discuss it with them. However, throughout my fieldwork, I spontaneously started collecting screenshots as documentation of the encounters between myself and the apps I was using. For instance, on one particular afternoon during my fieldwork, I was standing by the road in the sun, feeling annoyed. The Gojek app had awarded me a token for completing a transaction, and I watched it 'spin' in the app until it landed on 6 GoPoints. A message immediately popped up telling me "Did you know? You could've gotten up to 175 points if you had used Go-Pay!" At the time, I was subconsciously working towards the 2,500 points required for an official Gojek t-shirt, and the distance between 6 and 175 points felt steep. Of course, I should know better, right? Even if I had opted not to pay in cash, the app algorithms likely would not have given me 175 points. I felt annoyed because I was being so blatantly manipulated; by the app and its designers, successfully encouraging me into channelling more digital payments through it.

Occasionally I would also receive screenshots from interlocutors wanting to show me certain mechanisms that I did not have access to as a customer. During interviews, drivers would inevitably take out their phones to give me a more visual understanding of what they were describing. While I did not initially know what to do with these screenshots, it seemed clear that there was important information to be gathered from and about the app itself.

During an interview, I (somewhat naively) asked one of the industry representatives about what opportunities there might be to access their quantitative data to learn more about the demographic composition of their users and drivers. He was very supportive, stressing their willingness to collaborate with researchers, and assured me he would send me the necessary materials. The next day, I received an email containing an infographic and realized this was probably going to be a dead end. Light et al. point out that "As relatively closed technical systems, apps pose new methodological challenges for sociocultural digital media research" (Light et al.,



Screenshot 2: Swiping for points with Gojek. 27 July 2018.

2018, p. 881). With apps taking over important social infrastructures such as the circulation of money, novel ways of navigating the research affordances of these digital platforms must be developed (Dieter et al., 2018). In his call for the development of critical digital methods, Christian Fuchs (2019) critically addresses what he calls digital positivism; namely the increased emphasis on a quantitative analysis of society, as viewed through big data. Instead, he argues, critical digital methods should strive not just to understand “the logic of data, but also how humans experience data and digital society.” (Fuchs, 2019, p. 13). I wanted to find a way to incorporate digital material into my qualitative analysis and thus I explored a variety of options for studying the Indonesian online transport apps. One example was considering the customer reviews in the app stores as a source of data, as I found that they both convey user expectations and concerns. For example, this user, who describes an important mechanism failure (Google Play Store, 2019):

I can't even log in to my account because I lost my phone number. At least give an option to log in with e-mail so users can recover their account.

September 3, 2019, 1 star

Or this user, who describes how she would like to be using the app:

Good. Hope to be able to book 2 locations in the same trip. Eg first to drop a child at location A and then continue to travel to work place at location B.

October 26, 2019, 5 stars

Or this user, directing attention to the infrastructural challenges of a digital payment system:

GOPAY top-up from mobile banking failed with no information, also terrible customer support. The problem: Trying to topup from Mandiri Mobile Banking, Mandiri said succesful with balance being cut, but NOTHING happened on Gojek app. The customer support: On weekend: Do NOTHING; On weekday: Told us to wait two working days and thats it. Multiple people are experiencing this on around this weekend (2019/07/13) based on social network complaints.

July 15, 2019, 1 star

Or this user, puncturing the idea of the app as a neutral sharing economy platform:

Good Apps with bad culture of the driver/rider. Many wrong plates, bad quality of ride/car. Massive protest action that make public uncomfortable. Wish company pay attention more to the quality of service and rules and strict with it.

September 24, 2019, 3 stars

Like my ad-hock screenshots, these excerpts felt like significant pieces of information but were lacking a rigorous framework for consistent analysis. I realised that what motivated me to analyse the app itself, was the realisation that it was leading me to make certain decisions and take certain

actions with regard to my transactions. In her piece on the ethnography of infrastructure, Susan Leigh Star (1999) calls for an ethnographic method for the study of infrastructure, that which might be considered boring or in the background, but which impacts our every day in sometimes invisible yet impactful ways. Specifically, she emphasises the possibility of identifying ‘master narratives’ which assert dominant or prevailing norms, and which become ‘encoded’ in the infrastructure. I wanted to get *beyond* the question of how people experience data and digital society, to understand how the intentions of developers themselves materialised in the infrastructures and interfaces to affect those experiences: these app mechanisms shape behaviours whether the developer intends them to or not. In their ‘walkthrough method’ Light et al. draw inspiration from Star, as well as the method of walkthroughs used by gamers to convey game intricacies, to develop a “rigorous and systematic study of apps” (Light et al., 2018, p. 882). By interrogating the ‘invisible infrastructures’ and the subtle ‘culturally embedded references’, they argue that one can make visible these master narratives. In my case, this method offered a more rigorous approach to analysing how the app companies communicated about the use of digital money to their users, for instance by reminding purchases made using cash were worth less points. Moreover, I found that this led me to pay more attention to the range of possible actions within the app environment, especially in transactions with drivers, as a way of generating insights about how the infrastructural design of the app contributed to the parameters for the circulation of money. I later discovered that drivers were actively sharing videos on YouTube showing for instance how to complete a top-up or explaining how the point system worked.⁴

In retrospect, it would have been impossible to fully understand how drivers experienced living with these digital payment systems if they had not shared their screenshots, or insisted on ‘walking me through’ their version of the app. Between the two rounds of fieldwork, I recorded over 1,000 screenshots as a way to document specific features or dynamics I was noticing as I used the apps, some of which are included in this thesis to illustrate specific examples. In each case, I have included which app the screenshot is from and the date that it was recorded. These visual environments change rapidly, even during the time of my fieldwork, developments which have also been reflective of the overall transition of these apps from transport service to the increasing emphasis on financial services. During fieldwork, I would alternate between using the apps in English and in Indonesian, both as a way to familiarise myself with the specific language of the apps, but my interpretations were not distorted through an English version of the app. I

⁴ See for instance this tutorial on how to complete a top-up as a Grab driver:
https://www.youtube.com/watch?v=wHo65z3soqo&ab_channel=ZonaTutorial

have tried to use examples I have documented using the English version for ease of communication in this thesis, but on the occasions where the example is in Indonesian, I will provide translations as necessary.

Finally, the increasing presence of the apps themselves in my research brought new challenges, as the technology is not stable. Of course, no technology is ever really stable, but the rapidity of these changes as they take place in this digital environment makes it very difficult to investigate. The mechanisms, affordances, and thus experiences of using them are constantly in flux. At times findings felt almost like sand corns trickling through my fingers as I desperately reached for freshly updated scoops of information. In practice, I would find within a period of just a few months, the details that informants had shared with me would no longer be accurate. This made it very difficult to pinpoint very specific details about the app, such as the exact number of points required for a specific bonus level, or how much a driver would be rewarded for selling their digital balance. It is an integral characteristic of these apps that the companies are constantly developing, innovating, improving, optimising (cf. Irani, 2019). During fieldwork, I found that drivers too were frequently updating or informing one another about the 'correct' information. Sometimes, drivers would interject in the middle of interviews or ask me to confirm if something correlated with what I might have heard from others. We were all constantly trying to figure 'it', 'the system' out, and adjust our collective knowledge with each app update (cf. Holmes and Marcus, 2020). Thus, when I do refer to any specific numbers or other details throughout the thesis, it will typically be exactly as communicated to me by an informant, verified to the extent possible across different interviews and with relevant context. For the most part, these specifics are less interesting, as compared to how users who depend on these apps for their livelihood experience, understand and navigate the constant changes.

Ethical Research and Platform Labour

Researching the so-called 'gig economy' and involving people who are engaged as on-demand labourers introduces specific ethical considerations, which have to do both with how knowledge about this industry is produced, and how to protect those who contribute both as individuals and as a collective group. In 2020, researchers across different disciplines wrote an open letter in response to the publication of academic research funded and used by these same platform companies to lobby for favourable regulatory environments (Gigeconomyresearchersunited, 2020). In this letter, the researchers proposed three principles for ethical research of on-demand labour addressing: 1) how to engage with the platform companies in terms of data collection and analysis, 2) the responsibility of the researcher to engage critically with how risk is allocated

between companies and labourers, and 3) that ethical research on the gig economy must protect its workers and not undermine them in relation to the companies. While these principles were formulated after I had completed my fieldwork, they reflect many of the concerns and considerations that informed my conduct during fieldwork.

The first principle specifically addresses situations in which research is conducted in such a way that the platform company itself provides data for analysis, or in other ways exerts influence over the analysis. I have not had any collaborations with the Indonesian fintech companies outside of the interviews I conducted with their representatives, thus they have not exercised any control over the collection of data, parameters for analysis, or the writing of my findings. As described earlier, I did enquire with one company about the possibility of accessing quantitative data and quickly realised that any data they could provide would be highly curated. Thus, the only material used in this thesis stemming from these companies is from the interviews themselves, and I would like briefly to reflect on how I navigated the information they provided and how I have chosen to represent this information in the thesis.

As described earlier, the emphasis of these interviews was on getting the company point of view on matters relating to the digital payment infrastructure, thus I am in no way relying on them to provide a reliable account of the conditions experienced by drivers. In a few instances, companies would either request to see my questions before meeting or ask to begin the interview by hearing which questions I intended to ask. In one instance this resulted in a company ceasing to respond to my emails, but overall, none of the representatives expressed any concerns or reservations. These interviews mainly served to help me expand my technical understanding of the system and the broader context of digital money in Indonesia. There are occasions where a particularly illuminating point of view or technical explanation are reproduced in the thesis when it serves as a relevant example. However, as you will see, I deliberately avoid connecting specific remarks to a specific company. I made this decision after realising how interconnected the people in this industry are. During these interviews, I found that many of the representatives knew each other, and had worked for each other's respective companies. Thus, for the sake of protecting their identities, in the few instances where I refer directly to something shared with me in these interviews these are attributed generically to an 'industry representative'.⁵ Again, my purpose with these interviews has not been to provide a channel for communication for these companies and nothing they have shared has been allowed to stand alone without critical analysis in relation

⁵ The full list of participating companies can be seen in appendix 1.

to the broader case.

As disclosed at the beginning of this chapter, I was partially funded by a fintech company called OmiseGO. As mentioned, this company has no relation to the case and has not been the object of study. My collaboration with them took place during the first two years of the research, during which the company was involved in the very early process of developing a research design. To reiterate, they were never involved in the empirical data collection or analysis, nor have they had any involvement in the writing of this thesis.

The second principle emphasises that researchers must not misrepresent the working conditions and opportunities for income available to on-demand labourers. They should “illuminate how risks – especially financial and legal risks – are allocated, accumulated and navigated” (Gigeconomyresearchersunited, 2020). In practice this means that researchers must be careful, for example, when calculating the possible hourly pay for drivers, reflecting what is considered ‘working hours’ and whether this pay includes unreliable sources of income such as customer tips or daily bonuses.

One of the primary purposes of this research has been to particularise how the mechanisms deployed by the Indonesian ride-hailing companies influence the circulation of value. Thus, this thesis goes into great detail to examine the intricacies of how drivers earn money, including their dependence on daily bonuses, and how the algorithmic management introduces differential valuation of their labour by rewarding drivers deemed ‘productive’ and reducing income opportunities for others. Through this work, I develop a deeper understanding of how these companies deploy mechanisms that unfairly burden the drivers with the costs and risks of servicing the customers of the platform. Furthermore, this work draws attention to new perspectives of how these systems benefit from and exploit the labour of drivers in the service of the ‘digital economy’. In examining the intersections of on-demand labour and digital payments, I have shown that the payment mechanisms deployed in these platforms can lead to further burdening platform labourers with the transactional costs of facilitating a ‘cashless’ payment system.

The third principle states that researchers must be attentive to how their research could have negative impacts on those labouring for these platforms, specifically in their attempts to organise collective action or to unionise. In practice, this means not undermining drivers in their efforts to negotiate better conditions for instance by legitimising income calculations that do not include fixed costs of driving. It is the companies that make decisions about how drivers will be financially compensated for their labour, and it is the companies that define the terms and conditions of their

work. Ultimately it is the companies that are responsible for their working force and it is they who must be held accountable.

Related to the preceding principle, most of my research has focused on identifying the ways that these companies benefit and extract value from the labour of drivers. In my work, I stress a holistic understanding of how drivers earn a living on these platforms and consider a number of ways in which the financial compensation for drivers is unjust. I have been particularly interested in identifying the ways that this exploitation takes place through differentiated compensation of labour, and how this is justified through algorithms that assess whether a driver has previously been sufficiently 'productive'. Thus, I believe my work is in alignment with these principles for ethical research on the gig economy. Related to this last point though, I would like to introduce a new consideration, particularly for those researchers whose work relies on the time of interlocutors.

Discussions about how to engage with, or compensate, interlocutors or research participants is a complex one, and not necessarily one with a distinct and clear answer. When I interviewed drivers, I would always do so in a place where we could order food and beverages and where I would pay for all expenses. On three occasions I also chose to compensate drivers financially for their time. The first occasion was in 2018 when the head of a driver community offered to take me to several base camps for the day, in which case the compensation was for both fuel and his time spent not working. I also chose to provide a contribution to the community fund collection for a new basecamp which was due for construction. However, in 2019, the integrated incentive mechanisms of the driver apps changed in such a way that the effect of not working for any number of hours could potentially compound for up to two weeks. These are the mechanisms leading to differentiated compensation of labour mentioned above, which will be discussed in detail in chapter 5. Briefly, these mechanisms meant the bonus that a driver could reach each day was determined by the number of trips completed over the past 2 weeks. Asking drivers to participate in an interview was no longer just a question of someone taking an hour or two out of their day, which was already difficult for a gig economy worker. Now, the effect of those hours might result in reduced income for several weeks. In the two instances where I interviewed drivers following this change, I decided that it was important to mitigate some of this possible damage by providing them with financial compensation for their time. Exactly how researchers should navigate such a situation is not clearly defined for me, and ultimately, my decision emerged in correspondence with the drivers themselves. For researchers of the so-called 'gig economy', mechanisms like this, which compound the effect of not working beyond the moment of an interview itself introduces new challenges and ethical considerations about the algorithmic

damage that our work can cause to our interlocutors. I do not have an answer, but I believe this warrants further discussion beyond this thesis.

My most immediate concern through data collection has always been to ensure that I do not cause any additional risk for the drivers that shared their experiences with me. While I had concerns about protecting the privacy of all my interlocutors, it was drivers who were the most precariously positioned. In many cases, they shared stories confirming that they were violating the terms and services of their apps, and thus placing trust in me not to expose them. To protect my interlocutors, all interview recordings and transcripts have been pseudonymised, with any identifiable information stored in a separate paper notebook along with their respective pseudonyms. I use quotes from both interviews and fieldnotes throughout the thesis to provide illustrative examples of the themes I discuss. Quotes taken from interviews are simply attributed in order of their appearance as Interlocutor 1, or Interlocutor 2, specifying in the text if the person is a driver, customer, or something else. Similarly, all screenshots depicted in the thesis have been edited to remove personally identifiable information, while still retaining the layout and types of information, that are depicted in the apps.

It is important to note here, that my background and upbringing in both rural and urban Indonesia play a major role in how I approach and understand the field. That upbringing has been formative to my understanding of the world, my intuitions, and my sensitivities. It has made Indonesia, as a place, feel familiar and relatable in ways that can at times be helpful and indeed bridge cultural gaps. At other times, it can be deceptive, leading to an exaggerated sense of contextual understanding. I was reminded of this one day during fieldwork in 2018, where I was sitting in a car, driving towards the UGM campus, when the driver asked me where I had learned to speak Indonesian. In a self-conscious effort to distinguish myself from 'other foreigners', I recounted my childhood, first in Sumatra and then Java. "Incredible," the driver responded with a smile, "I've never left Jogja." In my clumsy effort to create rapport and establish some mutual connection with this driver, I had revealed my own privileges and entitlements as a foreign white woman, and just how far apart our experiences were. While I might feel like I am familiar with some local mannerisms and colloquialisms, I am not Indonesian, and I retain and represent a very privileged position relative to most of my interlocutors. In Jogja, as a foreigner, I could go almost anywhere without my presence being questioned, and if questioned, usually out of friendly curiosity.

There are more intersections at play here as well, namely questions of class and gender. In my interviews with drivers, in particular, I have strived to meet them in a context where we were both professionals: where I am doing my job, interviewing them, as experts on their job, hoping to even the relationships between interviewer and interlocutor. However, at one stage of my

research, I was coordinating with an interlocutor to set up a focus group with some drivers, all of whom were men. Finding a viable location proved difficult. I could not, as a woman, invite them to my home at the *kost*. I could not invite them to a café or food stall, as we would not be able to speak privately: from experience I knew my presence there with them would draw excessive attention. Finally, in a last-minute decision, I invited them to the UGM campus, where I had the option of booking a meeting room. Knowing my interlocutor, I realised that this location would drastically increase the distance between myself and the drivers, who were clearly uncomfortable in this academic environment where dress and demeanour made them stand out. It was not an optimal solution, and even though we all gradually relaxed during the interview, I still regret putting my interlocutors in that position. In other situations, I found that my presence as a white woman directly hindered my ability to conduct research. For instance, I found that people would often disturb interview situations to take photographs, in one instance to the point of someone surprising me while I was interviewing another person by grabbing me from behind and having their picture taken. There were also times where drivers would disrespect my boundaries to the point of sexual harassment, meaning that there were opportunities for interviews or field encounters that I ultimately had to decline because I felt unsafe.

However, in the vast majority of cases I was treated with great respect, and I still ultimately benefit from the structures in society that privilege people who like me, are white, cis-and hetero presenting, able-bodied and wealthy in a global context. As the driver inadvertently pointed out to me, they are the very reason that I was able to be in a Jogja conducting research, where others cannot. Naturally, these factors influence the data collection process, relationships built with interlocutors, analytical decisions and impose limitations on my ability to understand the conditions as they are experienced by my Indonesian interlocutors. I have tried to be mindful of this throughout my research process, so as not to assume or assert that mine is an objective or universal knowledge. I have recorded memos of my reflections throughout fieldwork, conferred with my colleagues at UGM, and of course, continuously checked my perceptions through conversations with interlocutors. What I can offer in this thesis will always be a 'partial perspective' (Haraway, 1988) which both draws on and is limited by my particular positionalities. I hope it will be one among many, together contributing to building our collective understandings of the conditions for on-demand labourers and their role in the circulation of value.

1.1 Introduction

Originally a technical term, peer-to-peer (P2P) describes a technological infrastructure where two computer systems connect and share files without requiring a central server. The phrase P2P is now seeing an increasing use within emerging financial technologies to describe a wide variety of complex socio-economic transactions. The peers have become people and the integer '2' signifies an intermediary technology at the centre of facilitating an economic exchange. Keith Hart observed that a "lot more circulates with money than the goods and services it buys. Money conveys meanings and these tell us how we make the communities we live in" (Hart, 2007, p. 15). The exchange of digital money comprises far more than a simple financial transaction and far more than what can be summarized in an elegant acronym. While the notion of a peer is typically deployed to invoke images of equality or socio-economic alignment, what does peerhood mean when the term P2P is used to describe services and technology ranging from ride-sharing apps, international remittances and blockchain?

In this chapter, I explore the central dynamic of peer-to-peer (P2P) payments and show how the phrase is used to describe two very different underlying infrastructures of digital money. To do this, I unpack the P2P acronym beginning with the word peer itself. By establishing the social meaning evoked by the term, I further touch upon the role of intermediaries by examining the dynamics involved within a P2P exchange. Through this, I ask what social meaning the use of the phrase peer-to-peer has compared to how user-to-user might define the transaction. I draw on literature from science and technology studies (STS) to ask how we might use the concept of peerhood, the condition of being a peer, as a lens for examining how these payment apps configure exchanging parties into certain transactional relationships. How these same users form their own configurations and enact their own versions of peerhood. Finally, I examine the technical origins

of the phrase P2P and show how the allure of the language surrounding concepts such as decentralisation can obscure underlying power dynamics. I use this to argue that the use of the term peer in mainstream digital wallets draws attention away from the centralised control that the companies exert over the transactions, as well as the inequalities emerging from the relational dynamics imposed on the exchanging parties.

In the second section, I turn to the concept of the digital transaction and how these types of digital payment apps can be conceptualised as forms of technology of accounting, drawing on literature from economic anthropology to show how money can be understood as tokenised debt. I examine how digitalisation of these accounts centralises control with the private companies facilitating transactions allowing for an unprecedented data accumulation about these transactions and the people making them. I briefly examine how cryptocurrency emerged as a response to concerns about this increasing centralisation and privatisation of payment networks. I also show how these same ambitions are challenged by the practicalities of implementation and growing ideological divisions within the community. This indicates that even within the P2P-in-the-context-of-cryptocurrency community there may still be some peers that are more equal than others. I draw here on Lana Swartz's (2018) argument that the politics of money is not simply an economic question but one of communication politics. For example, how the increasing recentralisation of the internet, our payment infrastructures and their respective transactional communities is centralising control over our transactions in the apps of a few private actors. These apps can exert control over the conditions of the transactions taking place through their platforms, possibly exacerbating existing inequalities, or perhaps stimulating a more equitable or inclusive form of exchange as our evoked understanding of the phrase peer-to-peer.

1.2 The Meaning of Peerhood

To begin, let me describe an advertisement from my case which was released by the Indonesian company Gojek in 2016. I will provide a more substantial introduction to Gojek and its main competitors in the next chapter, but for now, I want to use this advertisement to introduce some of the central characters of P2P payments in Indonesia.⁶

A young girl is asking her mother if she will be home in time to break the fast for Ramadan that evening. Donning her distinctly green Gojek helmet, the mother gives her 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's hot, she's tired, and all these customers are cranky and rude. Her final passenger is

⁶ Viewable at: https://www.youtube.com/watch?v=u_OHKHSq8s

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, apologizing because they cannot be together. The reason, she explains, is that mom needs to make sure everyone else gets home in time to celebrate. Finally, alone on her motorcycle and having her first drink of water, the mother receives several messages, as customers send grateful thanks and positive ratings through the app platform.

Firstly, this advertisement presents the imagined participants in the exchange as two overarching categories of user for the platform: the service provider and the service customer. Secondly, besides the green helmet, the company itself is hardly present. The app's role as an intermediary of the exchange only becomes apparent towards the end when the phone makes its first appearance. Instead, the advertisement emphasizes how the users are social equals who are helping each other out in an important socio-cultural and religious event. What it does not emphasize is the precarity of the 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.

Throughout my fieldwork, I became increasingly interested in the relational exchange dynamics implemented through the infrastructure of apps like Gojek, and how these were experienced by users of the Indonesian digital wallets. Though Gojek does not market its integrated digital wallet, GoPay, as a P2P payment service, it, and other apps like it, are often referred to as such in media and scholarship on the topic. This label is premised on the idea that the GoPay service allows you to make a direct transaction to another person without having to go through a bank. A definition of the phrase P2P that differs from its original use. In the following sections, I first examine the concept of peer itself to determine its deeper social meaning. I proceed by unpacking the P2P acronym, examining the impact of characterising exchanging parties as peers rather than simply users, and as a relational acronym rather than an acronym describing the direction of the transaction. Finally, I go into more depth with the technical beginnings of the phrase P2P, its original practical purposes and its political and ideological characteristics to see how this relates to the P2P of mainstream digital wallets.

Peers and Intermediaries

Though these Indonesian apps may not advertise themselves as being P2P payment services as evidenced by the Gojek advertisement, they still lean into this form of narrative around their product that the exchanging parties are engaging on equal terms and with very limited intermediation by the app itself. After all, the driver in question is not even seen to be paid for her

labour, instead filling an important and rewarding social role. Furthermore, as I will show later in this thesis, though payments through these apps are ultimately settled through conventional banking infrastructure, the role of the bank is rendered discretely within the frictionless aesthetics of the app's interfaces. It is worth noting how the apps in my case began as transport services, growing first into digital payments and are now, as I will describe in the next chapter, venturing into providing additional financial services specifically P2P lending. While P2P lending itself is outside the scope of my thesis, I did conduct several interviews with people working in the industry and people using these services to better understand the concept.

In one interview with a P2P lending company that had been engaged in providing internal lending services for Gojek drivers, I asked the co-founder how she would define P2P lending. She told me that it was strictly defined by the Financial Services Authority (OJK – *Otoritas Jasa Keuangan*) as 'an interaction between lenders and borrowers, with an intermediary company facilitating the exchange in exchange for a fee'. In this case, she explained that peers are either individuals or companies. It was a striking definition and it seemed at odds with what I socially understood by the term peer. The origins of the term peer stem from the Latin and French terms for equal, *par* or *per*, dating as far back as the 12th and 13th centuries (OED, 2020). Though some uses are now obscure, it can be used as a noun, verb, or adjective, and generally refers to a person or object of equal status or rank to someone or something else. Though the differences in meaning across its definitions are discreet, they can still be roughly sorted into three broad categories as I outline below: peer as a social equal, peer as a titular rank, and peer as a network node. I am particularly interested in how the phrase peer-to-peer, a term from computing, came to describe an economic transaction, and how the retention of the term peer in this context, imbues the expression P2P payments with certain social meanings.

SOCIAL EQUAL

Peer-review, trial by peers, peer-pressure – the most common understanding of the term peer today is a social category describing people of the same age, social or professional group. The implication is that the people within this group can be considered social equals or as having equal civil status. The literal translation of the Indonesian phrase *kawan sebaya*, meaning peer, could be described as 'friend of the same age' or 'a contemporary'. The term can also be used to set someone apart, as being without peer or equal in terms of skill or expertise.

TITULAR RANK

In several countries, such as France, Japan, Spain and the United Kingdom, peer also refers to a member of the hereditary nobility or someone who has been elevated to peerage. In some

countries, such as the United Kingdom, this rank of peer reserves access to political influence in the form of assigned space within governing bodies. Peer refers not just to members who are within the same social group but implicitly distinguishes them as a hierarchical class, separating peers from commoners.

NETWORK NODE

More recent use of the term peer comes from computing, in which the term peer refers explicitly to a device or node connected to a network. Specifically engaging with other peer devices directly through the same network without a trusted centralised server. Here, the flat and equal peer relationship of a peer-to-peer network is used as a contrast to the more hierarchical relationship of client-server network topology. This is also the technological premise for the concept of cryptocurrencies as a disintermediated financial service discussed later in this chapter.

There are two main takeaways from these definitions. Firstly, all three categories are characterised by the critical underlying trait; that being a peer is something that can only be defined in relation to something else be it to your social equals, to other social classes, or computers and servers. Secondly, all uses imply a sense of equality within the peer relation whether socio-economic or computational. This is what made the easy interchange of peers as either individuals or companies in the definition of P2P lending so surprisingly contradictory. How could a company providing a loan ever be equal to an individual loan taker?

Another company I interviewed in Indonesia used a digital platform to connect lenders and groups of women who would take on a collective loan through microfinancing, a concept which I will return to briefly in chapter 3. Interviewing one such group of women, I tried to understand the relationship of these women to their so-called 'peer' who was providing the loan. One woman shared that she knew the person because it had been in the information sheet provided to her by the company. I followed up:

Q: Do you know their name?

All: It's there.

Q: But do you know their face?

A1: No. Well, now where is the – [to the others] is this included?

A2: When I read mine, his name was Triyanto. [laughter] There is, there is a picture, below.

[FGD 1]

The women were joking with me about the distance between themselves and the loan giver, who they did not really know. For them, the debt relationship was with the company agent who visited them weekly to receive their collective debt instalments in cash. It felt far removed from the

visions of a public and mutually equal dynamic evoked by the term peer. But it was also a striking example of the many layers of intermediation taking place in this P2P exchange. Each week, the agent would count the money that the women brought and input it into the company app. Once all parties agreed that the correct amount had been collected, the group representative would come forward and swipe the green button in the app on the agent's phone to confirm the new balance of their loan. This would trigger the release of the equivalent amount of funds to be transferred from the company bank account to that of the loan giver. The agent would then as quickly and safely as possible ride a motorcycle back to the nearest bank branch or company branch office to deposit the cash into the company account. The entire endeavour was heavily premised on the trust between the women, the agent, the company, and the material cash. Where the company maintained a digital record in the app, the women kept the analogue equivalent through a detailed paper log of their instalments which the agent would sign in return.

Both a distortion of the more traditional rotating credit and savings associations in Indonesia known as *arisan*, this exchange seemed far removed from the original P2P proposition of establishing an exchange network without trusted central intermediaries. The role of the intermediary here is in the navigation of the transition from cash to digital forms of money, precisely through establishing trust between the exchanging parties. Another example of this came from my interview with a company engaged in shariah finance. I had reached out to them after reading a paper they had published declaring Bitcoin to be halal (see Abu-Bakar, 2018), and figured they would be able to provide additional insights into P2P transactions. Their CEO explained that the company had begun to expand into cryptocurrencies as a way to help their clients pay their annual *zakat*, or religious obligations of 2.5 per cent on assets held for more than a year (Maurer, 2005). Critically, the *zakat* payment must be in the form of the asset itself and must be given to someone poor. Since owning cryptocurrency assets is relatively new in Indonesia, there was no existing method for paying such obligations. The company established a collaboration with an Indonesian cryptocurrency exchange, thus providing a trusted 'crypto-zakat' service, through which these assets could be converted into rupiah and donated to orphanages. As I will discuss later, the very purpose of cryptocurrencies is allegedly a decentralised and disintermediated financial service. Yet even within the use of decentralised technologies, there is still a space for intermediaries who can facilitate various elements of a transaction.

I give these examples because they draw attention to both the intermediating infrastructures of digital payments and the ways in which they impact the relational dynamic of the multiple exchanging parties involved in a seeming P2P transaction. The enabling infrastructure here is not

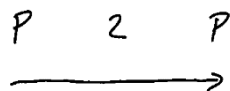
just the network, but the smartphone, the paper log, the ATMs, the apps, their interfaces and their swipeable icons. As exemplified in the Gojek advertisement, and as I will discuss in the next chapters, these apps position themselves as neutral platforms through which those providing and those seeking services can meet and transact. In practice, of course, deploying the language and aesthetics of peer-to-peer transactions also obscures the role of these intermediaries, their control and their responsibility for defining the conditions for this exchange. Thus, to further understand these relational dynamics as they are experienced in practice by users of these digital wallets, I proceed with unpacking the P2P acronym to understand developments from its origins and examine its applications.

P2P: A Relational Acronym

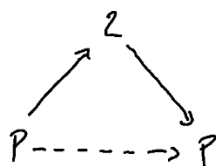
The phrase 'peer-to-peer' is used to describe diverse types of payment systems typically provided through fintech companies. The example that has drawn the most academic attention is the digital financial service known as M-Pesa. Launched in 2007 by the mobile network operator (MNO) Safaricom in Kenya, M-Pesa has since expanded internationally, allowing mobile phone users to transfer money to each other through text message using only a feature phone and the existing mobile network (Maurer et al., 2013a). Through a network of agents, users can load their digital balance with credit, paid for in cash, and then 'cash-out' their balance in exchange for the local currency. This simple system of 'mobile money' allows people to make payments or send remittances far more rapidly and at lower costs than existing financial service actors. This type of digital money is usually characterised as 'person-to-person' or 'peer-to-peer' payments because it allows people to transfer money to each other without the use of a bank. This innovation was particularly interesting because it brought important financial services normally inaccessible to poor or socio-economically marginalised people. It attracted established actors from the communication and payments industry such as those in Indonesia, alongside organisations and institutions within the international development industry where digital payments are frequently heralded as contributing to global poverty reduction (Rea and Nelms, 2017), which I explore in more depth in chapter 3.

The idea of P2P payments emulates the meaning of P2P network topologies, along with cryptocurrencies, allowing users to bypass conventional centralised banking services and make transactions directly with each other. The critical difference is that these commercial solutions generally build upon underlying banking infrastructure. In their working paper, *Mobile Money: The First Decade*, Stephen C. Rea and Taylor C. Nelms (2017) describe P2P as the 'primary use case' of mobile money; a peer-to-peer transaction where one person transfers a form of digital value to another. In the case described by Rea and Nelms, the object transferred is a sum

denominated in a state-issued currency which the recipient can later exchange for the tangible cash version. “This is the “atom” of mobile money,” they write, “its fundamental transactional form: P2P money transfer. Two actors, two nodes, and a technical network between them” (Rea and Nelms, 2017, p. 8)



The language of peer-to-peer is prominent within the use of commercial digital wallets and conveys the idea of mutual exchange in accordance with the P2P-ideal of a flat, symmetrical, or egalitarian relationship without an intermediary. With nothing but a ‘neutral’ technical network as an intermediary. Rea and Nelms make two very important observations about the P2P acronym. Firstly, this transaction has to happen *through* something. Using hardware, services, networks, app interfaces, agents and third parties in the exchange; “P2P only functions through these intermediating infrastructures and the particular contexts that, in turn, shape those infrastructures” (Rea and Nelms, 2017, p. 9). Rather than interpreting the ‘2’ as a numerical representation of the direction of the transaction, it might serve an analytical purpose to consider it a placeholder for the intermediaries facilitating the digital transaction.



Secondly, Rea and Nelms point out that the P’s on either side cannot be understood as monolithic categories. Much like in the Indonesian definition of P2P lending, the P might actually be an (I)ndividual, or a (C)ompany, or a (G)overnment institution as Rea and Nelms suggest (Rea and Nelms, 2017, p. 9). Even in cases where both P’s are people, the term peer alludes to certain expectations and sentiments of socio-economic equality that affect the dynamic between the exchanging parties and which may not be present at all. Thus, the P’s also function as a form of placeholder with the term peer operating as a stand-in for a plethora of complex social and economic relations.

The simplistic representation of the *directional* transaction implied by the P2P acronym provides a superficial rendering of the complex exchange relationships it contains. It might be instead useful to understand the term as a *relational* acronym, where the so-called peers on either side of the exchange have their own relationship, as well as relationships to the intermediaries. I suggest that the use of the term peer confuses not only these complex relational dynamics but also obscures the power that the intermediaries exert in configuring the conditions of the exchange

relationships of these alleged peers within their transactional communities.

Writing about the development of computer systems, Steve Woolgar (1991) made the case that the emergence of a technology must also entail the emergence of “The User”. Rather than being a specific person, The User is a composite character, a caricature of what actions those designing the technology imagine its future users to make. Woolgar argued that these imagined actions become encoded in the machine itself, manifesting The User in the form of affordances and control mechanisms and defining the range of possible actions that any user could take. “Consequently, it is better to say that by setting parameters for the user’s actions, the evolving machine effectively attempts to configure the user” (Woolgar, 1991, p. 61).

Woolgar’s argument is provocative in its choice of words. Configuration, at least in the context of computer systems in which he was writing, involves organising something to fit a designated task, or as a friend and computer scientist explained it to me, “configuring something means to put it into the state it needs to be in, for whatever you need it for.” If configuring users means encoding the range of possible actions of the imagined or desired user into the infrastructure of payments, then what does it mean to configure peers? A peer is of course also a user of a technology, but the term peer introduces additional dimensions to the person and perhaps requirements from the technology. Where a user emerges in relation to a technology, a peer must also necessarily be in relation to someone else. In the case of P2P payments, the person on the other end of the transaction. In other words, the use of the term peer rather than user imbues the transaction with a certain ‘semantic richness’ (Gillespie, 2010) which influences how the concept of P2P payments is perceived. The condition of being a peer must be defined in relation to something else but also implies a fundamental sense of equality within the peer relation.

The phrase peer-to-peer as it is understood within payments generally describes the direction of the flow of money. However, the use of the phrase peer-to-peer, rather than for instance user-to-user, undeniably also introduces an implicit social meaning to the exchange relationship: that the peers on either side of the exchange are peers in relation to each other and the dynamics of the exchange are thus imbued with this diffuse yet inherent social equality. In the context of network nodes, peer is used as an alternative to a hierarchical arrangement. But what is the equality implied in the P2P of payments? Are they peers of equal social status or ‘contemporary friends’? Is it that they are accessing the same resource or are presumed to have the same capacity for operating the technology? Is it within the configurations of the technology that they are defined as equal parties? Or is this peerhood one that emerges when all other aspects of their social context are removed, leaving only equality because everything but the fact of the exchange itself has been stripped away?

Woolgar was not alone in writing about non-human actors challenging the assumed hierarchical agency of humans over objects and how forms of agency are granted to these technological things (cf. Ashmore, 1993; Johnson, 1988). Lucy Suchman (2012) describes this in different terms, focusing on what she calls the ontological politics of design and use, and the “ways in which technologies materialize cultural imaginaries, just as imaginaries narrate the significance of technical artefacts” (Suchman, 2012, p. 48). Suchman encourages us to examine how these imaginaries and practices are “presupposed by and built into particular technological artefacts” (Suchman, 2012, p. 50). How these app companies define peerhood and how they envision these transactional dynamics will be integral to the ways in which they build their digital payment infrastructure.

While acknowledging Woolgar’s observation has been generative for the field of study, Suchman argues that his use of the term configuration is overly deterministic and relies on an ‘over-rationalisation’ of both users and designers. She argues that this overestimates “the ways and extent to which definitions of users and use can be inscribed into an artefact” (Suchman, 2012, p. 56). By contrast, Suchman suggests that neither user nor designer can be understood in such stable terms, nor is their relationship monodirectional as user behaviour also affects design. Breaking down the concept of configuration, Suchman explains that to *figure* is to give something form. The process of doing so involves choosing which features to draw attention to: what to highlight and what to obscure. To *configure* is then to figure things together. Configuration is not simply how the user might be encoded into an app, but how the ‘technological discourses and practices’ surrounding the technological artefact are joined together with it (Suchman, 2012, p. 48). As I will show later in this thesis, throughout my fieldwork I found that Indonesian drivers and customers alike were constantly navigating complex relational dynamics imposed by the infrastructure of payment platforms such as Gojek. But they were also challenging these impositions, forming their own configurations both within the parameters of the apps and external to it and enacting their own forms of peerhood.

None of my Indonesian interlocutors ever used words such as peer, but I find that the conceptualisation of peerhood i.e., the condition of being a peer, provides an interesting point of departure for investigating the configurations of the many P’s and 2’s that are entangled within the P2P of digital payments in Indonesia. In Woolgar’s interpretation of configuration, we might ask how these apps encode their users, and to what extent this aligns with and supports peerhood. Suchman’s broader conceptualisation extends beyond the configurations of the app, encouraging us to examine how these alleged peers are configured in relation to the app, to each other, and the companies making this configuration far from monodirectional.

Protocols of Participation

Having thus explored the nature of peerhood, I want to return to the constellation of peer-to-peer itself to better understand its use and contradictions in the context of payments. In the following section, I explore the deeper techno-economic imaginaries, or what Lana Swartz defines as theories “of the larger social order” (Swartz, 2018, p. 623) entangled with the concept of P2P payments. I show how the term peer is not just relational and evocative but political; a figure one might say of equality, mutualism and cooperativism.

The term P2P arose before contemporary digital payments, namely in the early development of the underlying infrastructures of the internet. Much like related network terminology, such as ‘decentralized’ and ‘distributed’, its exact definition continues to be discussed. Similarly, it is a term that has deep ideological roots and a diverging politics of implementation. It describes a network topology through which “any computer on the network can talk to any other computer, resulting in a non-hierarchical, peer-to-peer relationship” (Galloway, 2006, p. 8). Alexander R. Galloway describes the TCP/IP suite of protocols,⁷ commonly used to govern communication through the internet invented in 1974 by Vincent Cerf and Bob Kahn. P2P distinguished itself in this way from what is known as client/server networking, where a central server stores data and responds to requests that it receives from clients. In P2P each participating node can communicate *without* requiring a central server. Instead, each node in the network shares the same software and makes available portions of their computational resources, while also using resources provided by others (Schollmeier, 2002). Galloway continues, as “one technical manual puts it: “IP uses an anarchic and highly distributed model, with every device being an equal peer to every other device on the global internet”” (Galloway, 2006, p. 8). Thus, everyone in a P2P network is both contributing and consuming bi-directionally, they are both client and server and each peer contributes to maintaining the communication infrastructure. This is in part a practical consideration, as hosting servers is expensive and thus the distributed network makes the infrastructure more affordable. A common illustration used to distinguish these types of communication infrastructure are Paul Baran’s network topologies of both a centralised and distributed network. They show how communication either travels through a central server or across nodes in a P2P network.

⁷ Transmission Control Protocol/Internet Protocol

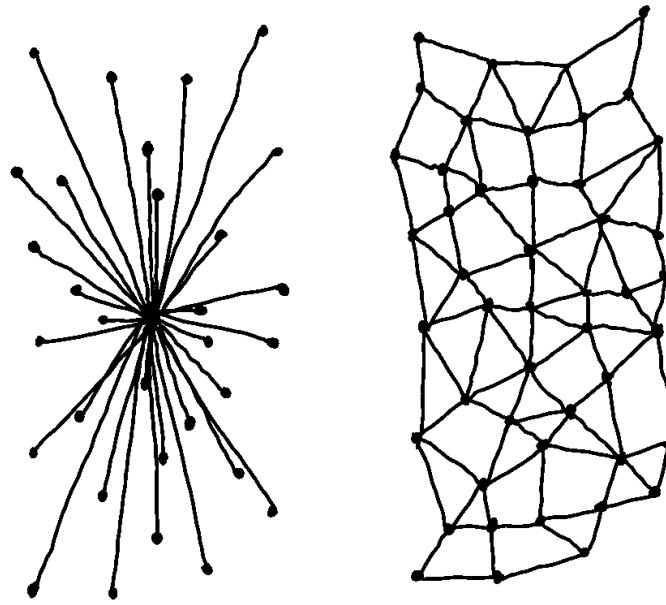


Figure 2: Centralized vs. distributed network, based on Paul Baran's network topologies from 1964.
(drawn from Schneider 2019, p. 274)

The illustration, the acronym, and even the definition of P2P may seem simple and straightforward, but things become more complicated when we examine the politics of implementation. Writing about the mechanisms of control on the internet, Galloway examines the emergence of protocols as governance mechanisms in the context of decentralised and distributed communication networks. Galloway defines a protocol as “a set of recommendations and rules that outline specific technical standards” (Galloway, 2006, p. 6). Protocols, he explains, are used in situations that require decentralised norms for conduct, guidelines for political practice, and defining the realm of acceptable behaviour. His examples include both diplomatic negotiation and traffic protocols such as speed limits and right-of-way. Situations that require some form of self-governance, but where the protocols “establish the essential points necessary to enact an agreed-upon standard of action” (Galloway, 2006, p. 7). Some examples of P2P protocols for a decentralised or distributed network are TOR for anonymous internet communication, DAT for sharing data sets, and blockchain projects such as Bitcoin and Ethereum which also operate with P2P network protocols.

Galloway points out that similar to its social and political protocol predecessors, network protocols are negotiated and ‘agreed upon’ by a certain set of actors then implemented to a broader population. However, adherence to protocol in the context of diplomatic practice depends to a large extent on the timing and sensitivity of the negotiating individuals, and the adherence of car drivers relies on a sense of responsibility for not endangering oneself and others. By contrast, protocols defining the terms of participation in digital payments are encoded in such a way that

most people will find their available options depending solely on how that code was developed and implemented.

The idea of implementing 'decentralising protocols' and enabling 'peer-to-peer' file sharing is not purely a practical pursuit in terms of efficient internet infrastructure. The language conveyed in the technical manual relayed by Galloway reads almost romanticized with the emphasis on how everyone is an equal peer on the 'global internet'. Although it is worth noting that the peers here are devices, not people. Drawing on political and socio-economic understandings of decentralisation within network and blockchain cultures, Nathan Schneider (2019) demonstrates that much of the technological drive towards decentralisation is ideologically driven. The purpose of P2P protocols, Schneider argues, is generally understood as being able to achieve 'decentralisation'. However, on closer inspection, he finds that this term remains elusive and poorly defined, drawing on a wide variety of political aspirations from related cultures that generally understand 'decentralisation' to be something inherently positive and desirable. Referring to the Ethereum blockchain community he writes, a "measure of this 'movement' lies in the increasingly common characterization of decentralization as not just a design principle but a philosophical aspiration" (Schneider, 2019, p. 271). Network and blockchain cultures are embedded with ideas about 'cutting out the middle-man' and they place great value on 'disintermediation, in eliminating dependence on central authorities, be they servers, states, or financial institutions.

Rather than understanding 'decentralisation' as a purely technical term, Schneider suggests it should also be understood as a guiding ideology or rhetorical strategy. This understanding is shared and expressed by Jaya Klara Brekke (2020) who writes, decentralisation "forms the crux of the proposition of these network technologies, but arguably the only shared understanding of its meaning is in its particular instantiation as peer-to-peer network topologies" (Brekke, 2020, p. 4). While the varying definitions may at times even be contradictory, the term serves as an ideological umbrella, allowing actors with disparate motivations and goals to collaborate on building technological infrastructure. Brekke describes what she calls 'hacker-engineer' sensibilities, and that the 'peer-to-peer vision' is as much about non-hierarchical networks as it is an anti-authoritarian strategy for resisting mainstream "legal, corporate and government actors" (Brekke, 2020, p. 7). As mentioned, hosting a server is expensive and thus the centralization of the internet is enabled by these mainstream actors being able to afford to do so. P2P becomes a practical alternative and is what enables there to be resistance. Ironically, considering that the definition listed earlier of peer being a higher social rank, a peer in this context can almost be framed as an underdog and a community-oriented identity.

However, as Schneider points out, the allure of the concept of decentralization in several instances obscures integrated practices of centralization. These centralising governance dynamics, Schneider argues, are even more complicated precisely because of the language of decentralisation. Turning back to the early Internet protocols, he shows how the language for standard-setting itself is formulated to disguise central decision-making structures by appearing to be meritocratic and notes that “even the subversive peer-to-peer file sharing networks adopted server-like ‘ultra-peers’ and ‘super-nodes’ in order to ensure faster indexing and searching” (Schneider, 2019, p. 278). In practice, this exemplifies that implementing and maintaining non-hierarchical governance structures for the digital commons is challenging. It also shows how the strong social understandings of the concepts such as peer and decentralising contribute to obscuring underlying hierarchical power dynamics.

Though the P2P acronym is used by both, the term ‘peer-to-peer’ means something different in the context of networks than it does in the context of commercial digital wallets. P2P protocols are intended to decentralise, to remove the ‘middleman’ and to ‘disintermediate’. What could be more ironic than to have the term co-opted by mainstream, centralised fintech wallets that are saturated by intermediaries so that we might more accurately call it P3P or P(n+1)P. P2P networks may also be more topographically challenged than the technical language conveys, and network participants may find themselves intermediating and relying on intermediation more than they would like to admit. There are lessons to be learned from the mainstream wallets in terms of how the term peer is evoked and how peerhood is configured. Much like how these fintech companies use the language of financial inclusion as an avenue for promoting their products and engaging new customers, I would argue that they benefit from the positive connotations of the socialised understandings implied by the term peer in P2P payments. Drawing attention away from the centralised control over the privatised exchange infrastructure, the associations of P2P payments can encourage general public acceptability: from users, from government, and from investors.

1.3 Technologies for Keeping Account

Having established the socially understood meaning of peer, the practical and ideological origins of the concept of P2P and its distinction from what is now commonly meant by P2P payments, I turn now to the concept of digital payment. My purpose is to examine what type of technology P2P digital wallets are, and how this underlying infrastructure impacts transactions made through them. I begin by examining how money can be said to originate as a technology for keeping account of extended personal and societal debts, and how this form of cash can be considered a

public utility. I explore how the digitalization of these accounts centralizes control of transactions, and how they have changed the business models for the companies providing transaction services who can monetize the transactional metadata they accumulate through their users' engagement with their services (O'Dwyer, 2018). I inquire further how this increasing privatization of payments and aggregation of data was a concern for some parties that led to initiatives to develop public digital money alternatives using the P2P network topology described earlier. Drawing on the same threads of P2P as both a practical and ideological technology, I examine how this version of P2P payment works in practice, and how its practical governance and competing ideologies challenge its viability as a public alternative for digital payments. Finally, I return to the concept of P2P payments as manifested in commercial fintech wallets. I draw on Lana Swartz' (2020) characterisation of 'transactional communities' to explore the politics of payment pertaining to the types of digital payment platform exemplified by the Indonesian digital wallets.

Transactional Tokens

At the Sonobudoyo Museum in Yogyakarta, an information placard reads: "Along with the development of commerce and culture in Ancient Java, people came to recognise a currency system as a means of exchange and a method of payment and other purposes." The people of Java used multiple currency systems, the placard explains; the Kati, the Masa, the Tahil, gold, silver, bronze, and iron coins, and as in this glass showcase, Chinese 'cash'. Later there would also be forms of currency implemented during Dutch colonisation, Japanese occupation, and finally, with the declaration of independence in 1945, the Indonesian rupiah (Cribb, 1981).

On the Bank Indonesia (BI) website, each page refresh reveals one of several decorative illustrations related to the history of the bank. One depicts a variety of historical rupiah coins and a hover text reads; "money arrived as a replacement for the barter system that became outmoded over time and no longer met the needs of the people." It describes various forms of such uang barang, commodity money that took the form of shells, beads, and other goods, and stipulates that new forms of currency were required for trade, concluding that "this is the origin of currency made from metal coins."

It is tempting when looking at these old coins to draw an evolutionary line to the digital money forms that present-day Javanese people carry around in their smartphones. It is an unceasing irony of how cultural ideas about modernity are entangled with digital payments and 'cashlessness' when cashless transactions are not a modern innovation at all. Indeed, they existed long before the invention of smartphones and satellites. For example in the form of transactional record-keeping on clay tokens, dating as far back as 8000 BCE (Schmandt-Besserat, 1992). Such

tokens allowed transactions to take place without the exchange of any physical object, providing instead a record of transactions and subsequent obligations owed (Maurer, 2018).

The narratives about the evolution of money, as presented in both the museum placard and the BI website, both present an origin theory of money as emerging from barter. Metal coins gradually replaced 'primitive' forms of money, such as shells or beads, eventually evolving into paper notes, plastic cards, apps, and even cryptocurrencies (Maurer, 2006). Prevalent in orthodox economic teachings, it is a theory that stipulates that money originated as a tool for facilitating the transaction of goods and services of disparate value: money represented a common mediator with a so-called 'objective value' (Graeber, 2011). Detached from specific material affordances or social entanglements and with limited attention to where this objective value comes from. The premise being that in situations where two people sought to trade items but did not need what the other was offering, money could be used as a substitute. What money then resolves is situations where a trade relies on there being a "double coincidence of wants" (Graeber, 2011, p. 22). With money, the trading parties can agree on a standardised value of their goods in the form of a price, denominated and materialised in these money coins.

This narrative of money originating out of barter is a pervasive, compelling, and seemingly intuitive idea. However, an extensive body of literature within both economic anthropology and the archaeology of money suggests that this perception is not only wrong but backward. Credit systems have existed long before the invention of coinage: money is the eventual materialisation of existing complex credit and debt relationships rather than acting as their enabler (Graeber, 2011). Money can therefore be understood as a technology of accounting. Digital forms of money rather than being an evolution of cash can alternately be understood as an evolution of accounting technology.

Money-tokens did not 'arrive' as described on the BI website. There has instead always been a plurality of money-objects in circulation deriving their various forms of value from their immediate social context, traded not because of a specific intrinsic value, but because of how they make certain social relationships visible (Strathern, 1992). Bill Maurer (2018) describes how processes of standardisation of value, for example as metal coins, separate money from its socially constructed value. The coin itself is then reduced to a "wholly abstract token" whose value can be determined through monetary policy or market speculation (Maurer, 2018, p. 8). With debt in general, the issue is ensuring that someone is willing to accept your debt token in an exchange. This relies on trust between the trading parties that the token at hand constitutes some form of value. This turns our attention to the process of payment; the intermediary individuals, companies and infrastructures that enable that acceptability. Enabling people to settle the debts of their

transactions in the form of payment has become an industry of its own and has received renewed attention in the past decade due in part to the increasing digitalisation of money (Maurer, 2018). When the discourse surrounding digital payments emphasises the phrase ‘cashless’, or ‘less-cash’ as advocated by the Indonesian government (see Zuhra, 2016), we obscure what it is that these cash transactions are replaced by (Scott, 2017). When you make a digital payment, what you are doing is requesting the entity which keeps your record of accounts to alter that record and the record of the person you are making the payment to. This takes place through banks and various third-party payment processors; card-issuers such as VISA, or the owner of the QR code that a merchant uses to provide an app-based payment option. Thus, what happens in a cashless, or ‘less-cash’ society as promoted by both the Indonesian government, international development agencies, and fintech actors, is the centralisation of control over payment infrastructure to private actors. This is in the form of both commercial banks and payment industry actors, as I will discuss in the following chapters. Where cash can be considered a public, state-issued, social infrastructure, digital payments are generally the domain of private entities (Dalinghaus, 2019). Though the money transacted through the Gojek app may be denominated in the state-issued Indonesian rupiah, the tokens are contained within and transported through private infrastructure where the market not only determines the price to be paid but the price of the payment itself.

Suggesting that we understand payment as the “act and infrastructure of value transfer” ((Maurer, 2012, p. 19), Maurer argues that focussing on the process of payment asks “what value can be mined in the act of transferring and settling it” (Maurer, 2012, p. 17). As the representative of one of the Indonesian fintech companies described to me, when a customer used their app to make a payment using a QR code at one of the associated merchants, they would receive 1 per cent of the transaction as their payment. This 1 per cent was further divided and shared with the company owning the QR code as well as “the switch”, the company authorising payment processing. Of course, if the company is earning less than 1 per cent per transaction while also giving the customer a 30 per cent cashback, things do not add up. Digitalisation has changed the income models of established actors within the payment industry and introduced these new actors. For the intermediaries processing digital payments, the value in providing payments infrastructure shifted from imposing fees or ‘rent’ in exchange for the service, to the value of the transactional metadata itself (Maurer, 2012).

If money is a technology for keeping account of societal debt relationships, then the money tokens in my pocket, the receipts in my wallet, and the numbers in the activity log of my GoPay app all “constitute a way of summarizing [my] relationships with society at a given time” (Hart, 2007, p.

16). The digitisation of money also results in a digitalised form of our personal identities. When I transfer cash, the only proof of the exchange is a possible receipt. When I purchase things through the Gojek app, I let the app and its owners know where I like to shop, what I like to buy, who I like to buy from, what my transport routes are, what I am willing to spend and much more. The merging of our money with our transaction history risks reducing people to “a formal abstraction of individual human beings, to a cipher in a universe of numbers” (Hart, 1986, p. 642). Where cash is anonymous and usable only by whoever is holding it, digital money becomes hyper-personalised. Of course, digitalisation is not just about moving the payment infrastructure from our hands and wallets into digital databases. It has also facilitated an unprecedented aggregation and personalisation of this transactional metadata. As Rachel O’Dwyer defines it, in “virtualising money, non-cash payments materialize previously latent informational traces of who transferred money to whom and in exchange for what” (O’Dwyer, 2015a, p. 5). Referencing the digital storage of data, O’Dwyer refers to this as the ‘cache society’, where memory traces of our extended social relationships chartered through our complex debt and credit relationships form a novel type of value for the intermediaries of our transactions (O’Dwyer, 2018). 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), providing them with a continual source of revenue.

Public Alternatives

This unprecedented generation and collection of personal transactional data are what leads Brett Scott to describe the cashless (or bank-based) society as 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 the increasing privatisation of monetary systems and the increasing power of its proprietors; centralised financial institutions verifying transactions through private databases. Throughout the ‘80s and ‘90s, cryptographers and self-declared ‘Cypherpunks’ anticipated this increasing privatisation, surveillance, and consumer data generation. They worked to develop an alternative pathway for the digitisation of money leading to multiple experiments with cryptographically secure digital money, or cryptocurrency (Brunton, 2019). A notable example of this is the ‘e-cash’ developed by cryptographer David Chaum. The purpose of this digital currency was not to develop a parallel money system but to provide banks and users with a technology that ensured that digital money was secure and retained the privacy of cash (Hayes, 2019). E-cash did not see wide adoption and Chaum’s company, DigiCash, eventually filed for bankruptcy. Arguably DigiCash’s premise was not actually in the financial interest of those same financial institutions. However, the technological breakthroughs involved in its development laid much of the groundwork for the development of

the more famous cryptocurrency, Bitcoin.

In the 2008 whitepaper, Bitcoin is said to enable a “purely peer-to-peer version of electronic cash [that] would allow online payments to be sent directly from one party to another without going through a financial institution” (Nakamoto, 2008, p. 1). The idea of using P2P networks as a way to manage a decentralised process draws back to the origin of the internet and is a prominent ideal in the open-source community. The Bitcoin whitepaper came following the global financial crisis of 2007-2008, a time where people were disillusioned by the conventional banking system (Maurer et al., 2013b). This made the idea of community-owned money and of not having to ‘trust’ a centralised intermediary particularly compelling. In theory, the technology would enable users to bypass centralized banking services entirely.

The innovation that distinguished Bitcoin from other similar experiments, was that it offered a solution to the so-called ‘double-spending problem’ which required proof that your digital token definitively changed ownership once exchanged rather than existing in various digital copies. Chaum’s inability to verify the uniqueness of each token and instead to need “a central register to check each transaction was what forced [him] to partner with banks” (Bridle, 2019, p. xii). What the Bitcoin whitepaper proposed, was a distributed public ledger known as a ‘blockchain’. Blockchain describes a distributed database: a time-stamped record of transactions, publicized, maintained, and validated by a wide network of participating nodes referred to as ‘miners.’ These decentralised participants group batches of transactions into ‘blocks’, each containing the timestamp of the previous block to form long chronological chains. Thus, the resulting blockchain constitutes a publicly viewable linear history of every transaction (Brekke and Vickers, 2019). It is this decentralised network of ‘miners’ verifying transactions conducted using digital tokens that eliminates the need for the centralised register managed by banks.

While the word ‘blockchain’ may conjure images of circuit boards, hackers, and spiderwebs of interconnected nodes, a more accurate depiction would be a noisy warehouse, stocked to the brim with servers. Whirring fans cool machines that have one continuous occupation; to expend vast amounts of computational power to solve complex cryptographic puzzles. These puzzles are part of a consensus protocol designed to ensure that no single participant can gain control of, or change, the record. In exchange for the significant energy consumed in the process, participants are rewarded for each block they ‘mine’ (Maurer et al., 2013b). This process is both how new coins come into circulation, as they are traded and exchanged for government-issued money or other cryptocurrencies. But it is also what makes each recorded transaction with existing cryptocurrency costly in terms of energy consumption.

Blockchain is also an ideologically driven project much like the concept of P2P itself. In conventional digital payments, the transaction is just a digitised record of accounts that you ‘trust’ your bank and payment provider to accurately update and maintain. In practice, this centralisation of authority means that you also ‘trust’ them not to deploy transactional censorship. One example of a stigmatised and vulnerable group whose digital transactions are commonly censored is sex workers. Their accounts are frequently closed by private intermediaries such as PayPal and Venmo, effectively closing them off from access to their income due to the stigmatization and legal status of their labour.⁸ By removing this central intermediary, blockchain proponents claim it to be ‘trustless’. The degree to which this authority is genuinely distributed among the network participants is more questionable as I will return to later, with over 50 per cent of Bitcoin’s mining power being controlled by just 4 nodes at the time of writing (bitcoinaera.app, 2021).

Fintech actors argued that commercial P2P payments could contribute to poverty alleviation and financial inclusion for those excluded from formal financial systems. Whereas actors from the blockchain community claimed that cryptocurrencies would liberate people from having to rely on these private financial actors by providing the poor and ‘unbanked’ with a form of ‘quasi-bank account’ (Scott, 2016). In practice, this narrative may be more complicated. Though the use of cryptocurrencies as payment is technically illegal in Indonesia some public figures such as the former Minister for Finance, Chatib Basri, have publicly argued against restricting the use of blockchain, pointing out that such regulation would be ineffective and counterproductive (Sembiring, 2018).

In 2019 I attended an annual blockchain event in Jakarta targeting industry and government actors. Dr. Edi Prio Pambudi, assistant deputy minister to the Ministry for Economic Affairs, delivered a keynote speech regarding his expectations about Indonesia’s capability and position as a regional blockchain hub (BlackArrow Conferences, 2019). He told the select ‘public’ crowd in the chandelier-illuminated Ritz-Carlton ballroom full of mainly developers, blockchain businesses and so-called ‘angel’ investors,⁹ “I assume this is not just a conference, but also a public hearing”. As they cannot legally be used as payment, cryptocurrencies are regulated as an asset class, which means that the main appeal becomes one of speculative value, an avenue for wealth generation. This is a stark contrast to narratives in which the purpose is censorship resistance and a digital

⁸ For a list of discriminating platforms see Survivors Against SESTA: <https://survivorsagainstsesta.org/platforms-discriminate-against-sex-workers/>. It is worth noting that even cryptocurrency exchanges such as Coinbase are listed here.

⁹ Wealthy individuals who provide early capital support to start-ups.

public alternative to formal financial services.



Figure 3: Cryptocurrencies at the Ritz-Carlton ballroom

While decentralised and so-called ‘disintermediated’ financial technologies might theoretically provide an alternative to some conventional actors, in practice, accessing and using cryptocurrency requires skill, knowledge, money, and technological tools. The less you have of these, the more you depend on various willing intermediaries to facilitate access. However, even those who are well resourced might want forms of intermediation when engaging with cryptocurrency. At the blockchain event, a representative of a Swiss company providing encryption hardware told me that he believed the future of the industry was in custodial companies that would hold people’s cryptographic ‘keys’, giving them access to their stored cryptocurrencies. Asking the representative for an example, he suggested that banks would be an obvious custodial choice as people already trust them with their money. I could not help but point out the irony of this idea. He laughed it off saying, “I know you’re supposed to be ‘king of your own keys’ but...”, he shrugged and pointed out that people could not be trusted not to lose their keys. As the value of crypto assets rises,¹⁰ the risk from losing access to them is significant and it is not wrong to assume that some people would be interested in a safe, trusted, solution for their key. In both cases, this is contrary to the narratives of blockchain as a decentralised and trustless technology, reminding us that as a technology it must also be understood in its broader social context. David Harvey reminds us to question what he calls “the crude assumption that decentralisation is inherently more democratic” (Harvey, 2015, p. 142). As much as blockchain can be a tool for decentralised organisation, one could argue it also recentralises wealth and power (O’Dwyer, 2015b), and enables the more privileged to opt-out of existing societal

¹⁰ Value denominated here in US dollars (USD).

infrastructures rather than addressing systemic inequalities and establishing more equitable alternatives (Scott, 2014).

“In P2P, token is a bad word.”

It was not until attending a panel discussion entitled State of P2P at DevCon5 in 2019 that I fully grasped these ideological disparities of P2P and cryptocurrencies which contextualised my experience in the Ritz-Carlton ballroom.¹¹ During the panel, disparate panellists generally agreed that ‘centralised services will become obsolete’ but disagreed on the path forward and on the specifics to implement that decentralised vision. Panellist Karissa McKelvey drew attention to this ideological divide within the community. A long-time advocate for and developer of P2P technology (cf. Robinson et al., 2018), McKelvey expressed that “in P2P, token is a bad word.” The phrasing stuck with me because the many people present in the room from the blockchain community she was speaking to were supposedly themselves part of the P2P community. After all, they were all working on P2P payment technology. McKelvey’s exclusive phrasing seemed to draw a sharp distinction between the blockchain advocates, with their seeming preoccupation with various money tokens, and the P2P community she identified with for whom P2P technology was a method of ensuring a digital commons. Another panellist, Mathew Slipper, offered that perhaps P2P technology was simply perceived as ‘less sexy’ than ‘ZKsnarks’.¹² Reading between the lines it is perceived as ‘less sexy’, less mysterious, but perhaps also less financially lucrative because it cannot be tokenized and thus used to generate profit, making it less attractive for developers and investors.

In examining the potential for cryptocurrencies as a commons, an alternative to private and state-issued money forms, Rachel O’Dwyer points out that the ‘peer-to-peer’ network topology of cryptocurrencies “suggests a relational and community-invested monetary form” (O’Dwyer, 2014, p. 3). This observation is not dissimilar to my initial understanding of McKelvey’s comments about who was considered members of the P2P technology developer community. However, O’Dwyer continues to make the argument that the design of Bitcoin aligns better with a libertarian than communitarian agenda, as it is “based on individual sovereignty, private property, rent-seeking and the free market” (O’Dwyer, 2014, p. 4). In Lana Swartz’s paper on the techno-economic imaginaries of Bitcoin (2018), she teases out some of these ideological contradictions contained within cryptocurrencies and examines the implications in terms of their functionality as a payment system. Providing a condensed historical review of the origins of Bitcoin through the

¹¹ DevCon is an annual conference for developers of the Ethereum blockchain.

¹² A form of ‘zero-knowledge’ cryptography deployed in some cryptocurrencies to ensure privacy.

cypherpunks and crypto-anarchists that brought it into being, Swartz identifies two overarching ideological veins within cryptocurrency. For Swartz, these represent two distinct but coinciding techno-economic imaginaries which are central to discussing the meaning of being a 'peer' in a peer-to-peer payment system, and perhaps more broadly as she posits, 'a peer-to-peer society' (Swartz, 2018, p. 623).

The first vein, *digital metallism*, follows the thinking of classical economic liberalism where money is understood as a commodity holding intrinsic value rather than a state-regulated value. Studying a particular libertarian community in the United States (US) of America, Finn Brunton (2017) noted this same antipathy to state-issued 'fiat' money, that value should not be regulated by the state but rather determined on free markets. Brunton realized that the 'value' of bitcoin and precious metals such as silver was not to be understood in a factual sense but in a visceral one; "this was a community where one "knew value" the way you knew it was hot outside or you were among friends: bodily, interpersonal, sensory, social knowledge" (Brunton, 2017, pp. 256–257). Swartz identifies the same underlying ideology among the crypto-anarchists, who advocate for liberation from taxation and state control. In this vision, crypto-currencies are a form of digital gold – hence the term 'digital metallism'. "Digital metallism" Swartz argues, "set the stage for Bitcoin to become, like gold, a speculative instrument rather than an everyday payment system" (Swartz, 2018, p. 632).

The second vein, *infrastructural mutualism*, presents a more 'cooperativist' vision for money technologies and society more broadly. Liberty is not about free markets but freedom of information, ensuring both access and privacy in communication. The movement comes from the cypherpunks, for whom it was privacy that ensured "individual and collective autonomy" (Swartz, 2018, p. 632). Swartz argues that this framing allows us to understand money as being fundamentally infrastructural; it is about ensuring free flow, movement, and transaction. As Swartz points out, the "technology through which this movement occurs is an important vector of relations that may produce either freedom or tyranny" (Swartz, 2018, p. 633). From the mutualist point of view, participants share collective responsibility for maintaining critical infrastructure for the common good so that there is no longer a need to rely on a central service provider.

While there may be fundamental tensions between these two imaginaries, they both operate within cryptocurrencies. The effects Swartz argues can be seen especially in two central conflicts: *token mining* and *token value* (Swartz, 2018, p. 634). While these may seem like technical details, Swartz illustrates how these conflicting imaginaries have fundamentally affected what it means to be a 'peer' in the 'peer-to-peer' payment system described in the Bitcoin whitepaper.

Mining Bitcoin used to be something that anyone could participate in. Each node, or peer, could individually contribute parts of their processing power to verifying transactions and maintaining the network. They would earn a few Bitcoin as compensation, which could then be used for transactions on the network. This was the mutual process of ensuring the critical underlying infrastructure that would allow for a secure digital payment system. However, as the value of Bitcoin increased, mining itself became increasingly lucrative. This increased competition led to the development and application of increasingly specialised hardware and the formation of mining 'pools' that aggregate computational power while only representing one node on the network. For the digital metallists, mining became an opportunity to accumulate Bitcoin which represented a "store of speculative value" (Swartz, 2018, p. 634). The opportunity to accrue personal wealth takes precedence over ensuring the communal infrastructure. O'Dwyer similarly describes how the "asymmetric investment of capital and computational resources" that comes with professionalisation creates barriers for participation (O'Dwyer, 2014, p. 5), and ensures that those with most resources reap the most benefits. The consequence is two-fold. Firstly, as described by Schneider, industrial mining leads to a centralisation of computational power and thus control of the underlying blockchain, counterproductive to the original vision. Secondly, it changes what it means to be a peer within this system. As O'Dwyer points out, the "peers in the Bitcoin network are non-human, not 'people power' in other words, but processing power, which is subject to a logics of scale and scarcity that prohibits any equal entry into the payments space" (O'Dwyer, 2014, p. 5). Where the P2P technology was supposed to secure non-hierarchical governance, in practice cryptocurrency mining introduces new hierarchies of wealth and power.

According to Swartz, the question of the value of tokens can be understood in two ways. Firstly, the value defined as *price*, or secondly, as a broader societal value by offering an alternative *means of payment*. For digital metallists, the emphasis on the value of cryptocurrency is contingent on its price in conversions to other currencies determined on the 'free market'. Cryptocurrencies are therefore an asset that you can invest in and hopefully become wealthy from even if it is at the cost of someone else. For infrastructural mutualists, the purpose was to establish cryptocurrencies as an ordinary payment option for everyday transactions, helping to ensure transactional privacy and freedom for everyone. The investment here, Swartz points out, is in the infrastructure and in becoming a community member. Ultimately, Swartz makes the argument that "speculation in Bitcoin as a commodity has overwhelmed and undermined its potential for use as an infrastructure of exchange" (Swartz, 2018, p. 637). While metallists might benefit from the price fluctuations that make for an exciting investment market, the same fluctuations undermine the viability of cryptocurrency to serve as an 'everyday' means of payment. In practice,

the currency cannot support the sort of 'peer-to-peer' alternative money system that some might have imagined for supporting communities and building digital commons.

I encountered an example of this during my fieldwork in Jogja. Far removed from the Ritz-Carlton ballroom in Jakarta, I was invited to attend what was described as an information evening on cryptocurrencies and blockchain hosted by an Indonesian cryptocurrency trading platform and a local 'tech hub'. The room was packed full of young students and for the first half-hour, an MC entertained the crowd with pop-quizzes, handing out crypto 'swag' in the form of keychains, t-shirts, and caps. Finally, the host of the evening took the stage and gave a five-minute account of what cryptocurrencies are; nodes, digital value, in existence for 11 years. The host asks the room how many have purchased cryptocurrencies before and 6 people raise their hands. Not to worry, tonight we will all learn how to trade crypto! There were two invited speakers. Both work for trading platforms and for the next hour we go through slides detailing how to earn money through micro-trading. The point is made that engaging with the bigger international, especially US-based conventional stock trading platforms is expensive and requires you to have a lot to invest. Cryptocurrencies are the cheap way to invest even small amounts, taking advantage of micro-fluctuations in the volatile market. One speaker assures us that he has been able to make a lot of money this way and reminds us not to become so obsessed with watching the market that we forget to sleep. After the presentations, the room is buzzing with questions about regulations, recommended tokens, mining set-ups, coding scripts to automate the micro-trading, the cuts that the platforms take for providing access, and what do they mean when the presenters say: 'do your own research'?

At no point in the evening so far has there been any conversation about the ideological or political values integrated with P2P networks. Cryptocurrencies are offered as a cheaper investment option making financial speculation more accessible to a certain group of people. I spoke about this with one of the invited speakers. She had grown up poor on an island between Sumatra and Java and told me that most cryptocurrency users in Indonesia were like her; young and *orang bawah*, meaning lower class, or quite literally the 'people below' looking for a way out of poverty. It feels far removed from the Ritz-Carlton ballroom, but also far away from the narratives of how cryptocurrency can enable people to transact outside of commercial payment platforms. The event ends as the MC takes the stage again, handing out prizes to those participants who arrived earliest for the event. "This is the future of Indonesia," she says, "people who are on time." She concludes by shouting "Merdeka!" into the microphone: independence! To the first movers who are able to take advantage of this new market hoping to change their position within the existing socio-economic hierarchies.

Private Transactional Communities

Both Swartz and O'Dwyer ask what does it mean to be a peer in the context of P2P networks, and more broadly, what does it mean to develop P2P payment systems? In the context of networks, peers are nodes and the term peer implies a non-hierarchical topology where each peer is an equal participant. Besides being an important practical design, as Swartz explains, it also has ideological significance drawing from a longstanding orientation towards 'freedom' through mutual responsibility for building and maintaining alternative infrastructures. O'Dwyer further points out that the design itself is suggestive of communitarian care to create and govern a shared resource in the form of digital money. However, the competing ideological veins, self-interest and the applied practicality of distributed governance mean that hierarchies (re)emerge, challenging the cooperativist vision of a non-hierarchical payments network.

Yet the social and relational understanding of the term peer and the idea of peerhood and P2P transaction is compelling and continually persists. It endures beyond the network infrastructures and cryptocurrencies and into commercial fintech products, where peers are no longer nodes but simply people. Whilst the distributed network is replaced by central intermediaries, the narratives of direct and disintermediated transaction perseveres. Companies provide digital platforms where peers can find each other for the exchange of services or transact money 'directly'. As exemplified through M-Pesa and other fintech companies seeking to engage new customers by providing financial services through mobile phones, "attempting to use the networks they have built to carry another kind of data – financial data" (Rea et al., 2016, p. 2). As expressed earlier, there is a deep irony in the fact that cryptocurrencies and commercial wallets both operate with the language of peer-to-peer whilst their underlying infrastructures for transaction are diametrically opposed.

There is an interesting parallel to be drawn here between the developments of the internet and these payment infrastructures. The early internet relied on an open and decentralised infrastructure to work, monopolisation of services means that our engagement with it increasingly takes place through centralised platforms such as Twitter, Facebook and Google (Srnicek, 2017). Where cash allows users to transact with limited barriers and transactional metadata – the original peer-to-peer payment system as Brett Scott (2017) argues – digital payment platforms increasingly control the circulation of value much like the internet platforms control the circulation of information. Lana Swartz provides a similar but alternative analogy of the transition from mass media to social media:

"The mass media era has been characterized by the unified, collective, passive experience of concentrated, unidirectional broadcast and print technologies.

The social media era has been characterized by a participatory, peer-to-peer, globalized, but also surveilled experience of digital media. Similarly, what we are seeing now is a shift from *mass money media* to *social money media*.” (Swartz, 2020, p. 18 original emphasis)

In this example, it is state-issued cash that is mass media and digital payments that operate similar to social media. As with commercial digital wallets, the P2P of social media refers to the process and direction of exchange rather than the underlying network infrastructure, and so the ‘2’ still refers to the intermediating platforms. Not only can these parallels be made, but as Swartz exemplifies, social media actors are at once introducing transactional tokens into their services just as payment platforms are introducing communication ‘feeds’, building ‘money technologies’ “according to social media business logics” (Swartz, 2020, p. 21). These logics relate to the harnessing of transactional metadata, but Swartz also points to things like terms-of-service agreements that make it difficult to understand, or to reject, the comprehensive data collection associated with their use. And of course, it is the prospect of this transactional metadata that also brings with it the type of financial investment known as venture capital, which as I will show in the next chapter, is heavily integrated in the business models of the Indonesian digital payment apps.

The intersections of communication and money are no novelty, the creation of P2P networks was originally about securing freedom of information flow including the circulation of money. As discussed earlier, money itself is a form of data, a technology for keeping account. Swartz describes how the communication that takes place through payment “knits us together in a shared economic world: a *transactional community*, by which I mean the set of relations that are produced by transactional communication” (Swartz, 2020, p. 16 original emphasis). Drawing on examples ranging from Indo-Greek coins to the modern Euro, to cryptocurrencies such as Bitcoin, Swartz points out how the money medium reveals things to us about the transactional communities to which we belong. The tokens convey a shared language as they are inscribed with imagery about our values, identities, geographies and histories (Swartz, 2020, p. 18).

To give an example, following the Indonesian declaration of independence in 1945, there was a major effort by the independence movement to issue a currency that could provide an alternative monetary system to that deployed by the occupying Dutch colonial government (Cribb, 1981). The introduction in 1946 of the *Oeang Republik Indonesia* (ORI) was for more than just creating an alternative mechanism for exchange. Decorated with images of the *keris*, a distinctive Indonesian asymmetrical dagger alongside part of the 1945 constitution text, the new currency was both a manifestation of the new Indonesian state and a rejection of the state authorities depicted on the

Netherlands Indies Civil Administration (NICA) guilder. In an act of deliberate incommensurability, there was to be no formal exchange rate set between the ORI and the NICA (Cribb, 1981, p. 131). Put another way, if “money is, as various scholars have asserted, like language, then transactional communities delineate who is able to talk to one another, to participate in the conversation” (Swartz, 2020, p. 17).

Thus, payment technologies are not simply economic tools but communication tools, Swartz argues, they are mechanisms that control the circulation of that communication in that their “politics are communication politics: who gets to control and profit from communication infrastructure, who gets to access it and on what terms, what kind of traffic gets to travel over it” (Swartz, 2020, p. 6). When digital payments increasingly resemble these social media apps, it is important to examine how they influence the communication taking place through the transactions on their platforms and how they can control those transactions. This is not just a question of transactional censorship, where certain types of transaction are prevented from happening, but about how certain forms of transaction can be enforced, for instance when only being able to use my GoPay credits with GoPay merchants. This type of earmarking of digital money, and the sequestration of digital money into certain digital wallets was predicted in 1996 by Viviana Zelizer when she wrote: “In the future, for instance, e-money may be issued privately by institutions other than banks. Because electronic money is software [...] it could be programmed for restricted purposes, to be spent only on designated purchases” (Zelizer, 1996, p. 493). In Zelizer’s research, she explores how people, governments and companies designate specific money for specific purposes, challenging the idea that a dollar is just a dollar. It may also be a very specific dollar, set aside by the owner to be used for a specific life event or a symbolic purchase. This practice of earmarking money extends also to things like benefits for poor people from governments that can only be exchanged for pre-determined goods. Once the money exists digitally, it exists within the programmable confines designed by its provider and its use can be limited to the goods and services made available within the same platform. This raises questions of what happens when money exists as tokens within the transactional ecosystems of platforms such as Gojek, and how they configure peerhood within their transactional communities, which I explore in the proceeding chapters.

1.4 Conclusion

Internationally, various iterations of peer-to-peer (P2P) transactions are gaining prominence. P2P here refers to a cashless transaction taking place directly between two people, through a technological intermediary that is not a conventional financial institution. Typically, it is promoted

as a financial product or service hosted by new actors within the payment space, such as the fintech or communication industry. It alludes to a non-hierarchical exchange. There is a lot of scholarly work within STS that examines the co-construction of users and technology (cf. Oudshoorn and Pinch, 2005; Suchman, 2012; Woolgar, 1991), but what happens when the users of a technology are specifically configured as peers?

In this chapter, I have shown how the social meaning of the term peer invokes ideas about socio-economic equality and mutualism, and how the category of peer always emerges in relation to someone else. In the case of P2P payments, supposedly the person on the other side of the exchange. This social meaning can also be seen in the former instantiation of the term P2P within computer networking, in which it was used to describe a distributed network of nodes exchanging information bi-directionally, without passing through a central server. The use of the term here evokes ideas associated with infrastructural mutualism (Swartz, 2018), which persist even when these networks required more hierarchical governance in practice, as evidenced by the use of language such as 'ultra-peers' (Schneider, 2019). The creation of P2P networks is not just an important practical choice, for its participants, it is also an ideological identity, one that has to do with being equal contributors in facilitating the exchange of information.

In this thesis, I conceptualise digital money as a technology for keeping account, drawing on literature from economic anthropology emphasising the role of money as making visible social relations, and materialising credit and debt relationship in token form (cf. Graeber, 2011; Maurer, 2012; Strathern, 1992). In its digitalisation, this account is controlled by banks and payment processors. When money exists as numbers in a database, users trust these intermediaries to update their records to accurately reflect the transactions. This has led some to express concern about the centralisation of authority and transactional surveillance through the privatisation of digital payment. Drawing on the P2P network technology, actors from the cypherpunks movement attempted to develop public alternatives for a digital payment network (Brunton, 2019). The commonly known example of this today is the Bitcoin blockchain, which relied on a distributed network of nodes to validate transactions using cryptocurrency instead of a central actor such as a bank. However, competing ideological veins and practical challenges with decentralised governance mean that the dominating characteristic of these new forms of money came to be as a speculative asset. Subsequently, the costs of participating as a peer on the network increased, resulting in increasing professionalisation and centralisation (cf. Brekke, 2020; O'Dwyer, 2015b; Swartz, 2018).

In the context of cryptocurrencies, being a peer refers to being a contributing network node, and it is this network of peers that theoretically enable the infrastructure for digital payments to exist.

However, in the case of P2P payments, as implemented through fintech, the peers are not contributing to the network, they are the exchanging parties. This brings us back to the early question, what does it mean to be a peer in the context of P2P payments, and how do the intermediating infrastructures configure the peerhood of their customers?

Through their technological platforms, these fintech actors can establish their own private transactional communities (Swartz, 2020). Within these communities, money exists within the programmable confines designed by the fintech actors themselves. The fintech actors can define the conditions of exchange taking place through their infrastructures, literally encoding parameters for money to control exchanges: who can transfer money, to who, when, and for what? They determine not just the price of services bought through the platform, but the cost of the service itself. This can be through the imposition of fees or 'cuts' on transactions, but also the transactional metadata itself (O'Dwyer, 2018). As our payments take the form of data transfer, our exchange relationships are increasingly quantified and can be monetised to benefit these same companies. This creates incentives for the fintech companies to keep people transacting within these private money infrastructures rather than outside the system using cash (Maurer, 2012). These companies not only define the conditions of circulation of money within their platforms, but they can also influence the conditions of exchange between the transacting parties. Calling the technology P2P implies that the exchanging parties are equals, or at least configured for peerhood in the exchange. In the rest of this thesis, I examine the case of the Indonesian payment apps, and the conditions for exchange they impose upon their users, how they influence the dynamics of the exchange, and either reinforce or introduce new digital hierarchies of transaction.

VISIONS OF A CASHLESS INDONESIA

2.1 Introduction

In February 2019, incumbent presidential candidate President Joko Widodo (commonly referred to as Jokowi) posed a question to his opponent, General Prabowo Subianto, during a televised debate.¹³ The question was: what infrastructure would Subianto build to support the development of Indonesian unicorns? Subianto steps forward to the microphone, and, seeking clarification on the nature of the unicorns, asks “meaning the online thing?” Jokowi nods without elaborating, and laughter at Subianto’s expense is heard in the television studio. The foreign term ‘unicorn’ stems from venture capitalism and is used to describe start-up companies valued at over 1 billion US Dollar (USD), and as of early 2021, there are 6 in Indonesia.¹⁴ Even as the debate continued, Twitter flooded with smug memes of Subianto riding unicorns.

It was a revealing moment for both candidates. Positioning himself as the champion of what he calls Indonesia 4.0 (Ministry of Industry, 2018), Jokowi emphasised his efforts for a digital transformation of Indonesia’s production. He supported increased access to 4G internet, reforms to provide a more friendly regulatory environment alongside supportive incubators for new tech start-ups. Subianto instead chose to frame the burgeoning e-commerce sector as a challenge for financial sovereignty, presenting his concerns that the great enthusiasm for “e-this and e-that” would only hasten the flow of money and business out of the country. Subsequent unicorn memes from digitally connected Indonesian ‘netizens’ underline the seeming divide between those who see themselves in a digital Indonesia, and those who, like Subianto, feel left behind by the

¹³ The moment is captured here: <https://www.youtube.com/watch?v=nPO4lp9dSoU&feature=youtu.be&t=534>

¹⁴ Gojek (The Jakarta Post, 2019a), Tokopedia (Mulia, 2018), Traveloka (Lee, 2020a), Bukalapak (The Jakarta Post, 2018a), OVO (The Jakarta Post, 2019b), JD.id (Florene, 2020)

emphasis on future digital developments.

This debate occurred around the halfway point for my empirical data collection. It was striking to see the same tensions among interlocutors ranging from government and company representatives to online drivers and customers in Jogja. The increasing emphasis on technological innovation and infrastructural development to support this growing digital industry was a prominent part of public conversation. Yet the debate was fraught with concerns about growing economic inequalities and disparities of access to these new infrastructural developments. In this chapter, I present some of these socio-economic and infrastructural developments and the more recent political and legislative transformations that form the context of the digital economy that exists in Indonesia today.

In the first section, I examine how infrastructures of connectivity, such as mobile phones and the internet, converge with infrastructures of digital money to form 'e-money' which increasingly dominates the Indonesian digital economy. I conclude this section by presenting three key policy developments pertaining to e-money which represent specific visions of a modern, digitally networked and cashless Indonesia.

In the next section, I centre on two of the Indonesian unicorns that Jokowi was referring to, now decacorns,¹⁵ which were the focus of my data collection. I will show how they emerged and rapidly developed even within the brief timeframe of my research to converge digital technologies familiar from the gig economy with financial services, commonly referred to as financial technologies or 'fintech'. My purpose here is to show how these fintech actors have positioned themselves centrally in the digital economy. How they present themselves and their product to expand into broader financial services, specifically targeting those considered 'unbanked,' who have not traditionally had access to formal financial services.

2.2 Converging Infrastructures of Connectivity and Money

One afternoon in Jogja, I visited the nearest Bank Central Asia (BCA) branch in my neighbourhood to pay an invoice to a woman living in Bogor, another city. Upon receiving the invoice, I was reminded of how quickly I had grown used to the ease of digital payments in my daily life in Denmark, where normally all I would have to do to complete this payment would be a swipe from my phone. At the bank, a friendly security guard took pity on me and helped me identify the correct paper forms to fill out, even helping me to decipher the unfamiliar financial vocabulary.

¹⁵ Meaning they are valued at over 10 billion USD.

When it was my turn at the counter, I handed the paper form to the clerk and nodded at the EDC terminal on the counter, asking if I could make the payment using my credit card. Glancing at my foreign card, he shook his head and said it would only work if I had an account in this bank: “We don’t have a digital system yet” he offered as an explanation. I handed him about 1,800,000 rupiah (Rp) in cash, a substantial amount, and then went directly downstairs to withdraw the same amount from the ATM. Later that evening, I received a confirmation email from the woman in Bogor. It felt like I had experienced a momentary glitch in the system. I felt fairly confident that the stack of notes I had delivered had not been physically transported nearly 600 kilometres to Bogor that same day. The money I had deposited had simply been digitally credited to her account by the bank, while the cash stayed in Jogja. Yet it seemed strange emptying cash-out of my wallet, only to then replenish it from the ATMs owned by the very same bank because the system was ‘not yet digital’.

The glitch felt like a brief insight into the state of connectivity and disconnection of the socio-technical system of digital payments in Indonesia. Such a system comprises multiple interlocking elements; physical and legislative artefacts, policies, institutions, and even specific people. All together they create “an integration of the technical, social, and political aspects” that comprise ‘digital payments’ in Indonesia (Bijker et al., 2012, p. xlii). As the system derives its characteristics from all of these components, it is important to broaden the analysis beyond the specific artefact itself and to understand the elements that they are comprised of (Hughes, 2012). The digital payment apps in Indonesia did not emerge in a vacuum, rather they were developed in relation to a range of conditions and can be said to embody the same technical, social and political aspects. There are various forms of digital payment in Indonesia serving different purposes and providing for different types of people. The form of digital payment materialised in a ‘digital wallet’ via a smartphone app is not an inevitability, though it is becoming increasingly dominant. Thomas Hughes (2012) describes how technological systems do not develop autonomy. They gain momentum as organisations and people become committed to or have a vested interest in the growth and durability of that system. These apps therefore cannot be examined in isolation and attention must be paid to the ways in which they, in turn, impact society.

In this section, I first present a brief examination of two central infrastructures for digital payments: connectivity and money. These digital payment apps rely on the use of the internet through smartphones. Exploring what ‘the internet’ looks and feels like in Indonesia provides an important analytical starting point for understanding their use. Similarly, examining characteristics of the divisions occurring between those with and without access to smartphones makes tangible what types of exclusions might stem from a digital economy grounded on

smartphone use alone. By exploring what digital money has typically meant in an Indonesian context, I explore the characteristics for payment imposed by so-called 'plastic money' in the form of credit, debit, and ATM cards, and how they impose conditions and traits identifiable in the payment apps used today. I also present the moment when 'e-money' was legally defined as a separate category of digital money, and how this defined the companies creating these apps as the 'issuers' of digital credit and the user as the credit 'holder.' This section shows how infrastructures of digital money and the telecommunication industry converge into what is now considered e-money, or a type of 'peer-to-peer' (P2P) money that can be transferred via mobile phone without having to make a bank transfer. I end this section by presenting three specific policy initiatives from the Indonesian government and central bank, all of which convey a vision for Indonesia as a modern, digitalised nation. These policies are the Making Indonesia 4.0 strategy, the National Non-Cash Movement, and the National Strategy for Financial Inclusion. My goal is not to provide an in-depth analysis of these initiatives, but to provide political and ideological context for the conversations surrounding the digitalisation of payments in Indonesia, and the arguments about financial inclusion that are often leveraged in support for this transition towards a 'less-cash society'.

Fragments of Connectivity

In her analysis of the constraints and developments of mobile money in Indonesia, Kathleen Azali (2016) describes the major institutional and infrastructural challenges that followed the Asian financial crisis and political upheaval in 1998 after the removal of President Suharto. The subsequent political reforms and process of decentralisation resulted in a complex rearranging of mandates and financial flow between national and sub-governmental units (Klinken et al., 2009; Nordholt and Klinken, 2007). Azali describes how this often led to overlapping, conflicting and fragmented chains of responsibility, rife with "ever-shifting overt and covert alliances of political and economic actors, now dispersed not only down to sub-national governments, but also to ever-shifting market forces" (Azali, 2016, p. 365). Azali argues that this is part of the cause for highly uneven communication and financial infrastructural development in Indonesia: that most of the Indonesian population has never had access to a landline phone or a local bank branch. In the introduction to their edited book, *Digital Indonesia*, Jurriëns and Tapsell also express this disparity within Indonesia:

"A person's social or physical position in the geo-political landscape of Indonesia, with its highly uneven spread and quality of digital infrastructure, to a large extent determines whether, how fast, how long, with whom, and on what other terms and conditions one can have digital connectivity." (Jurriëns and Tapsell, 2017, p. 5)

Similar to the landline, most people in Indonesia today do not have access to broadband internet, relying instead on access points to Wi-Fi and data packages for smartphones (Purbo, 2017). The more widespread use of mobile phones was also preceded by the intersecting political events of the '80s and '90s. These were contributing factors to the deregulation and commercialisation of the telecommunication industry that reduced the costs of both phones and airtime (Baulch, 2017). However, access to these types of infrastructure is not evenly distributed, even if there are claims of having provided mobile network access in remote areas. There is a disparity between connectivity initiatives and the lived experience of being connected, "leaving many deprived areas unconnected, as is the case in Indonesia" (Lim and Nugroho, 2011, p. 1). Part of the reason for this is not just regional economic inequalities, but also logistical challenges that come with the geographic characteristics of implementing communication infrastructure across Indonesia (Rohman and Bohlin, 2011).

As the digital payment apps rely on access to the internet, it is worth examining for a moment what 'accessing the internet' means both practically and symbolically in Indonesia. Media scholar Merlyna Lim has written extensively about the emergence and use of the internet in Indonesia since it became commercially available in the mid-1990s (cf. Lim, 2018a, 2005, 2003). Lim's work conceptualises the internet as an infrastructure, which for her means to understand not just what people do with the internet, but how they can engage with it. This allows for an analytical lens focusing on the study of 'symbolic action' (Larkin, 2013) as materialised in the infrastructure: "Understanding the nature of Indonesia's internet infrastructure [...] necessitates "going backstage" to unfold the political and social choices that have been made in its development" (Lim, 2018b, p. 158). For Lim, these infrastructures can be understood as "embodiments of social and cultural relationships that, in turn, shape and structure the possibilities for social actions and cultural expressions" (Lim, 2018b, p. 158). I want to draw attention to her emphasis on the physical spaces in which people are able to access the internet through the major shift that came with smartphones.

When the internet first became commercially available people in cities could access it by visiting a *warnet* - a type of Indonesian internet café. *Warnets* are a place where you can easily purchase snacks and drinks, chat with friends and generally hang out. Thus, accessing the internet began fundamentally as a social activity. But access to the internet also came from a politically activist agenda. Lim details how early internet activists such as Onno Purbo and Zilmy Zamfarra went to great effort to spread public access to the internet specifically as a means of communication outside of the state's control (Lim, 2018b, pp. 160–161). The emergence and spread of the internet in Indonesia coincided with a time of political turmoil, and by the end of the '90s, a major

transition of power as Suharto was forced to resign: “Purbo and his friends’ guerilla-style, bottom-up internet networks were disruptive. They challenged the state imaginaries of controlled, centralized, and capital-intensive networks of communications” (Lim, 2018b, p. 161).

By 2011, Lim describes how the *warnet* model of internet access has changed. Users gained access to affordable mobile networks and phones, and wireless hot-spots became available in “schools, universities, parks, cafés, restaurants, and convenience stores” (Lim, 2018b, p. 162). One of my interlocutors explained that she never actually needed to buy data packets because she would simply stay within range of a hotspot whenever she needed to make an order with the Gojek app. I deployed a similar strategy before getting a local SIM card, loitering outside Starbucks hoping to get enough connection, while still being in viewing distance of a driver arriving to pick me up. This is a really important detail about the internet in Indonesia: the vast majority of the population rely on their phones to access the internet, rather than a computer. As Lim writes:

“Of the country’s 132 million internet users in 2017, 92 million of them went online using smartphones. With a mobile penetration rate of over 90-percent and the total number of mobile phones exceeding the actual population, mobile internet has become an obvious choice for most Indonesians.” (Lim, 2018b, pp. 162–163)

In 2018 new regulations changed the conditions for purchasing SIM cards in Indonesia. Preceding this, you could simply buy a SIM card from a street counter without any further need for documentation. Now, SIM cards are required to be registered in accordance with formal ID, either the personal identity card *Kartu Tanda Penduduk* (KTP) or family ID, *Kartu Keluarga* (KK). Furthermore, each operator was only allowed to issue 3 phone numbers per person, and a recent conversation has begun regarding the possible use of biometric data for registration to prevent ‘SIM card fraud’ (Arifin, 2020).

During fieldwork in Jogja, I purchased a second phone to use for my research. At the store, I asked the clerk whether he knew where I could purchase a SIM card because I had only been able to purchase my first SIM card at the Jakarta airport using my passport as ID. The clerk and his colleague discussed and established that I did not have a KTP. The clerk told me I could buy a SIM card around the corner, and that he would help - they had “a trick” to get around the registration problem by registering my number on his KTP. As we walked out of the mall, he described the new rules to me that required everyone to register their SIM cards. I asked him what happens if for some reason do not have an ID. He laughed and told me that you just borrow someone else’s, like we were about to do. Five weeks later, my SIM card stopped working, perhaps de-registered to make space for someone else.



Figure 4: Data packages for sale at three different counters

As a foreigner, it felt overwhelming to purchase SIM cards and new data packages every month when the old ones expired. As illustrated in Figure 4, visiting a data seller would invariably involve an extensive number of choices. In an interview, my local data seller teased me about my confusion but suggested that there were too many variants of the data products. He estimated that each MNO, referred to locally as *telcos*, had between 15-20 products. Sweeping his hand over the glass counter he told me he had at least 150 different products for sale. Laughing, perhaps at my incredulous facial expression, he suggested that *"kebingunan adalah kendali"*: confusion is control. Each month customers would come back to renew their data package, only to find that that specific type of package no longer exists. The seller buys the cards himself directly from company dealers, and they are delivered to his roadside stall. It is a risky investment because cards can 'expire' if the type of package goes out of circulation, after which the seller cannot return them. Some cards are also pre-activated (e.g., for two months). He joked that for customers like me who do not know what they want, he pushes those cards. He mimicked a sale with his arms saying *"Ini pilihan bagus!"*: this one is a great choice! For some of my younger interlocutors attending university, the idea of going to a physical counter at all seemed almost quaint, or "interesting," as one put it when I showed him one of the above images. Instead, many simply topped-up their data packages and pre-paid phone time credit known as *pulsa* via apps using digital payments.

It is worth noticing the details on the Telkomsel SIM card depicted to the right in Figure 4, which shows the data package I bought together with the phone shop clerk. First, I paid a one-time fee of Rp 55,000 for 9GB of data. The handwritten card specifies that 500MB are for national use. 4.5GB can only be used in the regions of Jogja, Bantul, Sleman and Wonosari. 2GB are allocated for social media, specifically Facebook, Instagram, WhatsApp and Line. And finally, 2GB are reserved

for the Telkomsel streaming service VideoMAX. Many data packages come with pre-allocated data for social media, and many packages were even sold with the premise of providing 'unlimited' data for these services. As a user myself, it was the first time that I experienced a warning before leaving those platforms, in the form of a notification that I would be using my data if I navigated away. Initially, I felt a bit cheated by this arrangement in that I had paid for 9 GB only to find nearly half of it tied to specific uses, a frustration similarly shared by some of my interlocutors. In a focus group, one student described how the card he bought in Jogja, was not valid when he travelled to Kalimantan to do research:

A1: Back then I used to buy Telkomsel, for how much?... around 7,5 or 8 gigabytes, when I used it in Kalimantan, it can only be used for 1 GB, the rest was only applicable in Jogja.

A2: What a waste...

A1: And it was a waste. And the internet over there happened to have limited connection, because the only provider that worked in Kalimantan, especially in the remote areas, was Telkomsel. The others wouldn't work.

[FGD 2]

The restrictions on SIM cards forced him to unregister and later re-register for a new number to get internet access when in Kalimantan.

Though there is a huge variety in how much data people can buy in each package, the data seller told me that the thing that was most important to his customers was the "*masa aktif kuota*": the period in which the package is active. This can range from just one day to three months, to a year, depending on the operator and package type. When I brought up my frustration about having paid for GBs that I would never use in my data package, the seller told me that this was only partially correct. I had paid Rp 55,000 for the 5GB of national and regional mobile data as stipulated. The remaining 4GB for social media and video streaming were usually deals that had been made between companies and were provided 'free' to the end-user. It was just in the marketing that they would add it all up to make it look overall like a larger data package, which of course might also make customers willing to pay a bit more for the base data. Regarding the distribution of regional and national data, the seller explained that this was a recent development due to variations in cost for providing coverage in different locations. For example, providing data in Irian Jaya is more expensive than in Jogja. In the past dealers would ship any packages they had not been able to sell and which were in danger of expiring, to dealers in these more remote areas. The seller theorized that these new restrictions on geographic use were the companies' way of cracking down on this practice because it was bad for business.

Whilst new regulations were limiting SIM card registration the data seller told me that people were still often switching both to new SIM cards and to new data packages. Customers are not very loyal to these brands opting instead for whatever current deal is available, as the data seller puts it: “*Ya itu, ‘cheap’ adalah kata kunci*”: cheap is the key word. One interlocutor shared with me that she kept two phones, one with a fixed SIM card, and a second for data packages. In this way, she could simply replace the SIM card when the package ran out, taking the opportunity to benefit from promotional offers, *promo’s*, which besides data discounts could include things like a voucher for McDonald’s or Dunkin Donuts. This was the most economical method for her because her small children consumed a lot of data by watching YouTube and playing online games on her phone. The data seller confirmed that this is common. Many people will have a regular feature phone for phone calls, then a smartphone for communicating via WhatsApp and for using social media.



Illustration 1: Purchasing data packages at counter

Social media use is a critical part of online culture in Indonesia, and as Lim points out, “‘connecting to the internet’ in an Indonesian context mostly means accessing social media, such as Facebook and Twitter” (Lim, 2018b, p. 163). Lim writes that for users of services such as Facebook, many may not even realise they are using the internet when doing so. Several of my interlocutors reiterated the importance and value of social media in their daily lives. They explained that with

limited storage space in their phones they would rather prioritise apps such as Instagram and WhatsApp over having multiple apps for digital payments. While access to cheap smartphones has increased access to the technology, for many interlocutors their lack of memory and storage space made them unreliable tools for financial transactions. This is important to keep in mind in the context of digital payments that rely on the use and access of both smartphone-based apps and the internet to complete transactions. In 2018, Indonesia was already the fourth largest population on Facebook with 130 million users (Septania, 2018). The fact that Facebook and its subsidiaries Instagram and WhatsApp are such dominant access points for the internet for many Indonesians, is worth keeping in mind as these same companies have begun to make major investments into the Indonesian digital payment ecosystem explored later in this chapter.

According to Lim, the social element of internet access is not just a historical characteristic. Lim points to two examples of how being online is something that you do together. She uses the term 'cyber-urban space' to address the binary categories of 'online' and 'offline'. "More than just a point of access, *warnet* are technosocial spaces offering access not only to technology, but also to social spaces centred on internet technology" (Lim, 2018b, p. 164, original emphasis). What Lim found in her more recent interviews with smartphone users was that places in which Wi-Fi could be publicly accessed were also often 'hybrid spaces' where young and urban people could hang out physically and be 'online' together (Lim, 2018b, p. 169). However, as Lim argues, this type of 'technosocial space' is still distinct from that of the *warnet*: "In comparison to the *warnet*, these access points are much more exclusionary. Rather than democratizing access, this shift away from *warnet* has pushed the infrastructure of access to reflect the existing inequalities and social divisions that already permeate the physical urban geography" (Lim, 2018b, p. 167, original emphasis). There is a real barrier to access for many people because it is expensive to go to a coffee shop to access Wi-Fi and making it a form of access only reserved for some of the population. For Lim, this development of internet infrastructure represents a transition away from collective to a more individualistic use of both technology and the internet infrastructure, re-entrenching the pre-existing socio-economic inequalities.

The data seller pointed out that many people keep a feature phone, the smaller phones with less complex operating systems that do not usually enable internet use, to store a stable SIM card for phone calls and SMS text messaging as well as an alternative smartphone to connect to the internet. It is worth examining how those two distinct mobile technologies can also be representative of a form of 'digital divide'. In an analysis by Emma Baulch (2017) the deregulation of the telecommunication industry in the '80s and '90s first brought televisions, and therefore also television adverts out into the homes of Indonesians. Baulch makes the important observation

that it was the major Indonesian telcos that were, and continue to be, some of the biggest television advertisers. The use of this medium is to “render their products and services into commodity form – that is to make them marketable and desirable” (Baulch, 2017, p. 43), aimed at a broad portion of the population that had not previously been connected to the communication network. Baulch’s analysis is concerned with how these advertisements convey diverging visions for what it means to be a participant in a digitally networked nation and reveal a society in flux. She argues that there is a clear distinction between the vision presented in advertisements of those users who continue to rely on feature phones and 2G networks, and the modern and sophisticated smartphone user who is familiar with social media, reliant on Wi-Fi and data package products. Baulch argues that these depictions reinforce both ‘class-based distinctions’ and “the portrayal of the digitally networked nation as a sharply hierarchical society” (Baulch, 2017, p. 47). A society in which the citizen becomes a consumer who can aspire to ascend to a different societal level through their ownership and use of phones and corresponding telco products. While my research takes place in an urban setting where public Wi-Fi feels ubiquitous, it is important to reiterate that the quality of access is not evenly distributed across Indonesia. Inequalities of access and the divide between feature and smartphone users also impose particular limitations on the conditions for participation in the digital economy. The idea that the use of technology can organise social life into social hierarchies is one that several of my interlocutors expressed in various ways. I will return to this argument alongside expanding on the interconnecting ideas of a modern middle-class smartphone user in chapter 3.

The Convenience of ‘Plastic Money’

For most Indonesians, making a ‘digital’ payment has generally meant using a debit card to make a payment at a shop or an ATM card which, aside from making withdrawals, allows users to access their bank accounts to make transfers at an ATM. Having access to a bank account is not a given in Indonesia and within the minority that has access to a bank account, only a minority also own a credit or debit card. According to the Global Findex Database, only 2.4 per cent of the adult Indonesian population had a credit card in 2017 (Demirgüç-Kunt et al., 2018). Though recent political actions have helped to increase interoperability between banks and led to increasing use of plastic cards as a means of payment, customers using infrastructures from banks other than their own will still face substantial fees (Azali, 2016). In a focus group with online drivers, they pointed out that they would never use payment terminals, such as the card readers seen in Figure 5, because they perceived them as too expensive precisely because of these fees. Consequently, many places offering non-cash payments provide multiple terminals so that customers can select the machine that corresponds with their bank. I encountered other similar examples where

people described the use of such machines as being associated with extravagant spending. In the focus group of women who used peer-to-peer lending services, one woman joked about terminals. Swiping her hand in the air, while making the sound, 'zip zip!' Another woman explained further that cards had frivolous connotations; "It makes you wasteful, you just swipe around." Regarding the purported convenience of cashless payments, the women in the group agreed that it certainly would be very convenient to have the type of wealth that would allow them to use a card at all.



Figure 5: Each bank and payments provider issue their own card reading terminals, leading to cluttered counters and metal 'terminal trees' as can be seen in the bottom photo.

Throughout my fieldwork in Jogja, the centrality of the ATM as an infrastructural hub for digital payments became increasingly clear. The ATM is not just a place for extracting money - it allows users to perform a further variety of financial transactions. One interlocutor, a student at Universitas Gadjah Mada, described the ATM as being much more flexible than mobile-based apps. The ATM infrastructure allowed him to access and use his money anywhere - whether in Jogja, visiting family in Cirebon, or doing research in Kalimantan. In contrast, mobile apps could be unreliable because they depended on network coverage and were limited in ability to channel money where needed. The ATM allows you to make transfers to other bank accounts and also to make payments for purchases made online. For instance, when shopping online, users without a payment card can opt to make an ATM transfer. The website issues a numerical code and a

countdown timer. The user can then access their account at an ATM and input the code within the designated time to complete the purchase.

The importance of the ATM was also made clear when I asked the women in the focus group if they owned or used a bank account. One woman told me she had a bank account, but that it had never been used for any transactions and was abandoned. Other women in the group described that they had bank accounts, but that these were only used for receiving social assistance from the government. One woman was the holder of a 'Prosperous Family Card' (KKS – *Kartu Keluarga Sejahtera*) and would receive a monthly notification that the social assistance money had entered her account, after which she would 'swipe' the card at the ATM to withdraw her money. What struck me retrospectively in this interview, and multiple other encounters with interlocutors, was that rather than refer to their bank accounts they would simply speak of ATMs as both the ATM withdrawal card, the bank account, and even the machine itself. For instance, in this exchange, when one woman in the interview tried to explain to another how she could use the ATM to make money transfers:

A1: Oh, you use your ATM? Oh...

A2: So, my ATM – what matters is I have money in there.

[FGD 1]

I first recognised this multiplicity of phrasing during a focus group interview with online drivers, where a driver suggested that the only reason for him to ever visit a bank and stand in line at a human teller, was if he had 'lost his ATM'. Confused, and perhaps imagining that he meant that a local ATM near him had closed, I ask him to clarify:

A1: [...] We usually line up for a lost ATM.

Q: What do you mean by 'lost ATM'?

A1: When we lose our ATM.

A2: Gone. Either dropped, left at the ATM and we forgot to pick it up.

[FGD 3]

Of course, as his friend helpfully clarified, he was referring to his ATM withdrawal card. Looking back on my experiences, I was able to identify many situations in which drivers had used the same language, referring not to their bank accounts, but their 'ATM'. One such example came in an interview with a Gojek driver who had sold his driver account after becoming disillusioned with the business. The problem was that he had been using an account registered in his brother's name, and his brother had recently died. This made it impossible for him to change the associated bank account without revealing that he was in violation of the terms of agreement for using the platform. He had been forced to sell his 'ATM', meaning that the new owner took over both the

driver account in the app and the affiliated bank account so that he would be able to withdraw his earnings. As with these other examples, many drivers did not talk much about the bank, their relationship was to the ATM and the ATM withdrawal card that allowed them to access their digital earnings.

The emphasis in all these examples is not on digital money itself but on the ability of the ATM to transition money from being 'online' to being tangible. In a context where most transactions take place using cash, the ATM is a critical tool for materialising digital forms of value, and thus an important infrastructural component enabling a digital economy, which I illustrate in the last two chapters of the thesis.

In practice, the majority of transactions in Indonesia take place using cash. Nevertheless, Indonesia is currently experiencing a boom in the e-commerce industry through the use of apps and platforms such as Shopee, Bukalapak, or Tokopedia (Pangestu and Dewi, 2017). Since these services cannot rely on card-based payments, and for the most part they do not have their own integrated payment systems, Indonesians have a myriad of alternative solutions for making payments for digital purchases. Besides ATMs, there are Cash-on-Delivery services, manual bank transfers, or the use of one-time codes that can also be used to make the payment at a designated agent.

The women from the focus group interview all had smartphones yet never used them to make digital payments through app transactions. Instead, they would use ATMs to make transfers depending on their balance. Alternatively, if their money were in cash form they would visit a local money-transfer agent. Several companies offer 'digital' money transfers in Indonesia and I interviewed an agent who worked for a service called TrueMoney. TrueMoney recruits local people from the community who already hold a position of social centrality or trust. In this case, the owner of a small neighbourhood store that his family had managed since the '80s. After being recruited, he was equipped with a payment terminal and given brief training in how to use it to connect to other TrueMoney agents. Once a week, a company representative would visit him so that he could exchange cash for a digital balance, which he could then 'sell' back to his customers. For instance, a customer might want to send money to a relative, or as payment for a service in another location. They would pay the agent in cash and he would then transfer the equivalent digital balance to the local agent. The intended recipient could then visit their agent and receive the money in cash.

Another example of converting things into more tangible forms of value, albeit still not cash, is the use of phone airtime credit, *pulsa*. In Indonesia, *pulsa* can be easily purchased at roadside stalls

and only requires the phone number of the recipient and cash payment. This means that in practice you can pay for airtime to be loaded onto someone else's phone. Some interlocutors that I spoke with described being paid using pulsa. One, a gamer, would collect 'gold' in computer games and then send them to customers in-game in exchange for pulsa. The gamer's customers would simply go to their local counter and provide his phone number, spending the amount of cash they had agreed in advance that the 'gold' would cost:

[I had] too many that I didn't know how to spend them. So, I sell the pulsa. I use the pulsa transfer system owned by the operator itself. I use that system. But I sell them at cheaper prices. Usually, to top-up 100 the price will be 100 or 105, but for a pulsa transfer, I sell it for 90 to 80 or 85.

[Interlocutor 1]

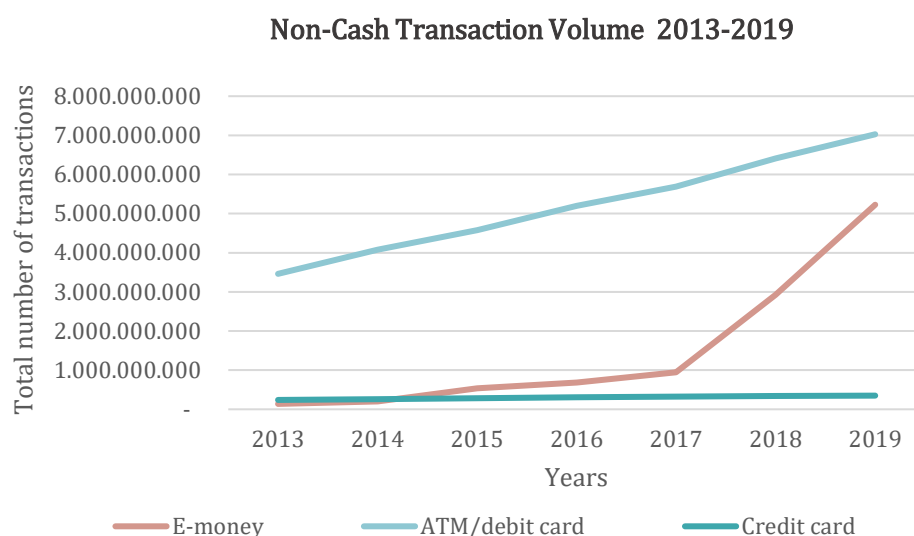
Where the formal vendor would sell a fixed amount of pulsa for Rp 100,000, my interlocutor would transfer his pulsa to others in exchange for cash. Though he was undercutting the price of the formal vendor, this method allowed him to convert digital 'gold' into tangible cash and make a profit from gaming.

Another interlocutor, working as a driver for an online transport app explained that if customers did not have enough to pay for a trip, he would give them his phone number so that they could make the payment using pulsa instead. Pulsa was an important resource in his job as an online driver because for almost every trip booking he would call the passenger in advance as a form of manual order confirmation to supplement the confirmation in the app.

This brings us to an important mechanism for payments in Indonesia, where it is common to 'top-up' or refill various types of accounts. You 'top-up' your pulsa in the same way that you can refill your electricity meter by paying cash at an agent, or fill up your water container, or your printer cartridges through various service providers. The broader term used for this is *isi ulang*: to refill. This is also the basic premise for most digital payment options in Indonesia today, beginning with the emergence of prepaid cards which are issued by commercial banks as an alternative to debit or credit cards. For instance, one might use a "Flazz" card from BCA to access the cashless toll roads in Jakarta or mall parking lots. You might use an "e-money" plastic card from Bank Mandiri to purchase things from a designated vending machine. By allowing users to 'top-up' their cards through cash or bank transfers, users were able to make cashless payments. However, they are also a vulnerable way to store your money, in the sense that if you lose the card, you also lose the money that was stored on it. This mechanism of topping-up a credit balance is replicated in the app-based digital wallets that dominate digital payments in Indonesia today.

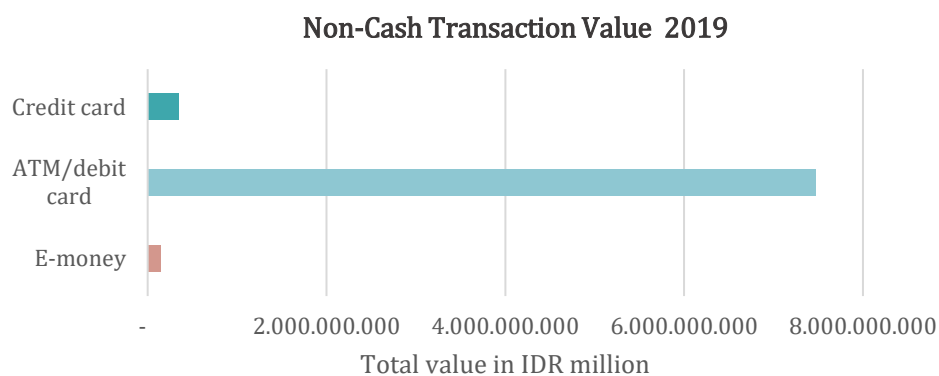
E-money: Issuers and Holders

Between 2007 and 2012, all three major telcos in Indonesia, Telkomsel, Indosat and XL Axiata, leveraged their existing communication infrastructures to provide channels for transactions. They issued their own forms of mobile money: T-Cash, Dompetku, and XL Tunai respectively (Azali, 2016, p. 368; BI, 2021a). Indonesia was not the only country to see this convergence of communications and money infrastructure in the emergence of mobile forms of money. In Indonesia, this new type of mobile money, which was distinct from the digital ‘plastic money’ came to be legally defined as *electronic money*, or e-money. The figures below give a sense of how this emergence of e-money changed the landscape of digital payments in Indonesia. They show transaction data compiled from the central bank, Bank Indonesia (BI, 2020a, 2020b) for three forms of digital money: credit cards, ATM and debit cards, and e-money.¹⁶ In Figure 6, we see the volume of transactions made between 2013 and 2019. Firstly, the data confirms that credit card use is limited and that the use of ATM and debit cards has been steadily growing throughout the period. E-money has limited use, until 2017 when the number of transactions began to rapidly increase, its trajectory even nearing the volume of ATM and debit cards.



*Figure 6: Non-Cash Transaction Volume 2013-2019
(Source: BI, 2020a, 2020b)*

¹⁶ Following a website restructuring, these statistics are no longer publicly accessible on the BI website. The data originally drawn from these public sites can be viewed in appendix 3.



*Figure 7: Non-Cash Transaction Value 2019
(Source: BI, 2020a, 2020b)*

Looking closely at the value of the transactions in 2019 displayed in Figure 7, the use of e-money has increased and now constitutes the equivalent of just over 10 billion USD. The value of those transactions is incomparable to the value of transactions made with the more conventional ATM and debit cards. In fact, despite only being used by a minority of the population, the value of transactions with credit cards exceeds the sum of all the e-money transactions in 2019. This is a clear indication that though e-money may be used more frequently, it is currently more likely used for micro-transactions with a significantly lower average transaction value, whereas credit cards are used for more expensive purchases.

Two major regulatory events are important for the digital payments industry in Indonesia, the first of which was the issuance in 2009 of the first regulation that defined ‘electronic money’. Then, in 2017, a broader regulatory package specifically targeting the growing fintech sector, which as the graphs above show coincided with a drastic change in the use of e-money. In the section below, I will present these regulatory changes and associated policies which were formative to the type of digital economy associated with the use of e-money today.

In 2009, the central bank, BI issued new regulation concerning what they called *uang elektronik*: electronic money (BI, 2009). The preamble of the regulation describes recent developments of information and communication technology and acknowledges that there is now a new type of digital money that is distinct from that ‘previously regulated as a prepayment card’. This electronic money takes other forms than plastic cards and can be issued by both bank and non-bank actors alike. This is an important formulation and deserves specific attention, as it is generally the domain of the state, via the Central Bank, to issue currency. This type of money can be likened to gift cards issued by commercial actors; a type of money that is purchased and earmarked for use in a specific store (Zelizer, 1995). According to this regulation, both commercial banks and non-bank actors, meaning for instance the actors from the fintech industry, can issue

forms of digital money. The regulation defines e-money as a *means of payment* with the following characteristics:

1. E-money is issued based on the equivalent value of money deposited by a Holder to the Issuer.
2. E-money is stored electronically in a media, such as a server or a chip.
3. E-money is used as a means of payment to a Merchant, who is not an Issuer of e-money.
4. E-money that has been deposited is not considered a form of savings as defined in the law concerning banking.

The 'Issuer' is the bank or non-bank actor. The 'Holder' is the customer. And the 'Merchant' is any affiliated actor willing to receive the e-money as a payment. According to this regulation, Issuers must apply for an e-money operating licence once the value of the money they hold in exchange for their issued e-money exceeds a certain amount, or if they from the beginning aim to exceed a certain threshold. This surplus money is what the industry calls *float funds*. In practice, the customer pays cash to the company in exchange for digital credit in the form of e-money. The cash money is stored in the bank account of the company. With thousands, if not millions of customers, the company thus presides over large sums of money. However, the regulation demands that Holders of e-money must be able to withdraw their e-money balance in the form of Indonesian rupiah at any given time. Thus, the float is carefully regulated, and e-money Issuers are obliged to keep the float in the form of safe and liquid assets. The software products, or apps, that these issuers develop I refer to here as 'digital wallets': accounts where a customer can 'hold' or store their digital credit and an interface through which they can access it to make payments to merchants, or to transfer money to other accounts.

One of the first forms of e-money to gain wide popularity in Indonesia was called BBM Money. Licensed through the commercial Bank Permata, BBM Money gave BlackBerry Messenger (BBM) users the option to install an app and connect to an existing BBM account which, like pulsa, could be 'topped up' with a credit balance, allowing users to make transfers between BBM contacts and the bank (Boellstorff, 2013). In 2013 "BlackBerry pioneered a "BBM Money" feature in Indonesia, which allows peer-to-peer cash transfers using BBM" (Boellstorff, 2013, p. 21). The dominance of BlackBerry mobile devices intersected with online trade happening across social media platforms in Indonesia, which led BBM Money to become a prominent tool for e-commerce. This was an early indicator of the entanglements between the communication industry, social media, and digital money. Despite its early dominance, by the start of my fieldwork in 2018, not a single interlocutor was using a BlackBerry phone. Instead, people have largely switched to android smartphones as cheaper Chinese brands such as Oppo, Vivo and Xiaomi have made smartphone ownership more accessible.

According to the BI website, 9 e-money licenses were issued already in 2009 (BI, 2021a). By the end of 2016, this number had increased to 21 and according to my interviews with company representatives, industry actors were now requesting that the government provide clearer guidelines for operation and regulation better suited to this new technology. Such intervention in the sector would ideally help provide more safety for consumers and a more stable and desirable environment for investors, whilst also giving more freedom to the technology companies. A perhaps more cynical interlocutor from the industry suggested that the willingness of the companies to encourage regulation was also an attempt to ‘close the door behind them’, making it more difficult for new actors to enter the industry as they would face new, expensive, legal hurdles.

The result was the release of an initial package of legislation pertaining to the digital payments market in late 2017 by BI and the OJK, which had been established in 2011. The regulatory package contained guidance on the implementation of ‘financial technology’ (BI, 2017a) namely the ‘fintech’ sector, as well as stricter regulation for the registration, management and monitoring of fintech operators (BI, 2017b). The package also introduced a ‘regulatory sandbox’ which gave more flexible conditions to fintech actors to experiment with their products under the supervision of regulatory authorities (BI, 2017c). Importantly, and perhaps as a response to both increasing anxieties about cryptocurrencies and the private credit that these e-money Issuers were issuing, one piece of regulation specifically defines the rupiah as the only legal tender for exchange in Indonesia (BI, 2017d).

I want to briefly address this last issue specifically. Globally, 2017 was the year that cryptocurrencies and their underlying blockchain technology reached broader public awareness, due to massive price surges of cryptocurrency tokens. In Indonesia, this led to a lot of public concern and media demonisation of cryptocurrencies. This concern emphasised the use of cryptocurrencies in relation to illicit activities, such as the consumption of drugs, which is a capital offence in Indonesia (cf. Nangoy, 2017; The Jakarta Post, 2018b). Meanwhile, there was a lot of hype about the technology as a possible ‘solution’ to the ‘problem’ of access to financial services for the large portion of the population without access to a bank account (cf. Lam, 2017). In late 2017, many nation-states were engaged in a discussion about how to regulate cryptocurrencies, and in Indonesia, many feared that their use would be banned. In practice, by declaring the Indonesian rupiah the only legal tender cryptocurrencies were de facto made illegal in the context of payments. Meanwhile, though cryptocurrencies were not considered legal tender, the Indonesian Futures Exchange Supervisory Board (BAPPEBTI – *Badan Pengawas Perdagangan Berjangka Komoditi*) decided that cryptocurrencies would be regulated as a commodity, making

it legal to trade cryptocurrencies as an asset on futures exchanges (Chang, 2019).

When I first began my fieldwork in Yogyakarta in early 2018, the use of digital wallet apps was limited to specific exchanges and contexts and remained far from the smooth transactional user experience one might have expected. Already the following year, the situation had changed significantly as digital wallets were rapidly becoming mainstream. One of the big changes was the introduction of QR codes as a means of facilitating payment, a solution that had been undergoing trials already since 2017, and which I had thus far only encountered in select malls. In 2019 Bank Indonesia launched an 'Indonesia Payment System 2025 Vision', abbreviated as IPS 2025, which introduced five key initiatives for the sector to be implemented by the central bank in coordination with government ministries as well as those from the industry itself. These include ensuring the integration between the digital economy with existing BI policies and mandates, a digital transformation of the banking industry, interconnectivity between banking and fintech, an emphasis on a more balanced approach to innovation, consumer protection and 'fair' competition, and finally emphasis on protecting national interests for 'cross-border use of digital economy and finance' (BI, 2021b, 2019). At the same time, they also launched the new Indonesian Standard for QR Codes (QRIS) in the hopes of ensuring more interoperability across digital platforms. It was the early trialling and regulatory sandbox-testing of these QR codes that had changed the payment landscape between my two rounds of fieldwork. Now, QR codes were everywhere, even outside the mall environment: stickered onto food carts and taped onto minimarket counters.



Figure 8: QR codes in a food stall, local Indomaret corner store, airport, and UGM canteen

Reviewing these regulatory changes, whilst they aimed to provide a safer and more stable environment, they were also intended to provide a supportive climate for the many new Indonesian fintech start-ups. One industry representative described during an interview in 2019, that in place of hard regulation, specifically in the case of data protection, the companies operated under 'strict' 'verbal rules' and were audited by BI who provided their 'blessings'. He suggested that BI was worried about implementing rules that would be too strict or rigid as it might restrict

the development of the burgeoning digital payments sector, which is widely perceived as being important to the Indonesian economy.

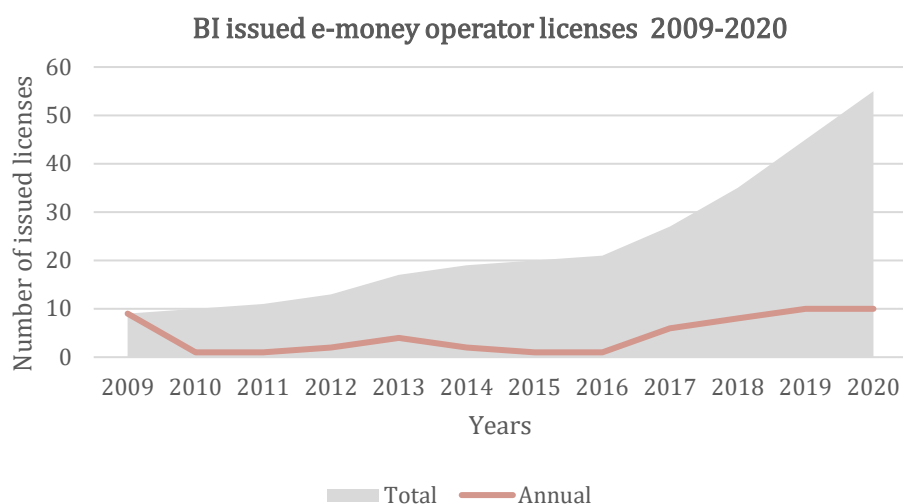


Figure 9: Annual and total BI issued e-money operator licenses between 2009 and 2020. (Source: BI, 2021)

While some e-money operators lost their licenses following the 2017 regulatory package, the total number of issued licenses has more than doubled between 2017 and 2020, as can be seen in Figure 9.¹⁷ By the end of 2020, 55 licenses had been issued to a variety of bank and non-bank operators. The e-money industry is in rapid development. In this section, I have described some key legislative changes that contributed to defining and developing the digital payment industry popularised in Indonesia today. However, there are also broader political tendencies that have an impact on this transition towards increasing the use of digital payments, which is what I turn to next.

Indonesia 4.0: Towards a Cashless Future

'Making Indonesia 4.0' is the name of a government roadmap for the years 2018-2030. Issued by the Ministry of Industry it sets out how to transition the Indonesian economy towards one based on what is called the 4th industrial revolution, or Industry 4.0 as it has come to be known (Kementerian Perindustrian, 2018). The term Industry 4.0 broadly identifies a shift within production and manufacturing towards a more digitally automated and 'intelligent' technology, as well as increasing digitalisation of products and services in the private sphere (Fuchs, 2018).

¹⁷ The full list can be found in appendix 2.

Underlying this industrial development is thus also an expectation of a broader social transformation towards a more networked society through smart cities, Internet of Things (IoT) devices, and increasing human interactions with robotics (Oztemel and Gursev, 2020). While the concept first emerged as a national economic strategy in Germany in 2011, it has gained traction across the world, with countries including Indonesia developing roadmaps and approaches for how best to manage a transition towards this version of the future.

President Jokowi announced the 'Making Indonesia 4.0' roadmap at the opening of the 2018 Indonesian Industrial Summit in April 2018. Widodo described his positive outlook for the 4th industrial revolution and his expectation that it would bring new jobs to Indonesia if the transition were managed properly. In his speech, he placed specific emphasis on the role of computing platforms, the mobile internet and smartphones, and the 'phenomenon' of 'big data' (Widodo, 2018). Explaining the name of the roadmap, the President said the following:

“In my opinion, the name of this program is very appropriate for two reasons, 'making' it can be interpreted as create, build, or realize something, where in this case it means rebuilding our industry. Second, the combination of 'making' with Indonesia means realizing, building Indonesia into a new era, namely Indonesia 4.0. It contains several big aspirations to revitalize Indonesia's industry as a whole.” (Widodo, 2018 translated from Bahasa Indonesia)

Widodo's statement reflects a duality, in which the strategy is both about developing Indonesia's industry in accordance with the ideas of 'industry 4.0', but also a remaking of the country itself into a new version, *Indonesia 4.0*. I will not be attempting a deeper analysis of the strategy but wish to briefly outline its main initiatives as I feel it provides an insight into how initiatives for digitalisation are bound up with the vision of a modern Indonesia.

The roadmap focuses on 5 manufacturing industries considered central to the Indonesian economy and seeks to develop these through various cross-cutting initiatives,¹⁸ many of which are grounded in digital innovation (Ministry of Industry, 2018). For instance, a series of strategic steps show how the labour force will be upskilled to make better use of networked technologies. There are also plans to increase industry use of 'big data', 3D printing, AI, and the IoT. It places a strategic emphasis on encouraging technological innovation by supporting the development of start-ups and business incubators, and a further emphasis on developing more technology-based entrepreneurship in Indonesia (Satya, 2018). When asking his opponent, Prabowo Subianto, in

¹⁸ The 5 industries are: food and beverages, textiles, automotive, electronics and chemicals.

the presidential debate how he will ensure the development of Indonesian unicorns, Widodo was also asking how to ensure that this vision of Indonesia comes to fruition. Subianto's answer challenges whether this is the priority of the majority of the population. Indeed, there may be many people who do not see themselves in the continuing public discourse of 'e-this and e-that' taking place among what some perceive to be the elites and the wealthier social classes.

Indonesia has not been known internationally as a big innovator or developer of technological hardware or digital software. Indonesia has however been known as a provider of secondary services to the internet economy, for example in the form of 'click-farms' (Lindquist, 2019). With these new investments and the expansion of Indonesian tech start-ups like Gojek in the international arena, the vision of a digital Indonesia has gained more prominence. For instance, former developers behind Indonesia's mega-apps are now hosting hackathons, boot camps and coding academies to both develop and recruit new talent (Hasibuan, 2018). During my time in Jogja, I met many aspiring tech entrepreneurs and even became a member of a tech hub called Jogja Digital Valley (JDV). It was sponsored by the telco Telkomsel and required me to use my thumbprint for access to a desk in the common office space. Through the JDV WhatsApp group, I would regularly get invitations to attend local tech events which were often hosted by local start-ups and sometimes more established industry actors. I caught many rides with online drivers who were learning to code from internet classes, hoping to get into the industry and eventually earn the type of money they imagined was possible in the start-up industry.

The Indonesia 4.0 strategy presents a vision for Indonesia as being one of the top-10 global economies by 2030. The strategy supports this development among other things by promising to allocate funding for research and activities related to technological development and innovation. In practice, this has increased funding for higher education, as part of the strategy to upskill the labour force. Yet it is worth noting that much of this is allocated towards tertiary education rather than investing in primary and secondary education which would more broadly benefit lower-income families (Kim, 2020). I will return to the state of the Indonesian economy in the next chapter, but for now, I want to turn briefly to the visions of an economy that is not just based on digital technology, but one that is also cashless.

In 2014, BI launched the 'National Non-Cash Movement' (GNNT – *Gerakan Nasional Non-Tunai*). The memorandum of understanding was co-signed by the Coordinating Ministry of Economic Affairs, the Ministry of Finance, and provincial governments. The signing took place in a Jakarta mall, a symbolic choice as stipulated in the subsequent press release, "representing a hub of financial transactions" (BI, 2014). The main purpose of the movement is to raise awareness and to familiarise the public with the use of non-cash-based payment instruments by demonstrating

its advantages over cash. However, included in this is also a goal of accelerating this digital transition towards a 'less-cash society' (Zuhra, 2016). The bank also emphasises the benefits of cashless payments, describing them as being more efficient and more 'transparent', as monitoring digital transactions is easier than cash transactions. Indonesia is known to have major issues with corruption and the GNNT is promoted as being anti-fraud and anti-graft. However, it undeniably also gives more control and surveillance of monetary flows to the banking sector, as well as providing extensive financial data which can be considered a valuable asset.

The movement hopes to achieve this through projects and policies at both national and local levels of governance alongside public workshops, seminars, and media campaigns. For example, there was an enforcement of digital payments for using the toll road infrastructure in 2017 using prepaid and refillable e-toll cards (Rochmawati, 2018). Regarding this, the BI head of Payment System Policy was quoted as saying, "After we force the non-cash, it increased significantly – our latest records showed a 400-percent jump" (Amelia, 2018). Yet no mention of the consequences for those people who did not have access to such a card, and as a result are now cut-off from one of the core infrastructural transport arteries of the country. BI also expressed support for a draft law that would see the government impose limitations on cash transactions. Ostensibly this was to curb corruption by forcing transactions over Rp 100,000,000 to be made digitally, and thus making transactions theoretically more traceable (Nurita and Aji, 2018; Reuters, 2018). But the movement is also represented through 'softer' initiatives like the 'Cashless Movement Week' held in West Papua in 2017. This began with an announcement event held at a mall with the tagline "With Cashless Movement: Easier, Safer, Cooler!" (BI, 2017e). Notably, BI is also actively monitoring the use of cash money in the border areas of Papua, a part of the country that has long been engaged in an independence movement and that continues to face violent oppression by the state alongside extensive resource extraction and dispossession by corporations (cf. Tilley, 2016). Another example is the establishment of the 'Digital Village Pilot Project' in which disbursement of government funding and subsequent local transactions would be digitised in 5 districts (BI, 2016). According to Bank Indonesia, "This initiative is part of the national non-cash movement and inclusive finance programme through digital financial services" (Katadata.co.id, 2016).

The GNNT has been criticised for a variety of reasons. For example, there are concerns about infrastructural readiness, which might cause some people to be unintentionally excluded simply due to being unable to 'top-up' or because the system fails. Similarly, there are concerns that the costs to top-up such pre-paid cards could become barriers to access, particularly for those that are already disadvantaged. Despite its many years of existence, the GNNT also does not feature prominently in my fieldwork. Except for government representatives that I spoke with, no one

ever mentioned it, and some research indicates that the public awareness of the campaign itself is limited (cf. Safitri and Nainggolan, 2017). That being said, many interlocutors that were already using digital payments expressed that they felt increased use was limited by 'lack of information', or because it had not yet been '*disosialisasikan*': people had not been familiarized with it through public awareness initiatives. Meanwhile, Indonesia has been characterised by a lack of trust in digital payments, and statistically, Indonesia is among the countries with the highest ranking of e-commerce crime (Azali, 2016, p. 373). Throughout my fieldwork, many people would tell me stories of people they knew who had experienced losing millions of rupiah after being tricked or even 'hypnotised'. One interlocutor described how a friend had lost 5 million rupiah while she was on the phone with who she thought was a customer to her online shop:

[...] it was fraud. Voice phishing, or was it... hypnosis? Hypnosis via phone call.
[...] She knew it once when she was no longer on the phone. She realized when it was cut off. [Imitating friend] "I don't have any money anymore. I don't have any ATM anymore."

[Interlocutor 2]

One of the arguments that the GNNT often makes to advocate for the 'less cash society' is the importance of digitalisation as a tool for financial inclusion. The concept of 'financial inclusion' is itself diffuse, and I will provide a more in-depth exploration of it in the next chapter. For the moment, I want to focus on the 'National Financial Inclusion Strategy' (SNKI – *Strategi Nasional Keuangan Inklusif*) which was established in 2016 by President Jokowi (Presiden Republik Indonesia, 2016). According to the Ministry of Finance, the new strategy had the goal to ensure that 75 per cent of the Indonesian population had access to a bank account by 2019 as a means of alleviating poverty (Ministry of Finance, 2016). Financial inclusion here first and foremost means ensuring access to so-called 'formal financial services' for the so-called 'unbanked'. Formal financial services begin with a bank account with a formal financial institution, but extends to having the opportunity for savings, access to credit and making investments, as well as insurance (SNKI, 2017). Statistics for financial inclusion in Indonesia vary, but generally, all show that the percentage of the population registered with a formal bank account is less than half. Access to financial infrastructures has generally been prioritised for formal companies and individuals with high income. According to the World Bank Global Financial Index, 19.6 per cent of the adult Indonesian population had a bank account in 2011, increasing to 36.1 in 2014. By 2018, that number had increased to 48.9, almost half the population (World Bank, 2018). In her review of e-money developments in Indonesia, Azali points out that both the Indonesian E-Commerce Association and private actors such as MasterCard offer more conservative estimates suggesting that only around 20 per cent of adults had a registered bank account in 2014 (Azali, 2016, p. 366).

In their report on ‘improving financial access’ from 2010, the World Bank writes that a major change in terms of access to financial services in Indonesia came following the 1997/98 financial crisis in Southeast Asia and following the ousting of Suharto. In part, the increase in registered accounts may have been related to the increased number of bank branches, but another important development of the financial infrastructure was the major growth of the ATM network. Between 2000 and 2008, the number of ATMs nearly tripled (World Bank, 2010, p. 22) and between 2004 and 2017, the number of ATMs per 100,000 adults in Indonesia continued to grow from 8.6 to 55.1 (WB, 2020). However, both bank branches and ATMs are heavily concentrated in the capital Jakarta which is considered ‘over-serviced’ (Azali, 2016; World Bank, 2010). Much like with internet access, the more rural areas which present geographical challenges for infrastructural development have less access to formal financial services.

Returning to the SNKI, the strategy included a variety of initiatives to reach the goal of a 75 per cent ‘banked’ population. These were formulated as 6 pillars: financial education, public financial facilities, mapping of financial information, supporting policies and regulation, introducing intermediary facilities and distribution channels, such as OJK, for financial services and social assistance programs, and finally improved consumer protections (Gunarsih et al., 2018). The strategy is an ambitious project involving collaboration from multiple government agencies also overlapping with the ideals of the GNNT. For instance, the President emphasised that the strategy would help channel social assistance to the population more efficiently. Rather than disbursing cash, the poor would now have bank accounts, so that money could be distributed digitally. At the SNKI announcement event, he was quoted as stating, “I have instructed all ministers not to distribute the assistance funds in cash. They must be channelled through our banking system” (Parlina, 2016). In addition, a large element of this push for increased bank account registration was the ‘branchless banking’ initiative, through which registered agents can function as a decentralised bank branch in places where there are no ‘brick and mortar’ bank branches. These agent-based, branchless banks rely on digital technologies and the internet to provide customers with a place to both store their savings and make withdrawals, as well as receive their government-issued assistance (Rachmawati et al., 2019). By November 2019, OJK issued a press release with the findings of a recent survey they had conducted, which indicated that the SNKI goal had been reached, even exceeded very slightly, with an index rating of 76.19 per cent of the population with a registered bank account (OJK, 2019).

Together these policies convey a correlation between how digitalisation is viewed as a tool for economic progress in which cashless payments are considered a mechanism that can lead to more financial inclusion. However, the number of people registered with a bank account does not

equate to the number of people experiencing access to financial services in practice, as my interview with the women in the P2P lending group showed. Meanwhile, initiatives that force digitisation in such a way that it is impossible to opt-out, risk excluding people who are already marginalised. For people who do not have access to a digital balance, eliminating cash payments to access a road results in exclusion rather than financial inclusion. Though the women from the P2P lending group in my interview were all technically 'banked', they had very different experiences of what that meant in practice. The emphasis being less on the ability to make payments digitally, and more on being able to manoeuvre money into whatever form suited their financial needs. They made use of a variety of tools, from the P2P lending group to the ATM, to the TrueMoney agents, to their neighbours. What counts as having 'access to financial services' is not a binary category, and it is important to acknowledge that 'access' can be a shifting condition which people themselves have agency to affect (Burrell, 2016; Taylor and Horst, 2018). As evidenced by the emphasis on the role of the ATM as a site for materialising digital value, providing a viable technological alternative to these conventional financial services means supporting people's ability to transition flexibly between forms of digital and tangible money.

2.3 Indonesian Unicorns and their Driver-Partners

As mentioned in the introduction, there are 6 tech unicorns in Indonesia: Gojek, OVO, Traveloka, Tokopedia, Bukalapak, and JD Indonesia. The last three are all e-commerce platforms, whereas Traveloka is a ticket booking platform for various forms of travel. Of the 50 licensed operators in operation in 2020, GoPay, the integrated digital wallet of Gojek, and the digital wallet app OVO heavily dominate the e-money market. They represent two different infrastructural models, and both have access to a fleet of exchange agents in the form of so-called 'driver-partners' who can facilitate the conversion of Indonesian rupiah to e-money through the app infrastructure.

Both GoPay and OVO share key defining traits: they are smartphone apps that allow customers to exchange their Indonesian rupiah for a digital credit balance issued by the company called a *saldo*. This balance can then be used to make in-app payments to associated merchants. In the following section, I will describe first the relationship between the 'ride-hailing' company Gojek and its wallet GoPay, followed by the wallet OVO and its relationship to Gojek's main competitor, Grab. I will describe how the apps emerged and how they developed during my research. As GoPay and OVO are now the largest e-money platforms in Indonesia, it is of particular interest to convey how the story of their expansion was intimately connected to the way they mobilized 'online' drivers as exchange agents for digital money. This aspect sets them apart from competing brands and makes for an interesting case for the specific entanglements between online drivers and digital

payments. I show how both apps have transitioned from relatively simple transport and ride-hailing services to a much more expansive ecosystem of services where digital payments are at their core. Finally, I examine how investments and more recent developments within these companies demonstrate a business model aimed towards not just providing a payments service, but increasingly broader financial services with the goal of bringing these services to those considered to be ‘unbanked’.

Gojek and GoPay

GoPay is the integrated wallet mechanism within the Gojek app. An early mover, the company received e-money license number 19 (No. 16/98/DKSP) in September 2014. This was prior to the release of the Gojek app itself in 2015, showing the foresight of including an integrated payment in the transport app. The company behind Gojek is called PT Anak Bangsa,¹⁹ and though the wallet is integrated within the Gojek app, the license is held by a company called PT Dompot Anak Bangsa, *dompot* being the Indonesian word for wallet. To explain how GoPay works it is necessary to provide some context for the Gojek app.

Gojek was founded in 2010 by Nadiem Makarim, as a way to formalise the existing transit services of ojek, informal motorcycle drivers who would take you as a passenger at a negotiable price (Ford and Honan, 2017). Hence the origin of the name: Go-Jek. Makarim had just returned to the capital of Jakarta after completing studies at Harvard University to begin working as a management consultant for the international firm, McKinsey & Company. The legend around this origin story states that Makarim found himself a regular user of ojeks and found the premise of drivers waiting around for passengers, and passengers walking around looking for drivers highly inefficient. So, he developed a service that would allow service providers and service users to connect more effectively. He would almost certainly have experienced this similar concept through US-based ride-hailing apps such as Uber during his time at Harvard. In an interview with the online portal, tech360.tv, he explained, “I created Go-Jek on the basis that I was quite frustrated because I am lazy. I don’t want to wait in traffic. I need things fast and super practical. Everyone needs food, transportation, and a way to pay. It connects everything through a single app, one app to rule them all” (tech360.tv, 2016). In interviews and public speaking events, he frequently speaks about the need for hyper innovation and ‘business jujitsu’ and explains that Gojek constitutes a challenging adversary for established international competitors like Uber and Grab.

It is worth dwelling momentarily on this mythos of Nadiem Makarim and what it means for both

¹⁹ PT stands for *Perseroan Terbatas* which is the Indonesian term for a limited liability company.

the company and the people who use Gojek. In another interview conducted with LINE Indonesia in 2016, the interviewer asks why Makarim chose to return to Indonesia after having completed his education abroad. Makarim responds that he feels that Indonesia has a lot of opportunities for entrepreneurship, as well as many problems to be solved. Makarim is dressed casually, he talks about being an ordinary person without a personal car and driver in a city plagued by traffic jams. He speaks about his inability to code despite being CEO of a tech company, switching fluidly between Bahasa Indonesia and English phrases for certain emphasis. For example, as he explains in Indonesian that when starting Gojek, he was motivated by a sense that ojek drivers could be more productive, switching to English, *throughout the day*. Continuing in Indonesian, he does not believe that they should be limited to only driving, that they could also operate as couriers and offer delivery services to increase their income if only they, in English, *try harder* (LINE Indonesia, 2016). According to Makarim, ojek drivers had a bad public reputation. They were informal labourers associated with criminality, they were unhygienic, often hanging out by the side of the road, and provided an unreliable service. In his view, providing the booking platform would solve what he considered to be a 'trust issue'. By formalising their service, Makarim felt he had also given them the social recognition that he felt they actually deserved (Wirjawan, 2020).

At its launch in 2011, Gojek was an ordering service with a small, fixed fleet of drivers which customers could call to book. By 2015, the company relaunched its service as an app and saw rapid development. Within a year the Gojek app had been installed 10 million times and the fleet of drivers had grown to 200,000 (Ford and Honan, 2017, p. 277). Gojek as a result started expanding its services from 'online ojek' into GoCar, GoFood, and even GoMassage. The wallet, GoPay, licensed before the launch of the app, came to serve as an embedded payment mechanism across the various services available within the app ecosystem. Looking back at what Makarim described regarding the creation of Gojek, you notice that he emphasises the process of formalisation of an existing service. A process that would benefit the drivers by increasing both their income and public estimation, but also a process that emphasises values of efficiency, productivity, cost reduction, and high levels of performance. All of which are values heavily associated with the curricula and culture of management consulting and the finance industry (cf. Chong, 2018). Makarim may indeed be helping drivers, but he is first and foremost building the type of infrastructure that he and the young professionals of Jakarta like him needed: a more reliable version of the cheap transport service that could be summoned at the time of your own choosing.

During a 2019 fireside chat at an industry event, Makarim makes an interesting observation about the app he helped create, calling Gojek the 'operating system of the real world'. Makarim elaborates: "You're creating a cyborg, in our consumers, that are able to not have to do the things

that they don't wanna do, and therefore [have] more time to get stuff done in life." (Wirjawan, 2020). Implicit here is the logic of automation which reduces the time spent on a process. Through this 'automation', the app, the phone, and the driver who is tasked with doing those things for you all become a part of your extended cyborg self. It is interesting that the emphasis here is on how the app can serve those similar to Makarim himself. His emphasis on productivity, efficiency, on not having to waste your own time when someone can waste theirs for you, feels remarkably revealing of his worldview and his orientation as one of the app's consumer-cyborgs.

Makarim has never been a driver himself, but his legend extends beyond the entrepreneurial class and Gojek's investors. In October 2019, newly re-elected President Jokowi announced his new cabinet, in which several young business executives received ministerial appointments. After extensive speculation and a brief rumour that Makarim would be announced as Minister of Digital Economy, Makarim became appointed as the new Minister of Education and Culture. The media was quick to laud Makarim's 'willingness to take risks' and to suggest that his skills from the start-up industry would enable him to 'innovate' in both education and culture (Istanto, 2019; Lee and Singgih, 2019).

While Jokowi speaks proudly of Indonesia's ability to produce several unicorns within the tech sector, it is important to note that they are heavily financed by international corporations. Only a year after the initial launch of the app, Gojek closed a massive investment round which included Chinese-based conglomerate holding company Tencent, and United States (US) based Alphabet Group, more commonly known as Google. This led to Gojek becoming the first Indonesian tech company valued at over one billion USD: the first Indonesian 'unicorn'. Gojek has since been through more funding rounds and has also acquired support from US-based companies Facebook and PayPal (Potkin, 2020; Singh, 2020). Whilst Gojek originated as a way to bridge the gap between drivers and passengers, the prominence of its digital payment infrastructure has grown dramatically and it is now one of the most commonly used digital payment options in Indonesia (Hijanto, 2020). In a Bloomberg interview about GoPay in 2017, Makarim described how ambiguity regarding Gojek's core services was an advantage the company had over its competitors:

"[...] we have so many different verticals that interrelate with each other, it's very hard to deal with this animal called Gojek. You think you're competing with us on ride-hailing, but actually you're competing with us on the user that uses food and ride-hailing. And you think you're competing on food, and then you realise that wait a minute, this is a digital wallet player that is leveraging that in order to further reinforce its food and transport business." (Bloomberg Markets and Finance, 2017)

The interview takes place shortly after the regulatory changes for e-money licences, and Makarim informs the interviewer that Gojek is the only 'pure tech' company that currently has an e-money license in Indonesia, referring to its bank and telco competitors. Makarim ends by predicting that 2018 will be the year that GoPay expands outside the app ecosystem itself. Though the above quote is intended as an example of their business manoeuvrings, it is also a revealing moment regarding the integral entanglements of digital payments and online drivers, and the way Gojek has been able to leverage its strong position as a ride-hailing app to promote its growing financial services, and the super app vision of 'one app to rule them all' to its existing customers.

Though there is a clear mutual dependence between the app as a platform for transport services, and its capacity as a digital wallet, there are notable tensions. The GoPay wallet does not currently exist as a stand-alone app, instead, the entire character of the Gojek app itself seems to have shifted. This is demonstrated in the 2019 redesign of both the app interface and the Gojek logo itself. Previously, the Gojek logo depicted an ojek driver with the 'online' element represented as the familiar Wi-Fi icon over the helmet. The new logo is called 'Solv', imitating the techy vowel-deficient language of Silicon Valley but also hinting at the app's new purpose as being a go-to for any problem that needed solving (Hakim, 2019). The new logo and interface were criticised by some on social media as losing its 'Indonesianess' in favour of a more streamlined tech start-up look. This redesign also marked a change in the core services of the app from ride-hailing to becoming a multi-service platform with an integrated payment system. At the same time, the company also changed its name from being Go-Jek to simply Gojek.



Figure 10: Gojek's former logo and the new logo 'Solv'

OVO and Grab

OVO is an Indonesian stand-alone wallet app that received e-money licence number 26 (No. 19/661/DKSP/Srt/B) in August 2017. Besides having a standalone app, the company behind OVO also partners with other e-commerce platforms that do not have an e-money license to provide an integrated payment option. Like Gojek, OVO is one of just a handful of Indonesian 'unicorns' following extensive international investments.

The OVO license was issued to a company called PT Visionet Internasional which at the time was owned by a multinational conglomerate called The Lippo Group who originated from Indonesia.

The app was originally intended to target customers of the many malls, cinemas, and other franchises that the Lippo Group oversaw by providing loyalty points and specific financial services (Ping, 2019). Though OVO does not have the same iconic origin story as Gojek, the Lippo Group has its own established history and associations in Indonesia. Founded by now-billionaire Mochtar Riady, the Lippo Group company is a family run business. The appointment of his grandson John Riady to senior leadership is seen by some as an attempt to bring a new direction to the company. Notably, he has been a prominent part of the push for the group to focus more on digitalisation and especially their digital wallet, OVO (Kleiner, 2020).

Having secured the e-money license in 2017 OVO was able to partner with companies to provide them with an integrated payment option. This is similar to what is known in the industry as a 'white-label' wallet where the companies use the services of another company rebranded as their own. OVO retains their strong brand integrity throughout their collaborations continuing to use both its logo and its distinct purple colour across partnering platforms. Pertinent to this research is the partnership that OVO established with Gojek's main competitor, the Singaporean ride-hailing company Grab which also contributed with financial investments into the digital wallet (Tani, 2018). Across Southeast Asia, Grab operates GrabPay as the integrated payment mechanism for its transport and delivery services but lost its license in Indonesia following the 2017 regulatory change. For a brief period, Uber was also competing with both Gojek and Grab, though it was struggling to gain traction. In early 2018, Grab bought out the last of Uber's presence in Indonesia, offering a fast-track program for former Uber drivers to join the Grab fleet, consolidating their position as a competitive transport app locally (Maulia, 2018). For OVO, partnering with Grab gave them instant access to a large fleet of exchange agents who could promote their digital credit, as well as a new customer base who were not necessarily motivated by accumulating points at the mall. It is worth noting how the current CEO of OVO, Jason Thomsen describes his path when asked by a journalist what motivated him to move to Indonesia to work for OVO.

"And then out of the blue, I got a call from Grab talking about how they wanted to develop payments and financial services. What really got me hooked was the way Anthony Tan, CEO of Grab, talked about the drivers. He talked about Indonesia and Jakarta and its infrastructure, the work we got to do, the way we need to bring investments to Southeast Asia, the way we need to give people confidence to invest in Southeast Asia." (Thomsen as cited in Ping, 2019)

Though it operates as a separate company, providing its services to other e-commerce platforms that do not have their own license, as with GoPay, the expansion of the OVO digital wallet is inextricably connected to a ride-hailing app and its fleet of drivers. In the interview, Thomsen

explains how OVO became a leading digital wallet in Indonesia specifically due to the ‘taxi-booking’ system, and the company now sees itself as moving beyond payments towards offering financial services. This connection was further emphasised in late 2019 when Mochtar Riady made the public announcement that the Lippo Group had sold the majority of its shares of PT Visionet Internasional to the Japanese SoftBank Group (Akhaya, 2019a). The SoftBank Group is an international conglomerate known to invest heavily in technology and finance-oriented companies and is also a major investor in both Grab and Uber (Choudhury, 2019; Levy, 2019).

From Ride-Hailing to Servicing “The Unbanked”

While they have different points of origin, both GoPay and OVO are digital wallets that are intimately connected with the lives and experiences of the online drivers that helped the businesses to grow. Having established broad usership and extensive investments, both companies are now making moves to expand the side of their businesses that focus on digital payments and a broader range of financial services.

In 2017, Gojek famously made a series of investments to acquire several local start-ups, namely Kartuku, Midtrans, and Mapan (Judith, 2017). At the time, Kartuku was a leading offline payments processor, while Midtrans was an online payment gateway, and both these technologies and the company CEOs became integrated into Gojek and GoPay. The third start-up, Mapan, was an app that focused on supporting local community microfinance practices such as the rotating savings and credit associations known in Indonesia as *arisan*. Markedly, the former CEO’s of Mapan and Midtrans Aldi Haryoprato and Ryu Suliawan respectively were both previously friends of Nadiem Makarim who they met when all three were students at Harvard Business School (Makarim, 2019). While the first two companies were critical to establishing the technical capacity to process a high volume of digital transactions, the integration of Mapan and the positioning of its former CEO, Haryoprato as the new CEO of GoPay signalled an interest in creating access to those people who might otherwise be considered ‘underserved’ by conventional financial services. In a public statement shared on the company blog after the acquisitions, Makarim expressed his expectations for their future collaboration, “on a shared mission to stimulate economic growth and improve lives through increased financial inclusion in Indonesia. This is in line with the Indonesian government’s aspiration for the country to become the largest digital economy in Southeast Asia by 2020” (Gojek, 2017). In the same blog post, Haryoprato emphasises even further the focus on ‘financial inclusion’:

“By becoming part of the GO-JEK Group, we will accelerate financial inclusion for the unbanked, particularly in rural areas where many of GO-JEK’s existing services might not be widely available. [...] Through our community groups, we

will also be able to help our members develop more responsible financial habits, which gives them opportunities for a better life.” (Gojek, 2017)

This emphasis stems from the idea that the poor people they aim to support are perceived as being somehow financially irresponsible, and this is positioned as a reason for them having a low quality of life. The idea that digital payments can lead to ‘financial inclusion’ and that the digital economy could be a tool of empowerment for the poor, was also highlighted in a statement made by Matt Idema, the CEO of WhatsApp, following Facebook’s investment in Gojek:

“This investment will support Facebook and Gojek’s shared goal of empowering businesses and driving financial inclusion across the archipelago. WhatsApp helps small businesses communicate with customers and make sales, and together with Gojek, we believe we can bring millions of people into Indonesia’s growing digital economy.” (Idema, 2020)

Gojek has continued its acquisitions both locally and abroad such as spending 130 million USD to acquire the Indonesian start-up Moka. Moka is a Point-of-Sale (PoS) app that allows small businesses to receive payments via a phone or tablet from both plastic cards and digital wallets (Lee, 2020b). Gojek has also recently received a 150 million USD investment from Telkomsel, which stated the following in a press release:

“The collaboration marks an expansion of Gojek and Telkomsel’s multi-year partnership that has offered affordable data packages to Gojek driver-partners since 2018. It will open up a broad range of collaboration opportunities designed to capitalise on the combined scale of both businesses to reach millions of Indonesians throughout the archipelago.” (Telkomsel, 2020)

In the press release, they further stress how they will collaborate to provide better promotional offers for their customers, on growing the ‘digital lifestyle sector’, increase the ‘advertising technology’ for merchants, and establish better training opportunities to ‘boost Indonesia’s technology talent pool’ (Telkomsel, 2020). Gojek itself has also expanded its services into the neighbouring countries of Vietnam, Thailand and Singapore, whilst also investing in other ride-hailing apps across South and Southeast Asia (Russell, 2019a, 2018). Furthermore, Gojek has begun to acquire stakes in existing digital payment solutions in those countries, such as the Vietnamese payment startup WePay (Nguyen, 2020), and Coins.ph in the Philippines in advance of establishing operations there as well (Russell, 2019b). Coins.ph started as a cryptocurrency exchange service and continues to offer this service alongside more conventional digital financial services. In a public statement, Gojek commented that they hoped the collaboration between GoPay and Coins.ph would “encourage a cashless society and enhance access to financial services in the Philippines” (Russell, 2019b).

Similar to Gojek, OVO has continued to make investments and acquisitions into smaller Indonesian start-ups within the financial services sector such as Taralite, a P2P lending service (Akhaya, 2019b), and Bareksa, a mutual fund investment platform (The Jakarta Post, 2019c). Like Gojek, there seems to be an increasing shift towards the broader role of financial services in which tech actors leverage their existing networks and infrastructure to capitalise on their access to a group of people who have so far been excluded from the formal financial industry. Of the acquisitions, head of OVO public relations, Sinta Setyaningsih emphasised that the company hoped to support the Indonesian government with their goals for improving financial inclusion and was quoted as saying: "Almost 30 percent of OVO users are unbanked. They usually top-up their OVO credits through Grab drivers, not bank transactions. These people did not have a bank account, but they are comfortable using OVO" (Shofa and Djono, 2020). Her statement again draws attention to the critical connection of online drivers, digital payments and the argument that these financial services benefit people that have otherwise been perceived as being socio-economically marginalised. It also alludes to the role that drivers play in ensuring that customers feel comfortable with e-money, which I will discuss further later in this thesis. OVO continues to expand its financial services specifically hoping to attract those customers who are not already users of conventional financial services through digital 'cash' and the new 'PayLater' credit services enabled by their recent acquisitions (Ping, 2019).

Gojek has also begun to expand its services to include credit in the form of a 'PayLater' option for customers that upgrade their accounts to GoPay plus. Similar to a post-paid telecommunications package, rather than, for instance, the top-up model of consumption, users would have a debt limit and would also be charged a monthly 'subscription fee' for using the service (Nabila, 2018). According to Gojek, these micro-loans are interest-free, with users only paying the subscription fee in the periods where they have an active loan. GoPay and OVO have both spent a lot of money on subsidising their services for end-users, particularly by offering major promo's and so-called 'cashbacks' as they compete in vying for users on their respective platforms. It has been an expensive strategy, as was emphasised when the Lippo Group were forced to sell parts of the company. One of the important assets that these companies have is an extensive amount of consumer data: with over 5 billion e-money transactions in 2019 (BI, 2020a), giving them an unprecedented insight into consumer behaviours. These companies are extremely well-positioned to make assessments about the creditworthiness of individual consumers and to provide these new financial products. Products where users can pay to establish micro-loans which may ultimately prove to be a more financially lucrative business model for the companies (Tani, 2019). Furthermore, there have been continuing rumours about the possible merger of

Gojek and Grab, which would result in a company dominating the market of delivery services and digital wallets in almost all of Southeast Asia. Though the rumours have been persistent throughout my fieldwork and continue to emerge in headlines every few months, there has been no formal acknowledgement from either company and such a merger would likely violate local anti-trust laws. Nevertheless, in December 2020 drivers from both apps announced that they would launch a nationwide protest, believing that such a merger negotiated without any driver involvement would negatively impact driver conditions (Eloksari, 2020; Jefriando and Potkin, 2020).

As the digital economy continues to grow in Indonesia, this expansion is so often tied to a call for financial inclusion. In the examples above, the companies even refer explicitly to the goals of the government in terms of both creating a more digital society and one that has 'more' financial inclusion. They emphasise how their financial products will provide opportunities for those considered 'unbanked', allowing them to participate in the 'digital economy' and make the assertion that this 'inclusion' will benefit these poor people financially. Of course, it will also benefit these companies financially as this inclusion would also involve a large uptake of new customers. In the next chapter, I will explore the origins of this concept of financial inclusion and how it has come to be tied to financial technology.

2.4 Conclusion

In Indonesia, the form of money circulating within the payment apps is referred to as e-money. E-money distinguishes itself from other forms of digital money, such as that used with plastic cards or phone credits, in that it is money issued as a digital credit that can typically be accessed through a smartphone app. E-money can be issued by bank and non-bank actors alike, through which customers purchase the credits with cash. The point then is that this type of money allows users to convert money into a digital form, through which they can then make cashless payments. For users, it appears as a credit balance within the app interface, through which it can be used to make payments to those merchants that are associated with the respective platform.

This system is premised on a familiar mechanism in Indonesia, by which users can 'top-up' or refill accounts, electricity meters, or phone airtime credits by paying in advance for what they will use, and then refilling, as necessary. Distinguishing itself from other peer-to-peer (P2P) payment systems that enabled feature phone users to make digital transactions, these new digital wallets rely on users having access to a smartphone. Though the use of mobile phones far exceeds the members of the population with access to a bank account in Indonesia smartphones are less common. Smartphones are becoming more common, but it is important to keep in mind that this

is in part due to the emergence of cheaper smartphone brands from Chinese companies, which means that these models often have limited storage space for multiple apps. As the ecosystem of the digital economy continues to expand, some users may find that they must prioritise between not only payment apps, but also payment apps and for instance social media apps. In practice, access to the digital economy is not just divided between feature phone and smartphone users. Existing inequalities lead to the emergence of digital hierarchies in terms of who can access and take the most advantage of these new technologies. Having to choose between which platform to download, the companies are greatly incentivised to capture customers to their platforms first, with the hopes that they will remain as the systems continue to grow.

These inequalities of access have the potential to be exacerbated due to the requirement of internet access to use digital payment apps. Where use of the internet in Indonesia was spread in large part due to activist initiatives to increase access to information during a politically important time, most Indonesian internet users today access it with their phones, and typically in relation to using social media which is technically free to use in terms of data consumption. Doing so requires either purchasing data packages or accessing public Wi-Fi in hotspots such as at minimarkets, malls, or cafés and restaurants such as Starbucks. These are often spaces that are excluding to people of lower income or people who are perceived as being lower-class, once again leading to disparities of access and contributing to the further hierarchisation of internet access, and thus digital payment users, while also re-entrenching existing socio-economic inequalities. This hierarchisation is evidenced in part in media portrayals of who is considered members of the modern and digitally networked nation, through which feature phone users are portrayed as being a more backward, less modern type of citizen.

This entanglement with ideas about modernity and being digitally networked is also pervasive in recent political discourse, in which the digitalisation of industry is seen by some as a cornerstone of continuing economic growth. Increasing emphasis on cashless payments is seen as a critical component to the growth of Indonesian e-commerce, as well as a tool for financial inclusion. The argument being that this technology will allow the poor and socio-economically marginalised to gain access to the digital economy, and thus pull themselves out of poverty. In practice, some of these policies have led to increased exclusions. For instance, by making access to toll roads available only to those with digital money, you create a public space from which some members of the public are structurally excluded, relegated to spending time in the traffic jams that the toll roads were supposed to circumvent.

In a context where the vast majority of the population still rely on cash for day-to-day transaction, the ATM functions as critical financial infrastructure, enabling users to withdraw money, but also

to make digital payments directly from the machine interface, or make deposits. It is a fundamental enabler of the digital economy; in that it allows people to transition their money flexibly between digital and tangible forms. Despite its seeming immobility, the ATM was perceived by some as a more flexible infrastructure for digital payments than the apps on their portable smartphones. The ATMs were reliable, and the money stored there could be used for anything, unlike the money trapped within the respective transactional communities of the digital payment apps. It did not rely on having internet access to work. Particularly for those travelling between regions, where the infrastructural dynamics of the network providers means that data, they have paid for may not be available for use, having to rely on an app requiring the internet to access your money comes with certain risks. Once again, those who can afford better, and more reliable internet are better positioned to take advantage of these new technologies and are perhaps less reliant on the ability to re-materialise money that has been converted into digital form.

The two largest digital payment platforms in Indonesia, GoPay and OVO both gained prominence as being the integrated payment mechanism of a ride-hailing platform, Gojek and Grab respectively, both of which are modelled on similar Western apps such as Uber and Lyft. Thus, they had the unique advantage over other e-money issuers, that they had access to an extensive fleet of exchange agents through their driver-partners. The importance of drivers to the business model of these apps is emphasised repeatedly by the companies that speak about them and their work in almost noble terms. Through the drivers, customers can exchange their cash for digital credits, and in that way, access and pay for the services within the apps. Thus, these drivers, operating under conditions familiar to the gig economy, become an extension of the app itself, by providing a critical access point to the digital economy.

Meanwhile, both Gojek and Grab have been evolving from being a transport app with an integrated payment mechanism, to being increasingly focused not just on digital payments, but on providing broader financial services, such as P2P lending. So much so that the familiar image of a motorcycle driver was removed from the Gojek company logo. Where the ride-hailing app was intended to provide a seemingly neutral connection point for service users and service providers, the needs of the customer is becoming increasingly central to the vision of the app. Across his many public talks, Gojek founder Nadiem Makarim reveals a particular type of user envisioned by the app, one that is not unlike himself. He describes how the app enables people to avoid doing things 'they don't wanna do' because, through the app, they can order someone else to do it for them. He configures the customers as consumer-cyborgs. For the consumer-cyborg, the app and the bodies of the driver-partners are just an extension of self in service of meeting your needs, be they

transportation, food delivery, or digital money.

Despite the existing inequalities of access to digital payments as mediated through smartphones, these companies often leverage arguments about contributing to financial inclusion with their technology. Indeed, the argument is raised also by their international investors, such as Facebook. These technologies, they claim, can contribute to improving the livelihoods of people simply by providing an access point to the digital economy. Meanwhile, in the competition to bring more users into your specific ecosystem, targeting those considered outside of the formal financial system can also be a strategy for growing your customer base and ensuring the dominance of your particular platform. For companies such as Facebook, which are already a dominating part of the Indonesian internet experience through social media use, collaboration with these emerging financial services providers is also a strategy for connecting their services to digital payments. In the next chapter, I explore these arguments about financial inclusion and cashless payments, and the way driver-partners are mobilised in service of the digital economy through the app infrastructure.

3.1 Introduction

In contexts such as Indonesia, where people are more likely to have a mobile phone than a bank account, the concept of peer-to-peer (P2P) payment systems is often advanced as a mechanism for 'financial inclusion'. Familiar arguments suggest that this technology can lead to reduced poverty and improved livelihoods simply by providing an access point to the digital economy. I begin this chapter by examining the origins of the idea of 'financial inclusion' and its relation to the global poverty alleviation agenda and show how the idea is premised on poverty as an individual rather than a structural problem. I show also how this is related to a paradigm shift within the industry, which came to view the global poor as a new market for digital financial services.

The Indonesian movement towards a less-cash society is not unique. I proceed in this chapter by drawing attention to how the advocacy of financial inclusion and the use of digital payments is often aligned with arguments in favour of transitioning away from cash entirely. Arguments in favour of such a transition emphasise how cashless transactions can be cheaper, faster, and more secure than cash. A more critical perspective might suggest that the discourse of financial inclusion here is used to justify the advancement of privately operated payment platforms into the centre of our transactional practices. Thus, I draw attention to examples of what cash can be replaced by and how the experience of a cashless society differs depending on your socio-economic circumstances. Particularly I draw attention to how the introduction of new digital technologies contribute to the remaking of social relationships and how this financial inclusion can also lead to new forms of exclusion and hierarchisation.

To better understand who the target users, the consumer-cyborgs, of the Indonesian payment apps are, and to give context for the advancement of a 'less-cash' society, I briefly examine the

country's recent economic developments. I show how recent economic growth has led to increased wealth and income inequality but also what some scholars refer to as the emerging middle-class. I explore how the middle-class identity is bound in both a moral and intellectual social position, as well as in 'practices of emergence' (Simone and Fauzan, 2013) which include social markers such as consumption to match the perceived middle-class lifestyle. I draw also on the concept of 'cultures of servitude' (Ray and Qayum, 2009) to explore how the middle class constitutes itself through the employment of domestic workers. Together with the characteristic of an individualised approach to poverty in the discourse of financial inclusion, I show how these factors compound to frame those of lower income and opportunity as being moral subjects, setting the stage for their exploitation.

In the final section of the chapter, I return to the digital payment infrastructure itself. This section has a dual purpose. Firstly, I use the concept of 'social infrastructure' (Elyachar, 2010; Simone, 2004) to make the argument that driver-partners are mobilised as an extension of the payment infrastructure itself. It is their labour that enables and maintains the circulation of value through the ecosystem of the apps. I proceed by unpacking the concept of infrastructure itself to show how examining these payment apps with an infrastructural lens allows us to explore their underlying politics. Finally, I discuss the role of intermediaries such as Gojek and Grab in creating a digital interface for an existing social infrastructure, and in doing so, stabilising it into a form that best suits their needs. While the idea of P2P payments promotes ideas of equal exchange, I argue that these platforms exploit existing structural inequalities to configure driver-partners into a relationship of servitude to the consumer-cyborgs.

3.2 Fintech and the Pursuit of Cashlessness

In this first section, I examine the origins of the concept of financial inclusion, the 'turn to cashlessness', and the constitution of the Indonesian middle-class. I begin by asking where the emphasis on financial inclusion stems from to better understand why fintech companies are leveraging it as an argument in favour of their products and services. I show how paradigm shifts in the development industry led first to an increased emphasis on poverty alleviation, and how this goal came to be tied to neoliberal ideas about entrepreneurialism through microfinance.

This marks an important change in perspective, in which the global poor, and especially those deemed to be 'unbanked', were seen not just as in need of financial aid, but as a new and untapped market for financial services. Services that could be provided through new digital products from emerging actors from the technology industry. I show how some of these vested interests are engaged in what has been characterised as the 'global turn to cashlessness' (Sen et al., 2020). In

this view, financial inclusion is no longer just about providing digital alternatives to cash, but in some cases to replace it entirely.

Following some examples of what cash can then be replaced by, I show how these technologies can lead to new exclusions. Not just from the technological infrastructure, but from the vision of a modern society that these technologies represent. To contextualise this, I return to Indonesia to examine who the envisioned users of these payment apps may be and show how perceptions of a modern middle class create the premise for exploitation of those deemed improper economic subjects.

Technologies of ‘Poverty Alleviation’

The connection between actors in the fintech sector and the concept of financial inclusion can arguably be traced back to an important paradigm shift occurring within the international development sector. Around the turn of the millennium, the emphasis shifted towards ‘poverty alleviation’ and ‘human development’ (Musaraj and Small, 2018; Roy, 2010). Prior to this, poverty was generally articulated as a failure of national economic policies: failures which could be resolved by accepting loans from international development banks in exchange for bank endorsed policy changes to ““modernize” national economies” (Roy, 2010, p. 7). This common conceptualisation understands economic development as a linear process in which some countries are more advanced whilst others are considered to be ‘less developed’ or even ‘backwards’. A more critical interrogation might examine how these countries have either benefited or suffered from the effects of resource extraction under colonialism, and the resulting complex political, social, economic, and infrastructural dynamics.

One of the technologies that came to dominate public discourse as a ‘solution’ to the ‘poverty problem’ and method to ‘bank the unbanked’ was the concept of microfinance advanced by Muhammad Yunus, the founder of Grameen Bank (Roy, 2010, p. 22). The recipient of the Nobel Peace Prize in 2006, the Nobel Committee emphasised how Yunus’ vision had been to create “economic and social development from below” by helping people “break out of poverty” (Nobel Media AB, 2006). Yunus’ real innovation was to implement a new credit model “whereby small groups of poor women are able to secure small loans at reasonable rates of interest” (Roy, 2010, p. 3), an alternative to commercial banks which excluded them as ‘high-risk’ borrowers. The system relied on the women taking a loan collectively to fund their individual needs and relied on the group dynamic to ensure members continued to repay their share of the instalments until the debt was repaid. Notably, in this articulation it is still the responsibility of the individual to ‘break out of poverty’, aligning with Yunus’ ideas and ideologies in which “the poor are inherently

entrepreneurial” (Roy, 2010, p. 3). The language of ‘financial inclusion’ and ‘banking the unbanked’ took a point of departure in this push to engage the poorest within formal financial institutions, using the premise that such access is the missing link for poor people to tap into their natural entrepreneurship and to lift themselves out of poverty.

This language is similar to that used by the fintech companies in the previous chapter: factors such as ‘access’ to the digital economy, ‘trying harder’, and being taught more ‘responsible financial behaviours’ from the companies providing the digital solutions are assumed to lead to improved livelihoods for the poor. However, according to Ananya Roy (2010), the bigger issue here is that the issue of poverty must be tackled not at an individual access to capital level, but at the broader political-economic level. Poverty is not about an individual’s entrepreneurial spirit or lack thereof. It is about systemic failings, and “how markets fail the poor; how social capital operates through processes of power and domination; and how poverty interventions create an altruistic burden for the world’s poorest women” (Roy, 2010, p. 73). Despite initial enthusiasm for the concept of microfinance, there are also examples of the practice having harmful effects on loan recipients and their communities, again leading to new forms of exclusion. Roy points out that some researchers question the premise of microcredit as being able to effectively reduce poverty at all, with some even going so far as to consider microfinance a predatory practice (Rankin, 2002; Weber, 2002). Whether these initiatives stem from government policy, NGO’s, or fintech companies advancing their financial products, Roy encourages us to focus on what she calls the ‘politics of inclusion’ (Roy, 2018). As she puts it, to “attempt to formulate a nuanced understanding of how such exploitation and dispossession takes place, and most of all how they continue despite the devastations they usually wreck” (Roy, 2018, p. 19).

There is another important paradigm shift here, in which the poor go from being perceived as recipients of aid, to being a new opportunity for global markets. The provision of microcredit or other financial services for the unbanked becomes an opportunity for bringing what is known as the ‘bottom billion’, the billion poorest people in the world, into the global economy. Particularly into the specific financial environments of fintech companies such as Gojek or OVO. In ‘bottom billion capitalism’, as Roy also calls it, “Microfinance in particular, seems to contain the magic key to unlock the mystery of capital and enable the transformation of the bottom billion into a new frontier of capital accumulation” (Roy, 2010, p. 26). Roy quotes several actors from the tech industry who have become engaged in microfinance, showing their governing idea that microfinance can result in poverty alleviation, whilst also benefitting the financial actors engaged with providing access to credit. This perspective on microfinance takes inspiration from the influential text written by celebrity businessman C.K. Prahalad, called *The Fortune at the Bottom*

of the Pyramid: Eradicating Poverty Through Profits. Prahalad conceived of the poor as having an innate quality of 'connectivity' whereby the poor could be seen not only as a new market but as having forms of social capital and networks that the market could take advantage of (Elyachar, 2012). It was gaining access to this perceived innate resource that was the real goldmine to be gained from the unbanked.

Writing in 2010, Roy made beginning observations about the increasing role of Information Technology (IT) within this field. Microfinance in the form envisioned by Yunus relied on 'dutiful' women to pay back due to social pressure. As these new industry actors sought to generate profit from their poverty eradication, they needed alternative 'technologies for risk management'. These risk-management models deploy various criteria rendered even more accessible using platforms and apps that collect extensive transactional user data. As Roy puts it, such systems "historically redlined the poor, inscribing them as high-risk borrowers. Yet they are now being deployed to promote the democratization of capital" (Roy, 2010, p. 50). This argument is supported by Deborah James' work on debt in South Africa, in which she seeks to nuance what she deems the contradictory practices of such 'mediated capitalism'. As she points out, it is the loan takers who are scrutinised, subject to registrations, assessments, and increasing forms of algorithmic control. As James points out, 'being banked' will not solve the broader structural socioeconomic causes of poverty. She writes of these loan takers, "the ranks of those who aspire to join the new middle class, in both rural and urban contexts, far outnumber those who have succeeded in doing so" (James, 2015, p. 10). In her case, James finds that people across different social classes and income levels are encouraged by both state and private actors to accept new forms of credit, in what she also refers to as the 'deepening' of the financial sector, in which new poor people are enrolled as customers of these financial services.

My purpose here is not to engage deeply with the concept of microfinance, but to show where the language of 'financial inclusion' and the ideas about 'banking the unbanked' comes from. As companies like Gojek and OVO, and their investors such as Facebook, leverage narratives about financial inclusion as a justification for the value of their products and services, it is important to consider how these arguments also serve their own interests. On the one hand, the rhetoric of bringing the poor and unbanked into the digital economy 'for their own good', obscures how these companies also stand to benefit financially from the deepening of their customer base. As discussed in the previous chapters, access to phones and the use of communication platforms such as WhatsApp in Indonesia mean that there is an opportunity for these fintech actors to advance the use of their digital payment services as an alternative to formal financial institutions.



Figure 11: Banner image from GoPay 'Pay-later' web page. The text reads "Shop now, pay later!"

Secondly, it is worth reflecting on what it means for these companies when they speak of 'including' people into the 'digital economy', and what the specific financial environments have to offer their new customers. Visiting the website for Gojek's new 'Pay-later' service, a form of microcredit for consumption defined as P2P lending, one is met by a striking image of who their intended consumer is, shown in Figure 11. In the picture, a well-dressed young man swipes his phone excitedly, surrounded by paper shopping bags of the variety that allude to expensive purchases (Gojek, 2020a). The text reads "Buy now, Pay later!" It brings to mind the type of aspirational borrowing that James is referring to in the quote above, in which access to credit comes with the elusive promise of access to middle-class life and consumption. It is an image that seems far removed from the message that the poor would have better lives if they were just more financially responsible financial and able to use the company's app to access the digital economy.

Transactional Agency

Having thus explored the concept of financial inclusion, I turn now to the pursuit of 'cashlessness' envisioned by these fintech companies as the dominance of digital payments and introduce examples of how the introduction of these new forms of digital money can impact transactional relationships. In the context of the international development industry, fintech is often associated with the use of mobile phones as a tool for accessing financial services. It is this prevalence of mobile phones in locations where they are more plentiful than bank accounts that have caused mobile forms of money to be central components of poverty alleviation and 'financial inclusion' agendas (Rea and Nelms, 2017; Schwittay, 2011). It is important to note that these types of services extend beyond microcredit, into payments, international remittance services, and even include government benefit programs. Advocates for the use of financial technology, and specifically digital money forms, often argue that it will increase productivity, efficiency, security, and overall lower the cost of transaction for the poor (Donovan, 2012; Onoguchi et al., 2011). The

idea of cashlessness has become intimately entangled with the advocacy from public and private organisations for fintech as a tool of financial inclusion.

There is some validity to these arguments and there are situations in which digital payments offer genuine benefits and are becoming a valuable resource for those the industry purports to help. However, what cashlessness looks like depends on your point of view, and not everyone's perspective looks like the Gojek picture above. As Atreyee Sen and Johan Lindquist observe, "cashlessness is experienced differently across social classes" (Sen et al., 2020, p. xv), and thus should "not only be understood as taking shape across an uneven political and economic landscape but also as reshaping everyday social relations in a myriad of ways" (Sen et al., 2020, p. xvi). Sen and Lindquist identify what they call a "global turn to cashlessness" (Sen et al., 2020, p. xvi). Not just referring to the uptake of digital payments but also an ongoing effort to transition away from cash altogether on a global level. They identify this movement as gaining momentum in the aftermath of the global financial crisis in 2008 when consumer confidence in established financial actors fell and as alternative industries began to establish themselves. Rea and Nelms emphasise the role of the financial crisis yet point to the year 2007 in which the first iPhone was released alongside the launch of M-Pesa, as the origin point for mobile money and peer-to-peer payments (Rea and Nelms, 2017, p. 5).

One prominent and regularly cited example of this turn to cashlessness is the international partnership called the 'Better Than Cash Alliance' established in 2012. Not only does the group advocate for the increased use of fintech, they explicitly advocate for a transition *away from cash*, arguing that digital payments improve lives, reduce poverty and create 'inclusive growth' (Better Than Cash Alliance, 2020). These are familiar arguments to those advocating for financial inclusion. The Better Than Cash Alliance is hosted by the United Nations Capital Development Fund, and the 75 members of the partnership include NGOs, development banks, governments, as well as for-profit companies. Closer examination reveals that the partnership is financed by nine 'resource partners', including Mastercard, Visa, and Norwegian payments app Vipps. In addition, the partnership includes both the Bill and Melinda Gates Foundation and a venture firm called Flourish founded by Pierre Omidyar, founder of eBay. Arguably, many of these actors, and the many other global advocates for cashlessness, 'cash-lite', or 'less-cash' societies stand to benefit from the increasing digitisation of money, as the providers of the underlying platforms for these transactions (Donovan, 2013).

While there is a growing critical scholarship, most writing about financial inclusion is produced by development professionals who hold authoritative positions of expertise on poverty, and who also (re)produce ideas about the 'global poor'. By extension, they also hold rank over what

particular financial needs these digital payments are intended to solve (Kusimba, 2018; Roy, 2010). Writing about the integration of mobile money into existing life-cycle rituals in Western Kenya, Sibel Kusimba observes how these development professionals assume that the financial goals of the poor they wish to help are short term and easily technologically fixable. Kusimba gives the example of a woman who falls ill and who, together with her husband, unsuccessfully tries to raise money through their network for medical treatment. Upon her death, her husband receives more money than they initially needed for the medical costs as the network sends contributions for her funeral. The example was made in a report from the development sector and was cited as an example of the inefficiencies in the network. Its authors propose 'faster-acting financial devices' as a solution to the perceived problem (Kusimba, 2018, p. 19). What Kusimba points out is that accelerated money would not necessarily convert funeral donations into medical donations – there are limits to how much technology can manipulate time. Mobile money did not fundamentally change the purposes of economic practices; instead, it became incorporated within existing hierarchies of value formed by the specific socio-economic context.

I introduce this example to make two points. Firstly, these actors who are external to the communities they purport to help, hold and perpetuate many assumptions about the economic lives of the poor, reinforcing their arguments about the value of their financial products. This conceptualisation of financial inclusion also perpetuates a binary perception in which you are either included or excluded, rather than understanding it as a shifting state of being dynamically created by people themselves (Taylor and Horst, 2018). Secondly, not only do these 'unbanked' people become a new market for private businesses, but the vision of financial inclusion is enacted in a particular neoliberal way with its prioritised values of productivity, efficiency, and growth (Donovan, 2018). In practice, the implementation of 'financial inclusion' policies can in many instances be considered a loss of agency over your resources, as the digital forms of money are channelled through the infrastructures of private companies. In his research on financial inclusion in South Africa, an interlocutor tells Kevin Donovan that "financial inclusion means your money isn't with you," and as Donovan observes, "if your money isn't with you, someone else probably has it" (Donovan, 2018, p. 171). In practice, measures to 'include people' in formal financial structures, particularly through cashless payments, can also lead to increased vulnerability and financial instability.

For instance, access to personal financing in the form of credit cards issued by private retailers lead to new forms of financial practice where access to credit can be shared by literally circulating credit cards (Ossandón et al., 2018). Meanwhile, this easy sharing of credit can also lead to new complex social debts. Inability to repay debts in someone else's name can lead to long-term

exclusion from credit access and new social tensions (Kolling, 2020). In other situations, accruing debt with a private digital cashless service means that the private companies can simply lay claim to any incoming money as repayment of the debt (Donovan and Park, 2019). This automatization once again reduces the agency of the people using these services to act in accordance with their needs, as the companies effectively put themselves at the front of the creditor line, capitalising on an existing liquidity crisis (Donovan, 2020). As James pointed out earlier, those providing access to easy credit are under-scrutinised, and the loan takers increasingly under forms of algorithmic control.

Meanwhile, these digital infrastructures quickly come to dominate the socio-economic context making it difficult to opt out. In some scenarios, the rapid introduction of digital financial inclusion initiatives can mean that “integration into the formal financial and economic systems is not really voluntary” (Loubere, 2017, p. 17). During my fieldwork, I found this to be an increasing worry among my interlocutors; that participation in the ‘digital economy’ would become non-optional. For example, when the possibility of online booking of transport became an option through the apps, people increasingly relied on the platform infrastructure rather than looking or waiting for conventional offline options. This forced more and more people into the position of becoming online drivers. “*Kalau nggah ikut, ketinggalan,*” one older taxi driver told me in 2018. If you don't join, you get left behind. He estimated that over 60 per cent of his rides were now booked through the apps. Though by 2019, others estimated that the apps were responsible for as much as 80 per cent of their bookings. Meanwhile, there are people who for various reasons will be ostracised from access, for instance, due to lack of citizenship, lack of ID, lack of phones, not to mention questions of accessibility stemming from discrimination against individual's identities or disabilities. Writing about some of these intersecting forms of discrimination and exclusion, Camilla Ida Ravnbøl (2020) shows how the introduction of cashlessness at music festivals in Denmark impacted the Roma who relied on income from bottle collection. Forced to adapt and change their working strategies in an environment that was not designed for their needs, Ravnbøl 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). The impact of this cashlessness initiative was furthermore so different for the bottle collectors and the other festival guests, that though everyone had purchased the same ticket, the introduction of the cashless initiative was intended to benefit one group of festival guests. Indeed, as Lana Swartz points out when first introduced in the USA, credit cards also alluded to a form of aspirational modernity in the form of a cashless society. However, participation in that vision of modernity remained heavily socially regulated, and particularly Black Americans were likely to have their cards declined as a

form of payment even when the technical infrastructure was in place (Swartz, 2017). The Diner's Club credit card "could only provide a privatized version of modernity that reflected and reinforced existing social difference" (Swartz, 2017, p. 86). Those who remain alienated from access are excluded not only from payment infrastructures but also from the vision of the modern society that cashlessness represents.

Proper Economic Subjects, and Those Who Serve Them

The question of who is included in the vision of a modern, cashless economy takes us back to the imagery of the Gojek 'Pay-later' website and the question of who the imagined users of the digital payment system, Makarim's consumer-cyborgs, really are. In this section, I explore the concept of the middle-class in Indonesia and its entanglements with consumption, and how this relates to societal hierarchical positions which are arguably reinforced and reproduced within the app infrastructure. My intention here is not to enter into a discussion about the Indonesian middle class, or to define it as a demographic category of analysis. Rather, I am interested in how the idea of the middle class lends itself to certain behaviours and experiences, and how the middle class is constituted in this way through the reproduction of these ideas: the middle-class lifestyle is expected to lend you more cultural capital, a form of social contract, in which you are entitled to having certain socio-economic expectations (cf. Stout, 2019). These visions of the middle class are reproduced in many ways throughout the digital payment apps and reflect certain ideas about its users. They are also at odds with the visions of the very marginalised and unbanked populations that these same fintech actors argue that their apps will benefit alongside the sentiment of equality implied in a peer-to-peer transaction.

Returning briefly to the agenda of Indonesia 4.0, financial inclusion, and poverty alleviation, it is worth noting that Indonesia has been going through massive economic growth since the political and economic instability of the late '90s. In fact, according to data from the World Bank, the poverty rate in Indonesia fell from 63.2 per cent in 1998, to just 3.6 per cent in 2018 (World Bank, 2020).²⁰ The narrative of Indonesia's economic growth is widely lauded, as has been President Jokowi, whose strategy of infrastructural development is often credited. However, this ignores the fact that income and wealth inequality is also growing rapidly and as Oxfam International notes, if you were to adjust the poverty line from 1.9 to just 3.10 USD per day, the percentage of people living in poverty in Indonesia increases from 3.6 to 36 per cent (Gibson, 2017, p. 5). Indonesia is now ranked 6th in the world in terms of income inequality, with the 4 richest men in the country

²⁰ Defined here as the percentage of the population living for under 1.90 USD per day.

sharing a combined wealth of more than the poorest million people (Gibson, 2017, p. 8). In the past few years, the government has attempted to address these growing economic disparities with an increasing emphasis on 'equitable' economic growth. This has been mainly through funding social programs and infrastructural development (Negara, 2017). Meanwhile, income wages are notoriously low in Indonesia and in fact the lowest in Southeast Asia, with employment especially among youth remaining low making it difficult for those at the bottom of the economic pyramid to improve their livelihoods (Nastiti, 2020). In Jogja where my research takes place, the minimum wage in 2016 was assessed by Oxfam as providing only 63.9 per cent of household expenditure (Gibson, 2017, p. 21). As pointed out earlier, these are broader systemic issues that cannot be solved with an app. Exacerbating existing problems, a comprehensive omnibus bill on 'job creation' was passed in 2020, heavily criticised by local activists and labour unions for its undermining of labour protections to create a more 'flexible' workforce (Da Costa and Widiyanto, 2020).

Rather than centre on these extreme divisions between the wealthiest and their increasing distance to the poorest, I want to linger on the ways in which Indonesia's economic development has impacted upon what many scholars refer to as the 'emerging' middle class. I will focus on the middle-class relationship to those who are most vulnerable to exploitation in the cashless vision of Indonesia 4.0.

The definition of the Indonesian middle class has always been murky and full of contradictions, and as a group of people, they have been poorly understood (Budiman, 2011). In an uneasy relationship since the 1990s, the emerging middle class owed its increased wealth to the opportunities offered by the state in terms of stable income and industrial development (Klinken and Berenschot, 2014). As the middle class benefited the most from the political developments at the time, they were also publicly characterised as silent, if not complicit in the political events surrounding the oppressions that took place of the poorer classes and those with dissenting political views. Manneke Budiman (2011) argues that this image is complicated by the fact that many of these same people participated in the largely student-led protests demanding that President Suharto step down and provided critical logistical support to the political movement. According to Budiman, the term middle class in Indonesia is one that is fluid and can "accommodate plural identities and practices" (Budiman, 2011, p. 488). For Budiman, the emphasis is on expanding our understanding of the middle class beyond key identifiers such as urban residence, 'modern' education, profession, and what he calls a 'consumer lifestyle'. The middle class is complex and heterogenous and "assumed to provide moral and intellectual leadership to the masses" (Budiman, 2011, p. 495).

The conceptualisation of the Indonesian middle class as being tied to consumerism is a dominant narrative in literature. One that is often connected to the recent economic growth which has given more people access to the type of disposable income that enables the purchasing of consumer goods (Ansori, 2009; Schlogl and Sumner, 2014). While the concept of a *consumer* class may provide a clearer demographic category, it is precisely the “conceptual vagueness and compositional heterogeneity of a ‘middle class’” (Simone and Fauzan, 2013, p. 281) that makes it analytically interesting. What is particularly compelling in this context, is the way in which the social construction of the middle class is heavily influenced by ideas about what constitutes a desirable and worthy life, and how participating in consumption can be a step towards that goal (Naafs, 2018).

To give an example of this, I point to the work of AbdouMaliq Simone and Achmad Uzair Fauzan (2013) who show that the concept of ‘middle-class’ in Indonesia is bound with ‘practices of emergence’: becoming middle class is not something that happens to you, instead it is something you do. They found that residents in ‘emergent’ neighbourhoods were constantly engaged in redrawing the lines of social collaboration with their neighbours. These neighbours were under pressure to enact behaviours that they felt would better position them for a middle-class life and to “maximise their eligibility for eventual success” (Simone and Fauzan, 2013, p. 293). In one example, a couple considered relocating to a more distinctly middle-class residence, even if it meant losing valuable social ties and going into debt. Simone and Fauzan write:

“While the composition of middle-class status may be heterogeneous or ambiguous, the imaginations and lifestyles associated with this status usually fall within a circumscribed range of sensibilities and expectations. Increasingly the message seems to be: you must do everything for yourself and only have yourself to blame.” (Simone and Fauzan, 2013, p. 286)

These residents on the cusp of the middle class would try to conform and outwardly signal their middle-class aspirations, collectively remaking the standards of the community. They are heavily influenced by the “particular lifestyles widely proffered through media and popular impressions as to what a suitable middle-class residential district should entail” (Simone and Fauzan, 2013, p. 284). The act of moving away from your local environment to a modern building is also an act of separation, not just of social ties but of the expectations, obligations, and social norms binding you to share your resources. Investing your limited means in property, even if it entails entering debt, is also a means of rendering this value less accessible for extraction by others. Middle-class life is one of increased individualisation. According to Simone and Fauzan, these residents were aware of the possibility of losing the skills they had developed, in terms of operating within their social

community, but found that this was the sacrifice they must make to manifest their middle-class aspirations.

Several other studies point to how this aspirational middle class engages in 'lifestyling' by consuming things that invoke the 'middle-class touch' such as spending time at the many mega-malls that have surged into existence in the past decades (cf. Leeuwen, 2011; Roitman and Recio, 2020). In particular, emphasis is placed on how the middle-class lifestyle thus becomes entangled with having digital money, either as a credit, debit, or ATM card. As Suyanto et al. point out, specific to the type of transactions available at a mall, the "existence of 'plastic money' for the middle class is not just a status symbol, but also a practical and real need that facilitates various economic transactions" (Suyanto et al., 2019, p. 7). Indeed, it brings to mind Makarim's consumer-cyborgs, whose lives and consumption are made even easier through the existence of digital payments as manifested in the Gojek app.

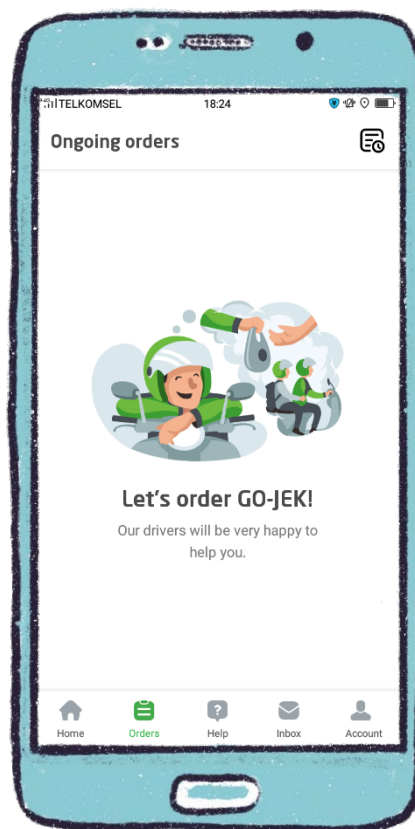
Meanwhile, these middle-class aspirations for modern living and mall consumption also push out those elements of the city deemed too messy or chaotic. In Jakarta, this has led to conflicts over housing, as poorer citizens are pushed out in favour of new and expensive developments (Irawaty, 2018; Simone, 2014). In her analysis of 'market emergence' in Indonesia, Lisa Tilley (2016) makes the astute argument that this dispossession of the urban poor is enabled in part due to the perceptions held by the middle class. According to Tilley, both the elite and middle class "presented the urban poor as improper economic subjects and therefore as persons without a place in productive and consumer life. This perception of the urban poor helps to make them expropriable and thus becomes the condition of possibility for their dispossession" (Tilley, 2016, p. 288). If being middle class is related to a form of moral and intellectual superiority, and increasingly the responsibility of the individual to materialise, then the reverse is the further chastisement of those falling outside of these expectations. In relation to the Indonesian apps, I want to return for a moment to Ananya Roy (2010) and a brief story that she relays about a group of women who all work as executives in the microfinance industry in the Philippines. Roy writes that these women do not see themselves as part of the elite wealth, but in their conversation, they also clearly distinguish themselves from the poorer domestic workers that they employ. According to Roy, the women articulate their employment of these workers, who they perceive as being of a lower class than themselves, almost as a charitable act:

"In these reflections, wage-earning labor is presented as servitude and wages as charity. It is in this way that the poor are folded into the structure of microfinance – not as labouring bodies but rather as moral subjects, as either bootstrapping entrepreneurs or as lazy encroachers." (Roy, 2010, p. 193)

Roy references the concept of ‘cultures of servitude’ formulated by Raka Ray and Seemin Qayum (2009). Ray and Qayum explore the relationship between employers and employees in the context of domestic labour and practices of servitude, specifically in India, demonstrating how employers constitute themselves as middle- or upper-class specifically through the act of engaging servants at all. They show how these relations of interdependence and exploitation become normalised and reproduced within that labour (Ray and Qayum, 2009). With Gojek and Grab, anyone can easily employ a temporary servant. While there is a lot of excellent research about how companies like Uber, Lyft, or their Southeast Asian counterparts Gojek and Grab can be exploitative towards drivers (cf. Dubal, 2017; Nastiti, 2017; Rosenblat, 2018) it is also worth considering the ways in which these apps enrol customers in that exploitation, and how this positioning of exchanging parties contributes to the reproduction of unequal relationships.

3.3 Infrastructures for Consumer-Cyborgs

When Nadiem Makarim referred to Gojek consumers as cyborgs, he was answering a question he had posed about the character of the problem that Gojek was trying to solve in the world; it “was simply a problem of mobility, right. How do you get a human, an object, like food, or money, or value, to move in the fastest possible, cheapest, most convenient way, using one tool?” (Wirjawan, 2020). Makarim’s answer is the app. But the app itself does not result in the rapid, cheap, and convenient circulation of people, objects, and value. That circulation is facilitated by the human labour performed by the driver-partners. When Makarim uses language such as ‘cyborg’, or ‘operating system of the world’, he foregrounds technological innovation and reinforces the idea of a seamless automated process by which this circulation takes place almost magically. Here, the driver-partner is positioned in service of the consumer-cyborg, the intended user of the app and beneficiary of its cashless payment system.



*Screenshot 3: A driver thinks happily about helping customers.
1 March 2019.*

In the following section, I take an infrastructural view to understand how the apps mobilise driver-partners in service of the consumer-cyborg and thus the digital economy. By exploring the concept of social infrastructure, I draw attention to the role of human labour in facilitating and maintaining the circulation of value through the apps. The infrastructural lens also allows for an

examination of how this labour is rendered invisible through the language of automation and how this can lead to its devaluation. My purpose is to establish an understanding of the figure of the driver-partner as an extension of the app, and thus its digital payment infrastructure. I proceed by discussing the value of taking an infrastructural perspective to the analysis of these payment apps, as it allows us to examine more closely the relational dynamics imposed on exchanging parties by the app infrastructure. Finally, I discuss how companies such as Gojek and Grab have benefitted by inserting themselves as an interpretive interface on an existing infrastructure. In doing so, they create momentary stabilising parameters for the exchanges that happen through their platform, thus controlling the conditions of transaction.

Channels and conjunctions

To explore how these drivers comprise a critical social infrastructure in the context of digital payments, I will first introduce two foundational examinations of the concept through the work of Julia Elyachar (2010, 2005) and AbdouMaliq Simone (2015, 2004). As scholars with diverging backgrounds and in different fields, their conceptualisations differ. Simone conceptualises people and their conjunctions as infrastructure, while Elyachar focuses on the communication channels created by people as interesting objects of study in themselves. By reviewing their work, I aim to explore how driver-partners can be understood as a critical infrastructural element of the Indonesian digital wallets.²¹

Elyachar's ethnographic research takes place in the workshops and markets of Cairo, Egypt. In her definition infrastructure is not concerned with the production of things, but with their circulation. She argues that capitalism depends on infrastructure to provide channels that bring goods and services to relevant markets. In her work, Elyachar provides a highly detailed rendering of specific processes of exchange taking place in this context and describes the ways in which common understandings of the informal economy depended on trust between community members, or what Prahalad earlier was referring to as 'connectivity' (Elyachar, 2005). She makes the point that these networks are not owned by any individual; they are developed and invested collectively to constitute a community resource. A critical element of this economy is the communication channels that enable this network to exist. From her fieldwork, Elyachar introduces a group of women from a variety of socio-economic backgrounds engaging in 'phatic communion': practices

²¹ Just prior to the submission of this thesis, AM. Simone published a new article re-examining his conceptualisation of 'people as Infrastructure' (Simone, 2021). While I have not had the opportunity to engage deeply with this text in the thesis, I believe that my empirical work aligns well with Simone's call for additional examination of the increasing role of technical devices in the intersections of collective social life that form 'social infrastructure'.

of sociality that bring these communication channels into being and ensures that they continue to exist.

Elyachar draws here on a term used by Bronislaw Malinowski (1936) to describe the social practice of communication, where the activity is not just about talking but a form of 'social action'. Sometimes dismissed as gossip, phatic communion is a type of communication that establishes connection and builds relationships between individuals as well as the broader community. During my fieldwork in Indonesia, a neighbour would frequently ask me where I was going as I passed his laundry shop in the morning. The purpose of his question was not purely to seek information about my plans for the day, but to position me and my activities in relation to the community I was now living in. As a neighbourhood hub, the laundry shop also included a hairdresser and an aerobics and dance studio, all managed by his wife. My comings and goings and the theme of my research quickly became public knowledge, and I soon found myself enrolled in various studio activities. Elyachar argues that such phatic communion leads to the creation of communication channels. These are not channels in any physically material sense but are spaces through which information can flow. They are established through repeated interaction and exchange, in public and private spaces such as the coffeehouses in Cairo or snacking together after aerobics in my Jogja neighbourhood.

For Elyachar, conceptualising this 'connectivity' as social infrastructure is a way to acknowledge the labour and skill required to make and maintain such complex, subtle, and flexible channels of communication and economic exchange. The women of Elyachar's research engaging in phatic communion are contributing to the maintenance of these communication channels, and she describes them as maintenance workers of the "essential infrastructure of economic life in Cairo" (Elyachar, 2010, p. 454). It is easy to dismiss the importance of the work that these women are doing, and according to Elyachar, we lack the language to understand and properly value this type of maintenance work. Elyachar thus introduces the concept of phatic labour, to theorise the link between "communicative practices of sociality, the creation of infrastructure, and the use of that infrastructure in economic projects" (Elyachar, 2010, p. 460). Phatic labour gives power to day-to-day social communication, which beyond sharing information, contributes to the establishment of channels, norms, and practices for how that information flows. The women in Elyachar's research, form the spaces that allow for both 'physical proximity' and 'psychological contact' which these channels depend upon. Elyachar argues that the work that the women do here, can be defined as labour, in that it is these social practices that enable other forms of labour to generate 'surplus value' as conceptualized under capitalism.

For Elyachar, it is the communication channels that constitute the social infrastructure and the

people who engage in the social practices that contribute to both its creation and maintenance. AbdouMalik Simone takes a slightly different approach to the understanding of social infrastructure. Simone's research centres on urban life with particular emphasis on the lives of people who might be considered socio-economically marginalised. Across various cities, such as Johannesburg and Jakarta, Simone describes how people navigate challenging conditions of living in fragmented social spaces, with limited or zero support from public institutions. They do so, Simone argues, through activities that intersect across residents with diverging backgrounds, resources, and purposes. Writing about Johannesburg, he argues that these "intersections, particularly in the last two decades, have depended on the ability of residents to engage complex combinations of objects, spaces, persons, and practices. These conjunctions become an infrastructure – a platform providing for and reproducing life in the city" (Simone, 2004, pp. 407–408). The conjunctions describe simultaneously occurring moments in which the actions of residents momentarily align. This is regardless of their individual motivations or objectives and these moments form critical spaces for transaction. In Jakarta, Simone found that there were prolific and wide-ranging connections between different residents, which these same people would go to great lengths to downplay (Simone, 2014).

In a different essay, Simone describes how infrastructure can be considered something that directs or channels a force, the way that a pipe channels water or a cable channels electricity. Like in Elyachar's interpretation, it is infrastructure that determines the flow of something along specific channels and thus "what we come to know, feel and be is largely a matter of infrastructure" (Simone, 2015, p. 375). The process and outcomes of these conjunctions depend on who the participants are and their experience with navigating in this type of space. Thus, it is people and their activities themselves that effectively comprise the transactional infrastructure. According to Simone, these infrastructural relationships can be considered as an effort to stabilize the field of interaction in an unstable environment through the encoding and designations of people and spaces. Especially important as the conjunctions generate novel and complex compositions between residents with diverging means and resources, bringing with them new emergent interdependencies. Hence "People as infrastructure describes a tentative and often precarious process of remaking the inner city now that policies and economies that once moored it to the surrounding city have mostly worn away" (Simone, 2004, p. 411).

The conventional motorcycle taxis in Indonesia, *ojek*, fill the gaps of formally organised public transport, serving those people who do not have access to private vehicles or drivers (cf. Qadri, 2020a, 2020b). Sometimes you might find them waiting around a hand-painted 'Ojek' sign. In some cases, you might even store the phone number of a reliable driver for another time, as

Makarim often describes doing prior to his invention of Gojek. While going for a walk in her neighbourhood, one interlocutor, an academic at the university, waved at a passing motorcyclist and explained that he was an ojek from the village who she had met and who she now paid to transport her daughter to school every morning. Outside of such arrangements, prices are negotiated before every trip and the familiar customer will know what to expect for certain distances at certain times of the day. These drivers provide critical infrastructure for mobility, especially in contexts where more access to more formalised options or private transport are limited.

Whether through conjunctions or communication channels, these social infrastructures operate as momentarily stabilizing relational parameters. When you encounter an ojek, social norms around the respective roles of driver and passenger inform the premise of your engagement. These momentary stabilisations of exchange relationships allow information and resources to flow forming critical transactional infrastructure. Drawing on Elyachar and Simone, one could characterise social infrastructure as someone that ensures the circulation of resources, directing, channelling, and maintaining the flow of information, people, objects, and value. A temporary stabilisation and composition of social and economic relations.

Stabilisation and Material Embodiments

I want to look at the concept of infrastructure more broadly to see how it applies to the case of digital wallet apps and online drivers in Indonesia. Tracing the origins of the term infrastructure to its roots in French engineering, Ashley Carse (2017) describes how its meaning continues to change. Originally, the term was used to distinguish the work underlying suprastructures, for instance, the components of a railroad that existed underneath the rails, but which gave it stability and allowed it to function. For Carse, the analytical value in the concept of infrastructure is in “the logics of depth and hierarchy that manifest in design, management, and maintenance” (Carse, 2017, p. 35). Importantly, these infrastructural elements are not immediately visible to those who are unfamiliar with how such a system works, or to those who do not see a connection between various elements in a broader system. Similarly, an outsider to the village in Jogja may not know how to interpret the signs that would allow them to identify an ojek, and even less likely how to navigate the expected terms of the exchange. Describing this characteristic of the relationality of infrastructure, Brian Larkin (2013) outlines what he calls the ‘peculiar ontology of infrastructure’ as being both a thing and simultaneously the relation between things. Susan Leigh Star (1999) also describes this relational characteristic of infrastructure; how a pipe is seen and understood depends on whether you are a plumber, a homeowner, or an urban planner, always in relation to something else: infrastructure emerges when a given technology requires a more complex system

of support. A car, for instance, loses its meaning as a tool for mobility without the underlying infrastructures such as fuel supply, roads to drive on, and protocols for driving. Each infrastructural element cannot be meaningfully studied when removed from its context but must be understood in relation to the people and things it engages with as a broader socio-technical system (Hughes, 2012).

The materialisation of a certain system, such as that of digital payments in Indonesia as it is now, is not a given outcome. For both Larkin and Star, complex political questions are underlying the design, standardisation, management, and implementation of these socio-technical systems. Certain conceptualisations and particular politics become engineered into the systems around us by the people who conceive of, design, build, and operate them. Star describes this process as the encoding of 'master narratives', which speak "unconsciously from the presumed center of things" (Star, 1999, p. 384) and thus form specific understandings about the world. For instance, the implicit hierarchical arrangement of 'male' and 'female' categories in a drop-down menu, which disregards any alphabetical logic, but also reinforces a binary understanding of gender. The outcome is that neither technologies nor infrastructures can be considered neutral entities: they have been created by people who bring with them their own ideas about the world.

Larkin argues that infrastructure makes these more abstract politics, norms, and values tangible in a materialised form, available to study in a way that ideas themselves are not. Larkin points to research about the organisation of infrastructures of water supply in India and South Africa (cf. Anand, 2011; von Schnitzler, 2008), identifying that what may at first seem like a neutral technological challenge expands to broader questions of morality and citizenship and the 'techno-politics' of infrastructure (von Schnitzler, 2016). Similarly, major road developments can be about mobility but also be entangled with alluring narratives of political freedom and economic prosperity even as the physical infrastructure itself crumbles (Harvey and Knox, 2012). Larkin, therefore, argues that infrastructures "form us as subjects not just on a technopolitical level but also through this mobilization of affect and the senses of desire, pride, and frustration, feelings which can be deeply political" (Larkin, 2013, p. 333). As I demonstrated in the first chapter, the narratives around cashless payments in Indonesia are heavily entangled with narratives of a modern, cashless Indonesia, but also with President Jokowi's legacy of infrastructural development. Importantly, Larkin also addresses how these types of political motivations take place on both the individual and broader societal level, "the way technologies come to represent the possibility of being modern, of having a future, or the foreclosing of that possibility and a resulting experience of abjection" (Larkin, 2013, p. 333). Thus, we can speak of a mutual shaping: on the one hand, the things we create are imbued with our own ideas about the world, our politics,

but they also shape us, as we are swayed by the enchantment of infrastructure and the promises that we come to associate with them (Harvey and Knox, 2012).

In her call for an ethnography of infrastructure, Star makes the point that infrastructure is often invisible, rendered visible only during its breakdown. Larkin by contrast draws on Carse among others to make the point that infrastructure is not inherently invisible, rather attention should be paid to how that visibility is mobilized: “The point is not to assert one or another status as an inherent condition of infrastructures but to examine how (in)visibility is mobilized and why” (Larkin, 2013, p. 336). What is visible, when, and for who may vary greatly depending on your vantage point. Larkin makes the second point regarding what he calls the poetics of infrastructure and how form is loosened from function. He gives the example of a building project where the pipes of a house were not connected to anything. Nevertheless, the pipes existed as numbers in a spreadsheet, serial numbers on an inventory, and perhaps as a ticked box on a to-do list. These are all representations of the thing, all of them “material embodiments of a pipe in differing forms that allow them to move in differing circulatory regimes. Pipes turn out to be documents” (Larkin, 2013, p. 335). For instance, while the Indonesian government may have reached their target of 75 per cent of the population being financially included, I recall the women telling me about their abandoned bank accounts and lacking a relationship to the financial institution itself. The poetics of infrastructure speaks to the hierarchical rearrangements of infrastructure, in this case privileging the aesthetic purpose over its functionality.

Infrastructure is a form of stabilization even if it is only temporary. I would argue that though emphasis is often placed on the distinction between formal and informal economies, and the introduction of the Gojek app could be viewed as a formalization of ojek work, it can be conducive to think of this ‘infrastructuring’ not as formalization, but as a process of stabilisation (Star and Bowker, 2006). Of course, the way in which this stabilisation occurs is determined by those engaging with it, be it government legislators implementing e-money regulation, or the programmers designing digital wallet functions for ojek drivers in an app. An infrastructural perspective also allows us to examine which aspects of this stabilisation are rendered visible to which people. Therefore, it is worth noting that when Makarim asks the question of mobility, how “do you get a human, an object, like food, or money, or value, to move in the fastest possible, cheapest, most convenient way, using one tool?”, he uses the language of automation. The consumer is a cyborg, and the app is the operating system of the ‘real’ world. The drivers are infrastructured away, their labour rendered invisible. This type of language is also often used to describe AI, in which the veneer of platforms and interfaces conveyed by tech language renders invisible the human labour that goes into training algorithms, into ‘teaching’ machines, or

moderating and editing content. Mary L. Gray and Siddharth Suri (2019, 2017) describe this labour as 'ghost work' and compare the resulting illusion to that of the Wizard of Oz. Revealed finally as simply a human 'pulling levers from behind a curtain', that the "creation of human tasks in the wake of technological advancement has been a part of automation's history since the invention of the machine lathe" (Gray and Suri, 2017). Gray and Suri call attention to the point that by rendering them invisible, the labour of the workers in the 'ghost economy' is easily devalued, both monetarily, socially, and in terms of labour rights and protections.

Drivers themselves are not invisible to app users, though I would argue that 'the driver' as configured by the app and defined contractually as driver-partner is more difficult to see. The driver-partner is subject to specific conditions that govern their labour, enforcing forms of behaviour considered desirable by the app, meaning behaviours that optimise the service for the consumer-cyborgs. Alex Rosenblat (2018) has provided detailed insight into the inner workings of the ride-hailing company Uber, contributing to challenging the narrative of the 'sharing economy' to what is now more commonly considered to be the 'gig economy', in which people undertake labour precariously rather than under stable employment. In their analysis of the 'ghost economy', Gray and Suri make the additional observation that current economic predictions show that by "2033, economists predict that tech innovation could convert 30% of today's full-time occupations into augmented services completed "on demand" through a mix of automation and human labor." (Gray and Suri, 2017). Although the gig economy is defined by a precarity of labour rather than stable conditions of employment, I would argue that it also implies certain ideas about flexibility and choice regarding accepting work. By contrast, the term 'on-demand' labour more accurately conveys Makarim's figuration of drivers inside his vision for the mobility of people, objects, and value. In answer to his question, quoted above, I would offer a simpler answer: *drivers*. On-demand and just a swipe away, it is the fast, cheap, and convenient labour of drivers that enables the circulation of value in the service of customers and the companies providing the accessible interface.

Rendering Things Visible (For Extraction)

Simone (2004) argues that urban residents must be in a constant state of preparedness, able to refigure or relocate their perceptions regarding either their own or other's transactional positions. He describes how this ability to always relocate themselves and others allows for broadened understandings of their social relationships, giving the space to render certain things either invisible or highly visible as needed. This also creates what Simone calls an 'economy of interpretation'. Here, an array of actors can "insert themselves as middlemen who might provide a fortuitous, even magical, reading of the market "between the lines"" (Simone, 2004, p. 426).

Being able to understand where the conjunctions occur, and to provide translations of the market to both insiders and external participants is itself a valuable skill. Indeed, by creating the driver-partner Gojek and Grab provide the stabilising relational parameters for exchange between the consumer-cyborg and the ojek driver, making an existing transport infrastructure hyper-accessible. These apps are providing an interface for interpretation of an existing economy, but also inserting themselves as the intermediating infrastructure of the transaction. In Simone's example, this becomes a constant tension between the urban residents and the external actors wishing to make the city more 'readable' for those who are not able to make these interpretations themselves. For these external actors, such as city authorities, planners, and corporate actors, the city "is to be an arena where spaces, activities, populations, flows, and structures are made visible, or more precisely, recognizable and familiar" (Simone, 2004, p. 426). For Simone, these are steps that make the resources of a city extractable to those not well versed in its complex social infrastructure.

Though their interpretations of what exactly constitutes social infrastructure differ, Elyachar also observes how tensions arise when efforts are made by external parties to render the infrastructure 'readable'. Drawing on the work of linguistic anthropologist Paul Kockelman (2010), Elyachar points out that a channel only works if the signs communicated through it can be correctly interpreted by the receiver – this mutual understanding is in part what the phatic labour of the women in her example ensures. However, for external actors, the infrastructure must first be rendered visible, and its signals interpreted for its value to be mobilized. In the context of markets in Cairo, Elyachar describes how these interpretations are facilitated through reports from local NGOs, written by actors who are themselves integrated within the social infrastructure. Elyachar describes how corporate actors from the 'payments-space' thus were able to take advantage of existing communication channels in the distribution of their financial products, finding a "ready-made infrastructure for their investments" (Elyachar, 2010, p. 461).

In both situations, these external actors are leveraging existing, complex, and carefully maintained social relations to extract value. This practice of extracting and accumulating wealth from 'things' created by others is what Anna Tsing (2015) refers to as salvage accumulation. This is a combination of the concepts of accumulation concerning the amassment of wealth under capitalism (Harvey, 2011), alongside the concept of salvaging which Tsing describes as the conversion of things with other histories of social relations into capitalist wealth. I want to return to a point that Elyachar makes when she critiques Prahalad's conceptualisation of 'connectivity' as being an innate skill of the poor rather than the outcome of careful labour. Elyachar's argument is not that such infrastructure should not be used by others, but that "social infrastructures of

communicative channels can be analyzed and defended as a collective resource for which recompense should be paid or rent paid for use" (Elyachar, 2012, p. 121). When Gojek and Grab recruit drivers, they do not provide any training on how to be a driver, beyond the mechanisms in the app that inform the expectations of how to be a driver-partner. Once they have invested in a vehicle, drivers must acquire this knowledge themselves and deploy it in their service to the customer. Thus, the app companies can simply extract a portion of the wealth generated by the investment the drivers themselves have made into their trade. Both companies actively recruited and benefited financially from the existing infrastructures of mobility in Indonesia. Furthermore, by deploying their own, dominant infrastructure as an access point for this existing system, they also implement a dominating version of this infrastructure that is governed by their specific techno-politics. As Elyachar concludes in her work on how processes of formalisation lead to dispossession, policies like "forced privatization and structural adjustment are a form of violence perpetrated against those who pay a real price in their health and very lives" (Elyachar, 2005, p. 214). What was once a flexible and adaptable momentary stabilisation of socio-economic relations, becomes fixated on certain transactional dynamics encoded by the companies themselves. The app configures driver-partners as on-demand labour and an access point for the digital economy for the app's users, configured as consumer-cyborgs.

3.4 Conclusion

There can be real and meaningful value to digital transactions in instances where cash might be inconvenient. For example, in situations where it is difficult to transport, or where carrying a large amount might leave you vulnerable to theft. However, when companies such as Gojek and Grab leverage arguments about financial inclusion as an inherent value of the expansion of their services, it is important to examine the concept more closely to understand what it is they imagine people are being 'included' into, and how they imagine this is going to improve people's livelihoods.

As I have shown in this chapter, much of the underlying ideology of 'financial inclusion' through 'cashless payments' presumes that there can be individual solutions to poverty. It is presumed, that by giving a poor person 'access' to financial services or to selling their products and services on a platform, they will be able to generate income and thus lift themselves out of poverty. This ignores the complex structural dynamics that lead to socio-economic inequalities such as the increasing income and wealth disparities in Indonesia. A similar logic casts ascendance to the middle-class as a personal responsibility which in turn construes being afflicted with poverty as a personal failing. These are stigmatising moral judgements, which lead to the legitimisation of

exploitation of those deemed less financially responsible or less diligent, less in alignment with what is considered publicly acceptable.

In introducing the app infrastructure, Makarim himself describes how his formalisation of drivers, increased their public acceptability, and as I will examine in the coming chapters, introduced easy evaluative mechanisms for whether or not they were being “bootstrapping entrepreneurs or as lazy encroachers” (Roy, 2010, p. 193). By inserting themselves as intermediaries, these companies implement the stabilising parameters for engagement between the exchanging parties. Negotiation of price and destination are all determined algorithmically, there is no need to develop the contextual sensitivity that would allow you to navigate the exchange otherwise. The company provides you with an interpretation, configuring its users through the interface of the app. Controlling the conditions of this stabilisation, not only means that the companies can introduce mechanics leading to, for them, desirable behaviours but also can extract value from both the exchanges and the labouring bodies of the drivers.

Part of this process includes the infrastructuring of drivers into the digital payment system. By this, I mean the way that the figure of the driver-partner becomes integral to the process of introducing money into the digital system and then contributing to its continued circulation. Through incentivising mechanisms and the conditions of the app environment, drivers become the front-line workers of the push to enter people into the digital economy, but through their work also contribute to the continued circulation of digital money within the system. Meanwhile, the language of automation surrounding the use of the app from the perspective of a consumer, renders the labour of these drivers invisible. Particularly, as I will examine in the coming chapters, the additional labour that they must undertake to facilitate the existence of a convenient, cheap, fast, and hassle-free digital payment system.

The invisibility of the labour involved in facilitating digital transactions is a reminder that the experience of cashless payments is not universal. What a cashless payment means to a driver-partner and a consumer-cyborg differs. Though the app companies present themselves as neutral intermediaries, concerned with facilitating access, in practice, they exert a great deal of influence in how the mechanisms of exchange between the parties are designed and implemented. Particularly, there is a risk that the design of these payment mechanisms speaks from the “presumed center of things” (Star, 1999, p. 384), such as that of the imagined middle-class consumer-cyborg embodied by its creators, in which drivers are positioned in a role of servitude through the infrastructure of the app. In the remaining chapters of this thesis, I explore how the driver-partner and the consumer-cyborg are positioned through the app, and how this influences their exchange relationship.

4.1 Introduction

In this chapter, I explore e-money as it is rendered through the Gojek and Grab app, and their respective digital wallets GoPay and OVO. Through empirical examples illustrated by screenshots, I examine how it is visualised for consumer-cyborgs and driver-partners through the imagery of the app interface: how the digitisation of money has introduced to it the characteristic of being *cair*: liquid, fluid, and adjusting its form to any container. This characteristic allows for it to be manoeuvred through the digital infrastructure, at times even trickling beyond the anticipated channels of the app, though its flow is influenced by the parameters of the digital technology. For users, dynamically managing the flow and state of money become part of the experience of using digital payments, particularly with regards to the challenges of rematerialising it into cash form.

To begin, I explore e-money as it appears for consumer-cyborgs as both an account credit balance stored and as a payment method. I demonstrate how the app uses the visual language of the user interface to dissuade users from cash payments, by emphasising the price difference between cash and digital payment. I show how the apps have begun to increase their range of financial service for 'premium users', and through their changing interfaces draw attention to the visual transition that accompanies the shift from ride-hailing service to financial services app.

In the final sections of this chapter, I turn to e-money as it is experienced by drivers and show how their work enables the circulation of digital money, making it possible for customers to make cashless payments. I explore how the digital wallet infrastructure assigned to drivers differs from that of customers, and how part of the work of a driver-partner is to maintain liquidity across multiple forms of value, and critically, to materialise these forms of value into cash. I examine the role of drivers as exchange agents and show how drivers deploy various strategies to maximise their earnings across forms of value by utilising these integrated mechanisms of the apps. Finally,

I examine a specific case of exchange that illustrates how in prioritising the needs of consumer-cyborgs, the design of the app exposes drivers to infrastructural vulnerabilities by reducing their agency over their own digital money.

It continues to be a condition within this research that the features, aesthetics and functionality of these apps are in constant and rapid flux. Any stabilisation over the parameters of exchange they offer is temporary, as the infrastructure continues to change with each app update. Thus, the descriptions and screenshots conveyed specifically represent the way my interlocutors and I experienced these apps between March 2018 to the end of May 2019. Though I do not aim to provide a chronologically accurate account of changes experienced in the app, there are instances where a change to functionality or appearance were so dramatic that it became an important topic and experience for my interlocutors. Throughout my fieldwork, I also came to realise that experiences of the apps could not be relied upon as being consistent between users, for instance, due to A/B testing by the companies, asynchronous updates, and so on. Therefore, I do not aim to provide one 'true' and 'accurate' rendition of the app, but accept the experiences of my interlocutors, whether communicated as narratives or through screenshots as valid experiences.

4.2 Enabling Cashless Transactions

Before I describe the GoPay and OVO wallets, I want to share three short vignettes from my early fieldwork in 2018. They represent some of my earliest encounters with digital payments in the form of app-based digital wallets in Indonesia. The discourse surrounding cashless payments often emphasises how digitisation can make things more seamless and friction-free. Yet cash can be exchanged with the bare minimum of transactional appendages (hands, pockets, perhaps even wallets, or rubber bands), whereas digital money requires more infrastructural support such as QR codes or EDC terminals. Drawing attention to these many material artefacts of digital payments, Bill Maurer and Lana Swartz make the argument that much of this infrastructure is rendered invisible by design, thus allowing users to *pay without hassle*, the underlying infrastructures concealed within 'frictionless aesthetics' (Maurer and Swartz, 2017)

Arguably, it is the ease of making such digital payments that is part of their rapid uptake and why it is considered acceptable that these companies are allowed such intimate access into our financial lives. The visual seamlessness obscures the value and importance of the informational traces we leave behind. Yet it also seems an acceptable trade-off for what we receive in exchange. As Maurer and Swartz point out, it is also these 'frictionless aesthetics' that cultivate 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 these exchanges when money is a numerical record in a remote, inaccessible database? In the following vignettes, I introduce three separate encounters with infrastructure meant to enable the transaction of money without cash. All three brought my attention to the infrastructural challenges of the emerging digital economy in Indonesia.

NFC STICKERS

In March 2018, as I was preparing to pay for some groceries in a small shop, I noticed a ‘T-Cash’ sticker on the cash register. Excited, having just installed the T-Cash app and accompanying near field communication (NFC) sticker for my phone,²² I asked the cashier if I might use it to pay for my groceries. “*Belum bisa*” she said, smiling apologetically: cannot yet. The phrase lingered with me. The sticker had been placed there by someone implying that it was a payment option, so why *not yet*? Perhaps they were still waiting for the technological infrastructure to receive NFC transactions which the T-Cash app relied upon. Perhaps it was a franchise policy of the shop chain yet to be implemented in this particular branch. Perhaps the technology was there, placed by an overzealous manager, but this cashier had yet to receive the necessary training to make the transaction possible. Maybe it was she who *could not yet* understand the process. Perhaps someone just thought the colourful sticker would be decorative? Perhaps it was aspirational, the possibility of cashless payments intended to communicate modernity and efficiency in a store that only currently accepted cash or conventional debit cards.

It is not uncommon in Indonesia, to be told *belum*: not yet rather than no. It is a polite way to decline. Rather than dismiss outright by using the word *tidak*, it leaves the door open for opportunity and gives the recipient of *belum* a margin to manoeuvre. It is part of a cultural behaviour in which engaging politely with other people means avoiding angering them or disturbing their equanimity. Therefore, *not yet* does not mean that it is going to happen, and it also conveys an aspirational quality in the margins of possibility that perhaps one day it may indeed be achievable. There is an optimistic sense in that this future is pending, that there is an intention that this condition will change: one day, it may be possible to use that NFC sticker.

DRIVERS

“*Belum bisa*” a barista also told me a few months later when I asked if I could pay for my order with GoPay. It was early June and I had recently returned to Yogyakarta to begin my fieldwork. I had downloaded the Gojek app containing the digital wallet GoPay, with which I was now trying

²² The T-Cash NFC sticker is registered to my T-Cash digital wallet app and contains a readable chip. The sticker is mounted to the back of the phone and can then be used by ‘tapping’ an NFC reader, which will then recognise and charge your T-Cash account.

to pay for my coffee. I had selected this coffee shop from my neighbourhood because I had seen it listed in the GoFood section of the Gojek app, and so had assumed the digital wallet would be an acceptable form of payment. The coffee shop only accepted cash, the barista explained, but if I wanted to use GoPay there was a way of doing so. I could make an order for my coffee using the GoFood tab in the Gojek app and select the digital payment option rather than cash payment upon checkout. A Gojek driver would receive the order, drive to the café, and buy it for me using cash. The driver would then bring me the coffee and be paid for both the coffee and their time using my GoPay balance. This was my first encounter with the entanglements of online drivers and digital money in Indonesia, and my first confounding experience of the peculiar limitations and opportunities of transactions that had materialised from the app's interface.

QR CODES

A few weeks later I had my first successful experience using the wallet to make a payment without involving a driver. Dangling from the counter at a Gramedia bookstore, I noticed a small circular paper sign. The sign read:

Bayar tanpa repot. Pay without hassle.

Kumpulin GoPoints. Accumulate GoPoints.

Bayar menggunakan GoPay. Pay using GoPay.

"*Bisa!*" the clerks at the counter exclaimed when I asked if I could pay using GoPay: *you can!* Making the payment proved less straightforward than their enthusiasm implied. It involved the use of a conventional payment terminal, which with some cajoling finally printed a QR code I could then scan using my smartphone and GoPay wallet. Finally, the app flashed a notification screen telling me that the payment had been successful, we all looked at each other expectantly as nothing happened. The clerks asked me to check my phone again. Just as I started to feel the adrenaline rush of having possibly lost my money, one of the clerks started clicking through the limited menu options on the payment terminal, and suddenly the cash register printed a receipt for my purchase. I was surprised by the many forms of technology required to facilitate this cashless transaction. It did not strike me as more convenient or hassle-free than a cash payment, which leaves the second argument on the paper sign: that the main benefit of a digital wallet was to collect points by conducting my purchases through the app, which would later be cashed out in the app for promotional offers, *promos*.

Neither of these examples could be described as frictionless or hassle-free. They made it clear the importance not just of the infrastructural machinery but the people who were connected to the

payment infrastructure. There was a missing link somewhere at the first grocery store. It was the persistence and experimentation of the bookshop clerks that allowed me to use my phone to pay. In the example of the barista, it was the driver who enabled my transaction to be cashless by using his own cash to make the payment. Finally, the emphasis on earning 'points' through digital transactions encourages users to direct more payments through the digital infrastructure, leaving behind extensive data records of their transaction history from which the companies can then benefit.

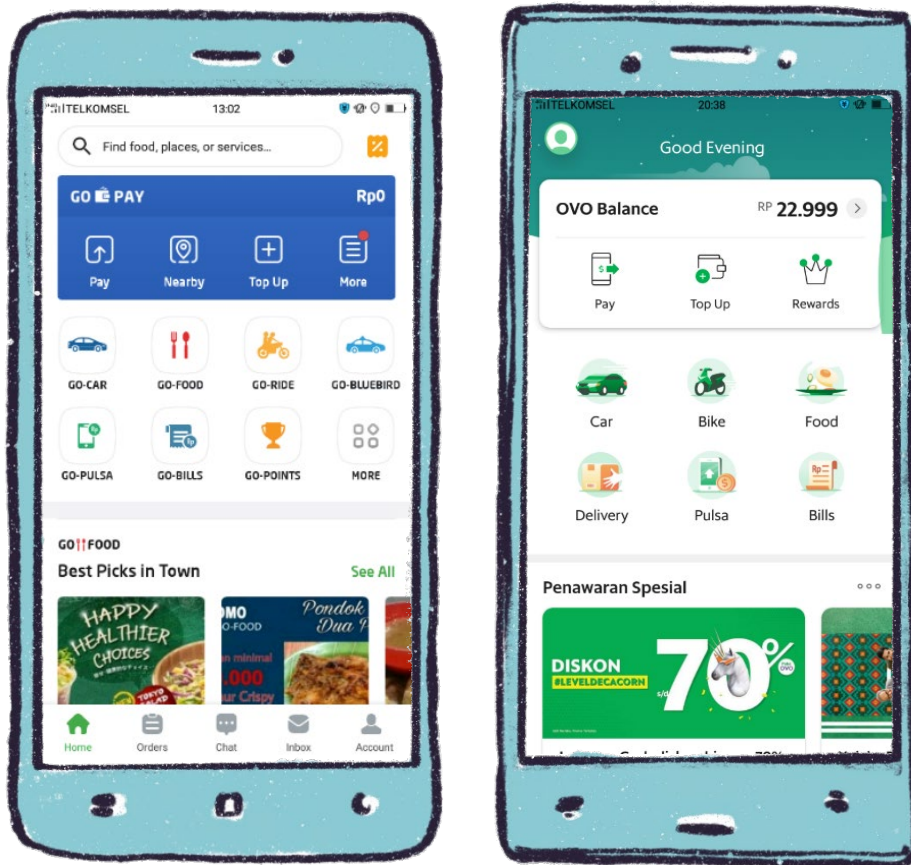
By the time I returned to Indonesia for the second round of fieldwork in February of 2019, I found that things had changed dramatically. Visiting a mall in Jakarta on the first day after arriving, I was struck first by how much the visual landscape itself had changed. When discovering the round paper sign in 2018 had felt like a stroke of luck, the counters in the mall were now dominated with QR codes and advertisements for various digital payment options. I was accompanied on this trip by a friend who, upon seeing my surprise, remarked that the payment apps were like *burung kecil*: little birds. She meant that they were everywhere; perched on shop counters or fluttering as app icons on our phone home screens. These payment technologies, their infrastructures and their app interfaces are in continual development. As the apps become more ubiquitous and their use increasingly 'simple' and 'friction-free', their increasing uptake requires careful examination of what it is that we transact besides money when we use them, and how they encourage or discourage certain transactional behaviours and economic relationships.



Illustration 2: Driver waits for a food order to be prepared for pick-up

Maintaining Your Saldo

To examine the dynamics of transactions taking place through these apps, let us first explore what the customer sees when engaging with it and specifically how the e-money itself appears. As a customer, the home screen that greets you upon opening either the Gojek or Grab app look very similar seen in Screenshot 4. At the top is a designated wallet area, below which is the menu of services available in the app. A scrollable 'feed' contains special offers, suggested trips based on your past orders, and in the case of Grab, occasionally in-app games to play while waiting for a driver, or your horoscope, or a timer for calls to prayer during Ramadan, or updates from the World Cup in football. In both apps, the balance held in the app is marked in the top right corner.



Screenshot 4: Left, Gojek homescreen. Right, Grab homescreen.
25 April 2019 and 17 March 2019 respectively.

In the Gojek app, the wallet menu is marked in dark blue, showing a familiar 'wallet' pictogram in the GoPay logo and your balance in Indonesian Rupiah (Rp) on the right-hand side, known as the *saldo*. The OVO wallet menu appears in muted green tones, aesthetically matching the general appearance of the Grab app, rather than using the bold purple colours of the separate OVO wallet. Again, in the top-right corner of the wallet menu, it is possible to see immediately the OVO credit

balance, denominated in Rp. In both apps, the wallet menu includes tappable icons for making payments and topping-up, as well as additional features. Both apps cap the balance amount you can store at Rp 2,000,000.

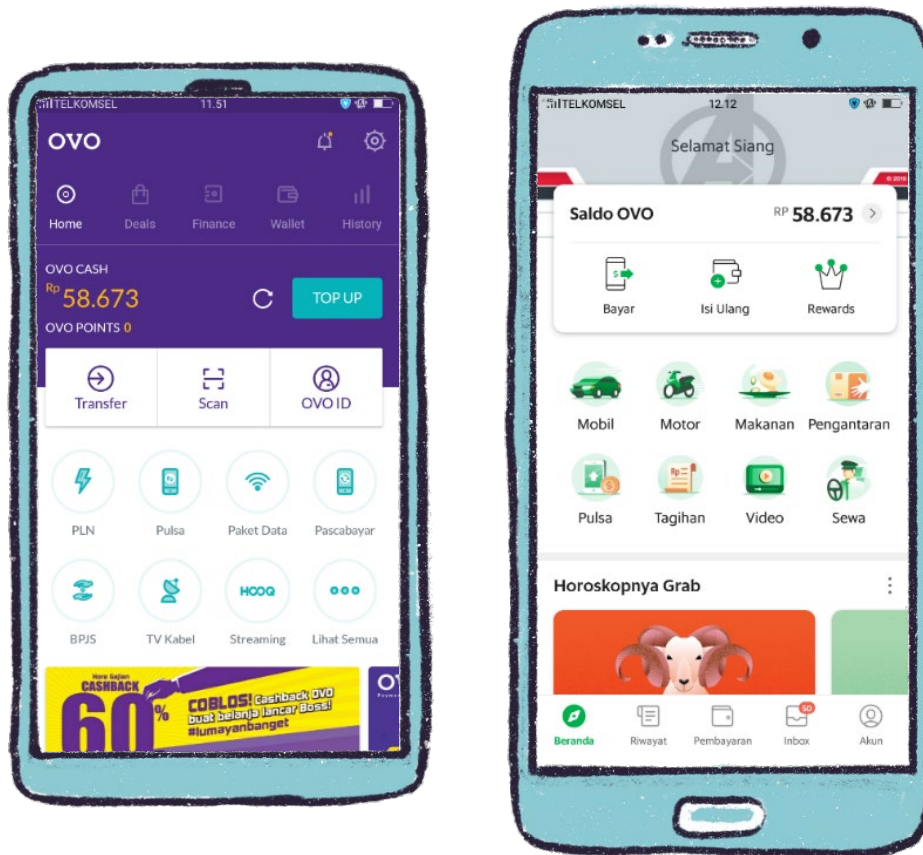
Although the wallet menu in both apps feels relatively dominating, I seldom interacted with it in practice. My interactions with the wallet only really occurred when selecting a payment option before completing driver bookings through the app. Nevertheless, I found that the presence of a designated 'wallet' in the app, as well as the familiar-looking 'wallet' pictograms, were reassuring and added a substantive quality to the numerical representation of my credit balance. This skeuomorphism, this emulation of a familiar reality through ornamental clues in the interface design of a digital payment app, is not unique to GoPay and OVO. For example, the Danish MobilePay app graphically 'prints' an animated receipt upon completing a transaction.²³ There is no practical reason that the transaction confirmation should come in this imitation, but it feels familiar and gives the exchange the same finality and trust learnt and associated with conventional payments.

Both OVO and GoPay operate in a context where digital payments are still relatively uncommon. The emulation of a familiar reality makes the credit balance feel less ephemeral, less simulated, and more recognisable to the usual form of money you might otherwise carry with you. It obscures the fact that this credit balance is a mere reflection of a number, stored in a database far outside of your control and only existing for as long as the company and app continue to operate. As a credit holder, you have to trust that this credit balance continues to be valid tomorrow. In other words, for users of the apps, the intermediating infrastructures that allow transactions to take place are not immediately visible, as Brett Scott writes, "the intermediation often happens so fast that it is not consciously noticed, taking the form of a mysterious background process that works just 'like magic'" (Scott, 2019). It disguises the underlying communication politics of these app ecosystems and the control that these companies exert over the conditions of participation in their respective transactional communities.

An excellent example of this frictionless design is the integration of the OVO wallet into the Grab interface while also operating as a separate wallet app. In Screenshot 5, it is possible to see the same saldo displayed across the home screens of both apps. The separate wallet app can be used to make payments in shops or at restaurants by using the 'scan' function to pay through QR codes, something you can also do through the Grab app, using the 'pay' feature in the OVO wallet menu.

²³ An example from 2018 can be viewed here:
https://www.youtube.com/watch?v=tKpyeUvnWLQ&ab_channel=MobilePay

Both apps enable you to use your OVO balance for a range of additional services, such as paying for pulsa or for utility bills, some of which require you to upgrade your account.



Screenshot 5: Left, OVO app. Right, the same account balance appears in the Grab app. 25 April 2019.

During one fieldwork encounter in April 2019, a Grab driver asked me if I would like to receive a 'top-up' of my digital balance. This was not unusual because drivers are enrolled as exchange agents for the app, allowing customers to swap their cash for digital balance. I was surprised in this instance because in my version of the app it appeared as though he was not eligible for making such a transaction. He explained to me that for reasons that were not clear to him, only some drivers were eligible to exchange cash. Having reached out to Grab to be confirmed as an exchange driver, he had been told he was not eligible to sell OVO, because he had already used his number earlier when registering as an OVO customer in the app. Neither he nor I could explain why this would be the case, perhaps it was simply a bug in the system.

Unperturbed, he had invented his own top-up method "*Diluar sistem Grab*": outside the Grab system. This was not a problem he explained, because now with all these apps money can be *cair*. *Cair* is the characteristic of being liquid, fluid, to be released from solid form. Like water, its form adjusts to its container. For this driver, money was now *cair* because you no longer had to

physically go to an ATM or bank to materialise the money in the form of cash.

Pulled over at my destination he pulled out a second smartphone and opened his separate OVO app, of which he was a 'premium user', allowing him to send money to others. In the OVO app on my own phone, he navigated to a screen that offered three different ways to receive money: a barcode, a QR code, and using my phone number. We tried the QR and barcode multiple times with various levels of screen brightness without success, before finally trying the phone number. The trip had cost me Rp 17,000, and he suggested we make the top-up an even Rp 100,000 to avoid change, meaning I would pay him with a Rp 100,000 note, and receive Rp 83,000 as a top-up in my OVO account. Shortly after, he showed me that his own OVO account had been debited, and the new balance appeared in both my OVO and Grab app. I passed him the note, thanked him for his effort and stepped out into the evening rain whilst he reminded me to give him a five-star rating.

The *cair* quality of digital money makes it malleable, allowing this driver to deftly manoeuvre it through various forms. Even to the point of ending the day with a crisp Rp 100,000 note without having to go to an ATM to extract his earnings. If the app prevented him from operating as an exchange agent, he still found a way to provide high-level customer service. The exchange 'outside the Grab system' would still benefit him within the rating algorithms that govern that same system if I gave him the five stars. It also introduced to his customers the value of upgrading their accounts to being 'premium users'. Finally, the moment also serves as a reminder that these roles of being either the service user or service provider are not so neatly binary: many drivers are also customers of the apps themselves.

Upgrading Your Account

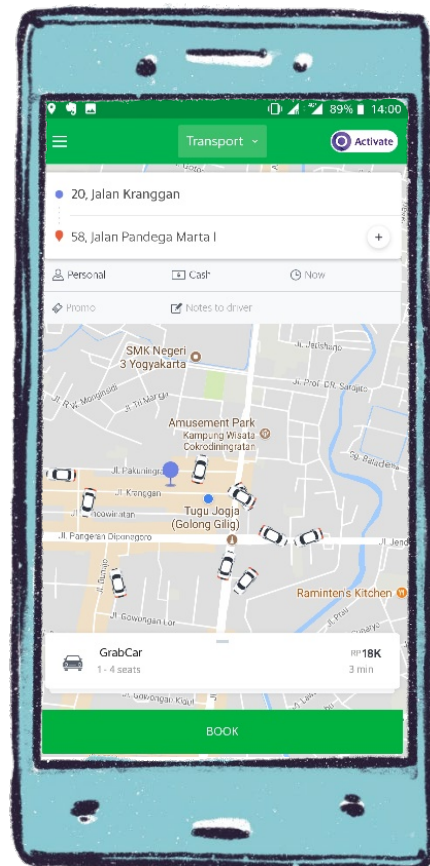
At the time of writing, there is still no separate GoPay wallet. You also cannot 'open' the GoPay wallet by tapping on it, instead, there is the option to select the 'More' icon in the menu to see additional features such as making payment requests, withdrawing your balance, or paying for utility bills and *pulsa*, phone credits. What is not immediately clear is that most of these features only become available once upgrading your GoPay account, encouraged to do so by the image above the feature icons. Upgrading your account means providing the app with details and a photograph of your formal ID and allows you to store much more money in the digital wallet and to withdraw or transfer your balance to other account holders as with OVO's 'premium users'. More recently, this upgrade is referred to as being 'GoPay Plus'. It now also includes a form of insurance for a lost balance as well as access to what is called 'PayLater' benefits that I described in chapter 2 and 3, allowing users to delay payment and make purchases in instalments (Gojek,

2020b).

There is a clear boundary established here between those who use the app for smaller daily transactions and those who use it more broadly as a financial service. In the first version of the app, the flow of money is unidirectional so that GoPay issued credit only exits the app environment through purchases. The second version is for those who can afford to store larger sums in the form of GoPay credit and who want to be able to transition flexibly between accounts. Providing the types of features that come with a GoPay Plus account also marks a transition from Gojek being solely a transport app that has an integrated payment mechanism, to one that is a financial services app with affiliated services such as transport.

In practice, the requirement to submit proof of identity to access these financial services is what the financial industry refers to as ‘Know Your Customer’ or KYC. KYC regulations or guidelines require companies to perform due diligence and verify the identity of their customers to safeguard against illicit activities. The Indonesian regulatory changes in 2017 reflect the changing landscape of actors within the payments industry where fintech companies increasingly dominate. For regulators, the challenge was to determine “how to treat the use of an electronic currency on a mobile device” (Maurer, 2012, p. 20). The issue at stake for both parties was when something should be considered money, and how regulators would know the amount of money that is in circulation. These new actors within the industry walk a delicate line between their customers and the regulators, though as I pointed out in chapter 2, they are not without influence in the legislative agenda.

I would argue that these changes are also evidence of how the apps are reorienting themselves towards more profitable business models. Where transactional metadata, or at least the expected value from this data, is a more prominent potential revenue source than the cuts or fees taken on microtransactions. Looking back at the way the interfaces of these apps have changed, even between 2018 and 2019 when my fieldwork took place, it is easy to see how both Grab and Gojek shifted their focus. In Screenshot 6, you see one of the first bookings I tried to make with the Grab app. At the time, the app opened onto a map and immediately directed you towards making a transport or delivery booking. The OVO



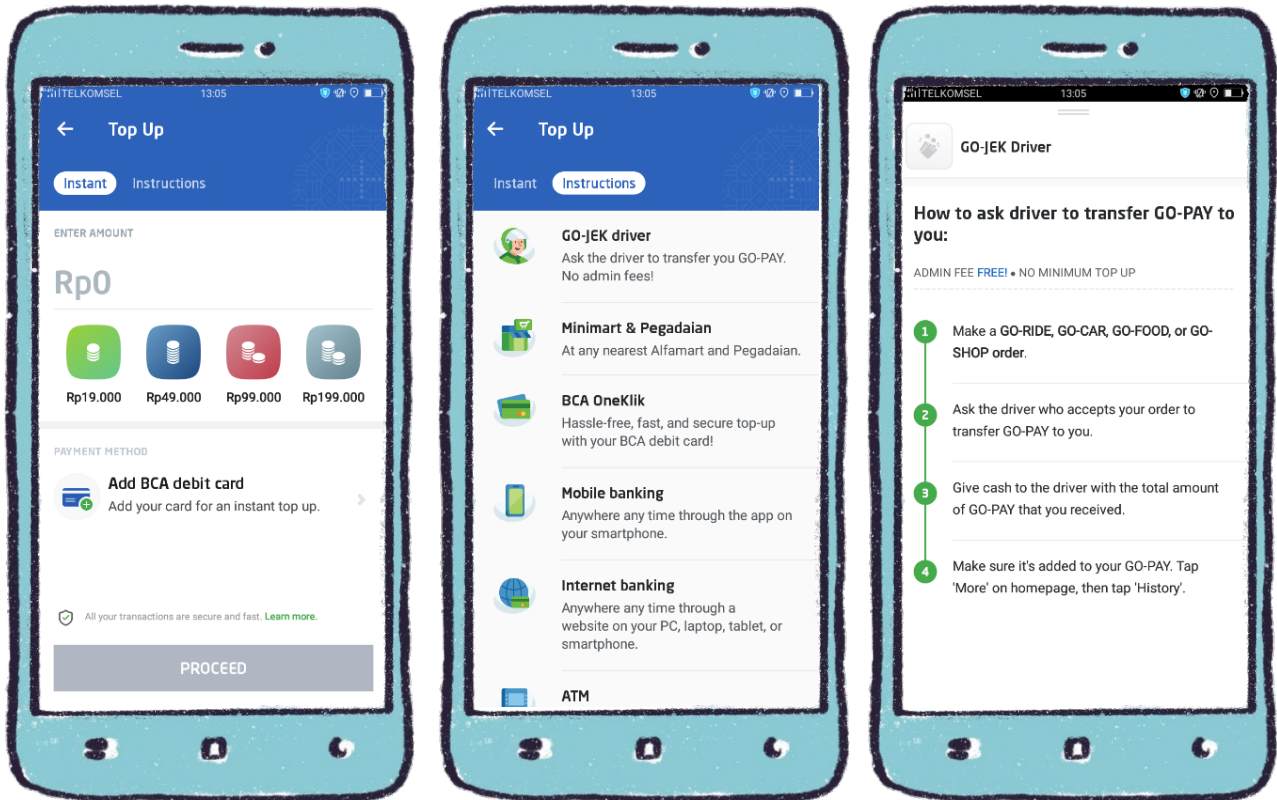
Screenshot 6: Booking with Grab.
12 June 2018.

wallet was only visible as a small purple 'O' in the corner, with the option to activate it as a payment method. A 'promo' field is visible, but it appears grey and in the background. This is a transport service app with the additional option of using digital payment. Compare that to the more recent screenshots shown earlier that centre around the digital wallet and, as I will show shortly, nudge the user towards always making the 'choice' to make the payment digitally.

Like GoPay, OVO also allows people to upgrade their accounts and become 'Premium Users'. However, each app imposes a limitation so that you can only connect your formal ID to an account once in each app. This makes sense in terms of the KYC requirements, but it does raise other questions. For one, setting up a user account is very simple. You download the app, register a phone number or email address, and set up your account. No ID is required, and you can always make a new account if you need to. But what would happen if you should somehow lose access to your account and need to start again, having already used your ID in a context where you may have come to depend upon the services these apps provide? Secondly, where transaction and travel history made on a throw-away account feel inconsequential, connecting your government-issued ID to your transaction history is another matter entirely. These companies already have access to detailed data points about someone's spending habits and creditworthiness, but now these informational traces are attached to a more permanent record, tied to your formal personal identity. As described by Keith Hart (2007) this money becomes 'hyper-personalised'. As these apps extend the ecosystem of their financial services, this information can be used to assess creditworthiness and to implement more targeted advertising and promotional offers. As some users gain access to additional services, new forms of credit and opportunities for manoeuvring money forms, this design can also contribute to further digital hierarchisation as premium users gain access to more transactional privileges.

Topping-Up Your Balance

Let us turn our attention back to the formal method for 'topping-up' within the app ecosystems. As discussed earlier, the concept of topping-up or *isi ulang* is familiar within the Indonesian context. Topping-up your digital balance refers to the process of exchanging other forms of money, either as cash or bank transfer, into e-money that is stored as a credit balance called *saldo*. You top-up your balance when your *saldo* is getting depleted. As can be seen in Screenshot 7 there are several ways to do so.



Screenshot 7: Topping-up with GoPay.
25 April 2019.

These interfaces are what appear when you tap the 'Top-up' icon in the GoPay wallet menu in the home screen. The first screen shows you how to make an instant top-up by making a debit card payment. The Grab app has a very similar screen, the main difference being that GoPay only accepts a debit card from the commercial Bank Central Asia (BCA), whereas Grab allows foreign debit cards issued by Visa or Mastercard. Importantly, in both cases, this transaction is referred to as a payment, only noticeable as a subtle detail in the GoPay interface. It appears as a faded grey heading text that asks you to select a "Payment Method" before adding a BCA debit card. When you 'top-up', you are making a purchase and the purchase is for GoPay or OVO issued saldo. In other words, though the money stored in my GoPay account is denominated in Indonesian rupiah, in practice it operates as a form of private credit or money token. Issued and stored by GoPay and valid only as payment for GoPay services. The distinction between *cash rupiah* and *GoPay rupiah* may seem semantic, but the paradigm shift is noticeable even in the subtle ways that people speak about forms of digital money. In the screenshots above, GoPay is referred to as though it is its own currency, for example, "How to ask a driver to transfer GoPay to you." Similarly, I noticed that interlocutors frequently referred to the money stored in their OVO account simply as 'my OVO', reproducing the language wherein it is its own currency rather than a value defined in Indonesian rupiah. In practice, unless you have upgraded your account, cash has been converted into GoPay

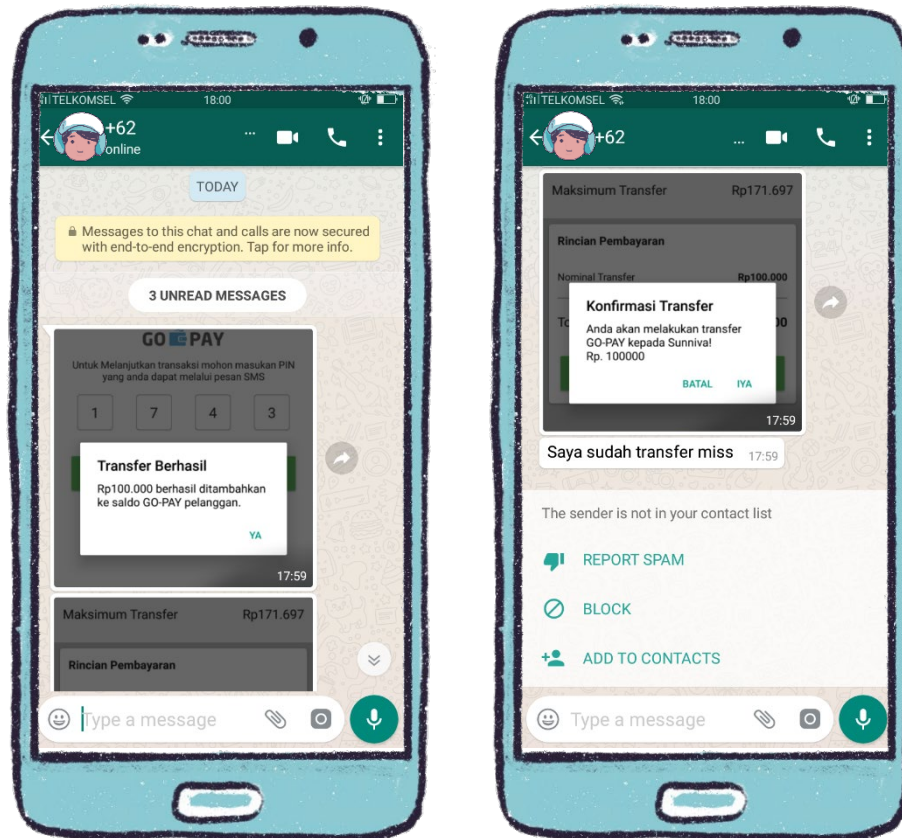
it becomes sequestered within the app's ecosystem and can only exit in the form of payment to any of the affiliated merchants.

The 'instant' top-up method allows a user to easily maintain digital liquidity by continuously refilling the digital wallet. As most people in Indonesia do not have debit or credit cards the app offers various other options for topping-up. The first of two options are in the category of cash exchange agent comprising the fleet of Gojek drivers, the chain of Alfamart minimarket stores, and the pawnshop chain Pegadaian. For non-cash transactions, it is also possible to use mobile and internet banking, as well as ATMs to transfer money from a bank account. For each category, the app provides extensive and very thorough guidance on exactly how to conduct the top-up, including such details as which codes to enter when at an ATM to transfer money from your bank account to Gojek. It is also worth noting that except for drivers, all top-ups incur a fixed transaction fee, which ranges from Rp 1,000 to Rp 7,500. Notably, the option to top-up through a driver includes "No admin fees!"

For this thesis, my focus is on the role of the driver as an exchange agent. According to the app instructions for a driver top-up, making a booking with a driver allows you to make a top-up request. The app says, "Ask the driver who accepts your order to transfer GoPay to you. Give cash to the driver with the total amount of GoPay that you received". No interface in the customer app facilitates this transaction. Instead, you simply communicate with the driver, either face-to-face or through the integrated messaging system before your driver arrives. An important detail here is that the driver transfers to the customer from their own account balance. They are effectively selling their balance to you without any transaction fee. Thus, upon receiving the top-up, the customer is paying the driver back the equivalent value in cash.

These top-ups are usually negotiated between driver and customer, sometimes at the behest of the customer or because the driver offers the service, thus making their balance available to the customer. In Screenshot 8, you can see a top-up exchange between myself and a Gojek driver. Before physically meeting, the driver messaged me through the integrated messaging system to ask if I would like to receive a top-up. As a general policy, I would always say yes to such requests, but in this instance, I responded that I only had a Rp 100,000 note. It is worth noting that Rp 100,000 would constitute a significant portion of a Gojek motorcycle drivers' daily earnings, which in my experience meant that they would seldom have sufficient available balance for such a large transfer. Expecting him to decline, I was surprised to next receive a WhatsApp message from an unknown number. It was the driver, sending me screenshot images from his side of the app, confirming that he had sent me the Rp 100,000 before I received any notification from the app itself. "I already transferred miss," he wrote, and I had to scramble to see if I did have enough cash

to pay him back - there was no way for me to pay him digitally otherwise. The driver was using screenshots as a means of confirming the transaction through a secondary app, almost as though he were sending me a receipt: a guarantee outside of the app environment that I now owed him Rp 100,000.



Screenshot 8: Top-up confirmation in a WhatsApp chat from a driver. 10 July 2018.

Throughout my fieldwork, I encountered several examples of drivers engaging in activities that would help to generate trust. For instance, I noticed that drivers would use the English phrase top-up, rather than *isi ulang* or *isi saldo*, meaning ‘refill saldo’. During an interview with a Gojek driver, I asked about the prominence of English words in the daily vernacular of online drivers, such as ‘driver’ instead of *pengemudi* or *supir*, ‘cancel’ instead of *membatalkan*. He answered:

A: I don’t know. For me the language is more simple, actually. My understanding is this, if we use it a little bit, people will trust more.

Q: People will trust more?

A: Well, kind of like, not the application, but personally.

[Interlocutor 3]

The original turn of phrase in Bahasa Indonesia, *sedikit menggunakan* meaning ‘to use a little bit’, is also an understated, gentle, and perhaps slightly humble articulation. As a non-English speaker,

he points out that adopting the foreign language elements of the application also associates himself with what the app represents. Importantly, it is not about generating trust between the customer and the technology of the app, but between the two parties that are engaging in the transaction. For the drivers, maintaining a good relationship with the customer is critical, as they are working under the on-demand labour conditions of the gig economy, as I will describe in more detail in the next chapter. Thus, relational work becomes a dominating element of the on-demand labour of driver-partners (Zelizer, 2012).

I do briefly want to touch on the fact that the driver in the previous example was able to contact me through a third-party app, namely WhatsApp. Once you are connected through a booking, either driver or customer can phone the other by clicking a phone icon in the integrated messaging system. This is frequently used by drivers engaging in relational work to check in with customers about a booking. In this case, the driver was picking up a food order for me and had called to check that the order I had placed in the app was accurate before he placed the order manually, as drivers spend their own cash money up-front to pay for the order and do not want to risk any mistakes. In doing so, my number now appeared in his call history, allowing him to message me through WhatsApp. It is not my intent to engage in a deeper discussion about data protection here, but this is a significant security problem and a stark reminder to engage critically with how these apps access and share various forms of transactional metadata.

Selecting Payment Method

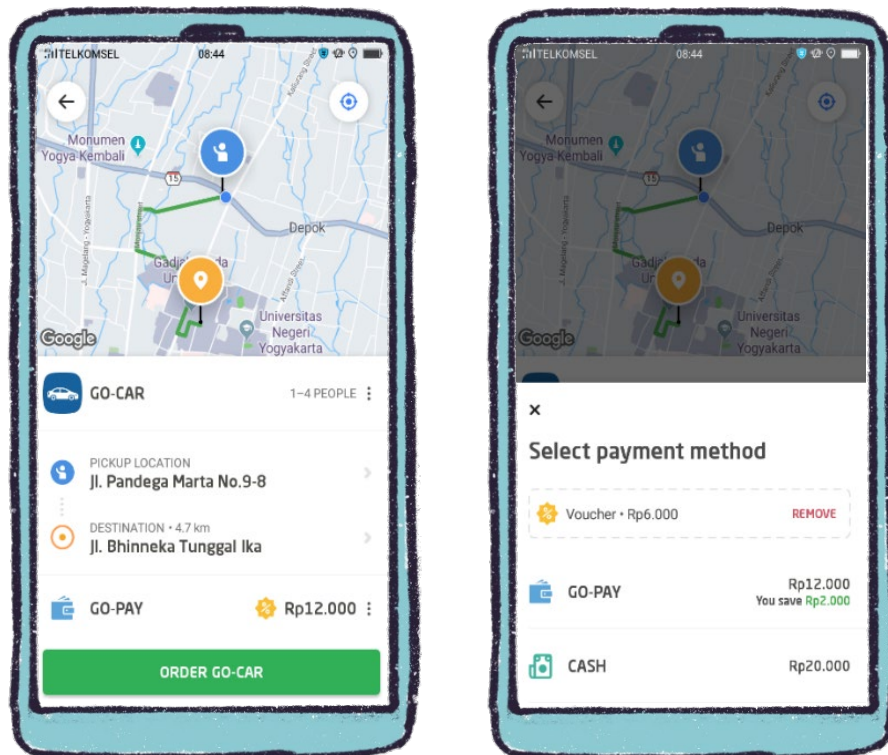
In this section, I will focus on money as payment within these apps, which is the main way that you engage with the balance of the digital wallet. I focus on payments for bookings made through the app engaging drivers rather than payments using QR codes at shops or restaurants. As a customer, you first input your journey or delivery order using the app navigation, and the app then suggests a route and price which is based on a set tariff per kilometre.²⁴ Depending on the location and time of day, this price may also be affected by surge costs as demand for the service rises. Before confirming the booking, the app then provides you with the opportunity to select your payment method. There are only two: cash or using the integrated digital wallet. While it is possible to connect a payment card to your Grab or Gojek account, you can only use it to top-up your credit balance not to make payments. In Screenshot 9, you can see the way the payment option appears in the Gojek app.

In this example, I booked a trip that cost me Rp 12,000 and since I had this amount in my GoPay

²⁴ I will examine the impact of these mechanisms on the drivers themselves in chapter 5.

balance, the app automatically selects GoPay as the payment option. Tapping the wallet logo opens a menu allowing you to change the payment method, but it also shows you how the cost of the trip will change based on how you pay.

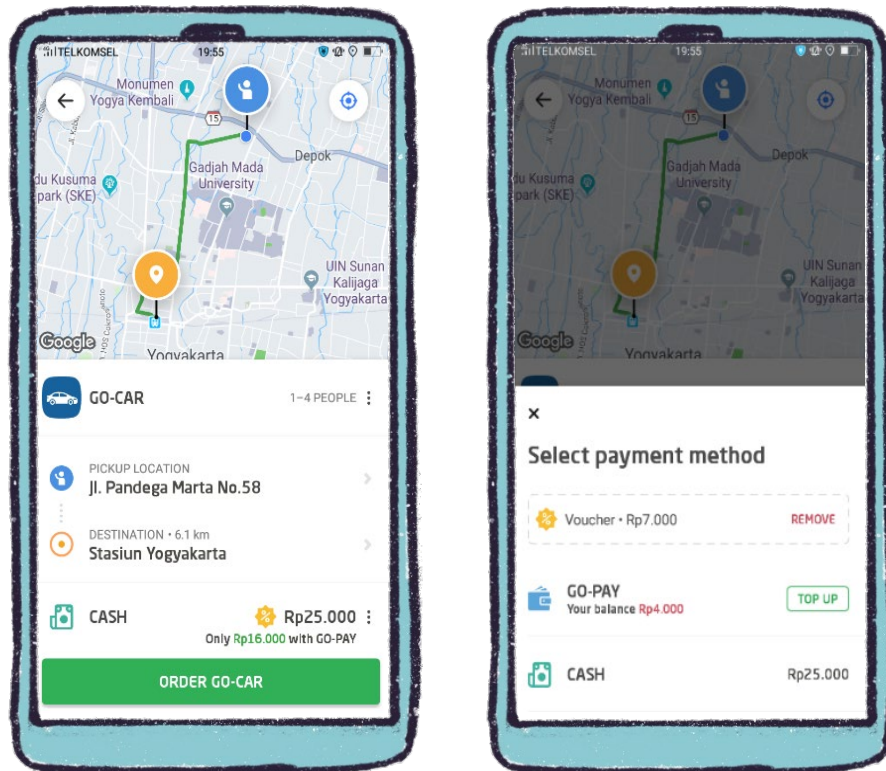
First, the cost of my trip has been reduced, with green text the app notifies me that I am 'saving' Rp 2,000 by choosing to pay with GoPay. Below is the option to pay with cash, costing nearly double what my GoPay fare would be, making me wonder what the GoPay 'saving' is supposed to be relating to. Second, the app has also automatically included a 'voucher' worth Rp 6,000, which could account for the difference in cost between the cash and digital option. It is not immediately transparent from this interface how these values are calculated, but the dominant overall visual effect makes the cash payment option feel significantly more expensive.



*Screenshot 9: Selecting GoPay as payment method with Gojek.
March 2019.*

From my first encounters with these apps, the digital payment option had always been cheaper for the customer. In 2018, Gojek would simply reduce the cost of the trip by 20 per cent for GoPay, and Grab would offer between 10-20 per cent discounts for trips paid with OVO. Initially, I was concerned that this cut was taken from the driver, a concern many of my non-driver interlocutors shared. In reality, the company and the driver split the income of each trip 80/20, meaning that drivers always only get 80 per cent of the cost of the trip. The only difference is that when that full payment is made in cash, the driver now 'owes' the company their 20 per cent 'cut' of the money.

Later in this chapter, I will explain in more detail later how this works in practice but suffice to say that in the event of digital payment, the discount that the customer receives is roughly equivalent to the company forgoing their share of the income from the trip. The additional reduction in the form of the voucher was a new innovation that I first encountered in 2019, and it saw the digital price reduce drastically.

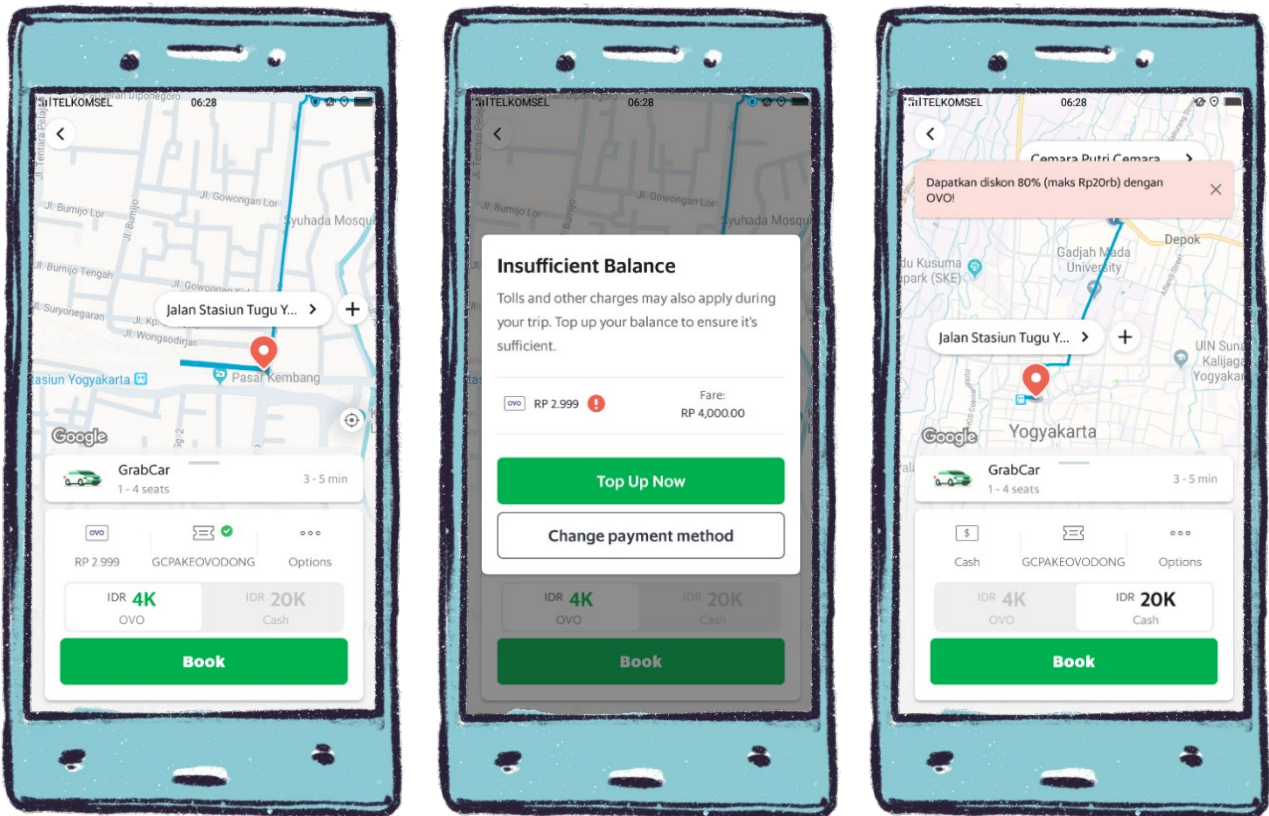


*Screenshot 10: Selecting cash as payment method with Gojek.
14 March 2019.*

The following day, I was making a longer journey and found that I had not topped up my account. As can be seen in Screenshot 10, this meant that the app automatically selected the cash payment option, while also reminding me that the trip would be two-thirds of the price if I switched to GoPay. However, tapping the menu to change the payment method, the screen informed me that I would need to top-up my account first because my balance, marked in red text, was insufficient to pay for the trip. Unable to top-up with a debit card, the emphasis on the price difference now made me feel as though I had wasted money. Once again, a ‘voucher’ had been added to the trip, though its exact impact on the price remained unclear.

Turning to the Grab app, the basic mechanism is similar as can be seen in Screenshot 11. After you complete your booking details, you come to a confirmation screen where you have the option of selecting a payment method. Here is a key difference: when you use the Gojek app, the booking feels complete by the time you get to the confirmation button and the price is listed below your

order details even though the price can change if you choose to tap the payment option. To make such a change feels like an additional step. In the Grab interface, the payment option is much more prominently connected to the order booking, and there is a central difference here in how the payment option is introduced.



Screenshot 11: Selecting payment method with Grab.
15 March 2019.

In Grab, the “Book” button is included in a little ‘box’ at the bottom of the map screen containing several details relating to the cost and payment options. Prominently featured is a form of sliding bar where two different prices are visible. To the left, in bold green font is the price of the trip if you make the payment with OVO. Tapping the right portion of the bar changes your payment to cash, where the price is displayed in a neutral black font. Just Rp 1,000 short of having a sufficient credit balance in my OVO account for the OVO price, I was forced to make the booking with a much higher cash payment. The reason that this Grab ride was so much cheaper with OVO than with cash was that the app had automatically added a ‘voucher’ to my booking. This you can see is activated in the first image: a pictogram voucher with a little green checkmark which is deactivated in the final image when I select cash payment. The ‘voucher’ is called “GCPAKEOVODONG”, *pake OVO dong*, an informal and persuading turn of phrase encouraging people to ‘just use OVO’. Not only does the app prominently display the price difference on the

slider bar, but when you select cash payment, a new red notification bar appears at the top of the screen reminding you that you would get an 80 per cent discount if you used OVO instead of cash. I did not need the additional reminder because, after multiple situations where I was missing out on these extreme discounts, I was already starting to feel anxious and a little bitter each time I forgot to top-up my OVO account.

Thus, the presence of the digital payment option is not just presented as a convenient or neutral alternative to making a cash payment. The interfaces of both apps aggressively encourage users to pay digitally to the point one almost feels punished for choosing cash. This affects how people use the apps and by 2019 almost all bookings I made would begin by opening both apps to see which was offering the best discounts and vouchers that day. I found myself taking every opportunity to ensure that my accounts were topped up to avoid feeling as though I was missing out on a cheaper trip. I would later understand that at this moment in time, Grab, Gojek, OVO and GoPay were engaged in a brutal price war to attract customers by spending a lot of money on discounts, vouchers, and cashbacks (cf. Syahputera, 2019; Tani, 2019). The effect on me as a customer of the apps was that selecting payment methods felt less like a choice because the way that the apps presented the cash option always made cash payment feel both expensive and wasteful. In maintaining digital flexibility across both platforms, this behaviour came to be associated with a feeling of urgency and each 'choice' to pay with cash felt foolish.



Figure 12: Apps compete for customers with varying cashbacks at the same restaurant.

This also means that access to cashbacks, discounts and promos is an important motivation for users of digital payment apps and interlocutors frequently pointed out that paying with a digital wallet is usually cheaper than using cash. In an interview with a Gojek user, I asked whether she would generally choose cash or digital payment upon check out:

A: I would use GoPay.

Q: Usually GoPay?

A: Yeah, it's cheaper.

[Interlocutor 4]

Later in the interview, she shared with me that she never stored more than Rp 100-200,000 in the digital wallet, preferring not to keep more money there than necessary. As she pointed out, it was easy to refill as required but having enough of a balance meant being reliably able to use the digital payment service. Asking her why she preferred to use the digital service, she responded:

What I like, I like to receive the promo's, which also makes it cheaper.

[Interlocutor 4]

Like myself, she too would check whether Gojek or Grab was cheaper each day, using the available promotions and vouchers to make her decision about which app to use. Across my interviews with users of these apps, there was a similar emphasis on the fact that digital payments make things cheaper, and even marginal gains would affect people's choice of payment. Confirming this is in an interview with an industry representative who described that when testing their app, they found that people would change behaviour when they adjusted prices with as 'little' as Rp 1,000. Each of these companies is operating its own private credit token, it is, therefore, necessary for users to maintain balances across multiple apps and have easy access to topping-up services to make the most of the available discounts. However, as I discussed in chapter 2, though access to smartphones is increasing in Indonesia they are of varying quality, and as many interlocutors pointed out, not everyone has space for multiple payment apps let alone money to maintain multiple balances. In practice, those that are already able to afford the higher quality mobile devices and who have enough liquidity to maintain multiple balances are best positioned to take full advantage of this new digital economy.

Thus, for most users of these apps, the real value proposition of e-money is not the fact that it is digital. It is the ability of this form of digital money to provide access to cheaper services and products. Reminiscent of the women describing plastic cards as convenient, not because of their functionality, but because of the wealth their use implied. The wallets are a gateway to discounts or 'agroupon', as one industry representative described them. They are only cheaper in that the companies choose to both create and emphasise the price difference between cash and digital

payment. For many interlocutors, these are services that they would be using anyway, but for others, the apps also provide access to more luxurious goods and services. The logic here is that the value of your money, when used in GoPay or OVO form, is greater in terms of what it can allow you to purchase than the same amount of money cashed out as rupiah. While the companies lean into the narrative of financial inclusion and argue that these digital payment apps will lead to improved living conditions by giving people access to the digital economy, it seems that what the apps primarily give is an access point for the type of purchases that are associated with a middle-class life.

One afternoon in Jogja, I encountered a strong counter-narrative of apps making things more affordable. Asked how he felt things had changed with the introduction of digital payments, an older online driver complained to me that it was becoming too expensive for his customers to use cash because of the *biaya*, or fees, on cash payments. While there are no direct fees yet for paying with cash, there is of course an indirect penalty for cash users who miss out on the digital vouchers and discounts. As shown above, the app interfaces themselves heavily reinforce this impression of being penalised: the use of red and green to signal positive or negative actions, the notifications about missed opportunities, and the emphasis on price difference all serve to remind the user of the cost of using cash. As the driver pointed out, not all customers have the resources to participate and maintain digital credit balances, and they are thus constantly reminded that they are paying more for the same service and possibly even subsidizing the cheaper trips of those who can afford to participate.

This sense of who can participate in the different forms of digital payments also became apparent when speaking to interlocutors who operate outside of conventional financial services. One interlocutor from the P2P lending group expressed that digital products were irrelevant for her because she only transacted in small quantities. “Only rich people need to send a lot of money, and we are ‘*orang bawah*’ here” she explained, referring to the lower-class distinction I have described in earlier chapters. Many of these women had an indirect experience with using the apps and explained that if they needed something, they would ask a friend, relative, or even a nearby stranger to place the order on their behalf and then pay in cash. She and the other women in the group are the types of people that GoPay and OVO are purportedly seeking to ‘bring into’ the financial system through their apps. Another interlocutor shared a story of how she had felt ashamed and judged by her community when she once ordered an online car, rather than a regular online motorcycle. Frustrated, she defended herself to me, saying that though people from her community think cars are for rich people, promos had made the trip affordable. These implicit social perceptions surrounding who can and should use which types of digital payments and

associated services illustrate the complexity of these emerging digital hierarchies. They remind us that the P on one side of the P2P exchange is a placeholder for a wide variety of people too, with diverging levels of access and resources for participating in the digital economy.

Credit and Debit in the Driver Account

When I first encountered these apps in 2018, I assumed that drivers and customers shared the same digital wallet infrastructure. After all, if I was paying them with my GoPay wallet it seemed natural to assume they were receiving it in their GoPay wallet. In practice, however, drivers use a separate app that contains three digital wallets. Firstly, a 'cash' wallet used to store income from digital payments. Then a 'credit' wallet, from which the company extracts their 20 per cent cut of earnings from trips. And finally, a direct link to the consumer wallet - GoPay for Gojek drivers, and OVO for Grab drivers. In Figure 13, a Grab driver shows me how these digital wallets appear in his app.

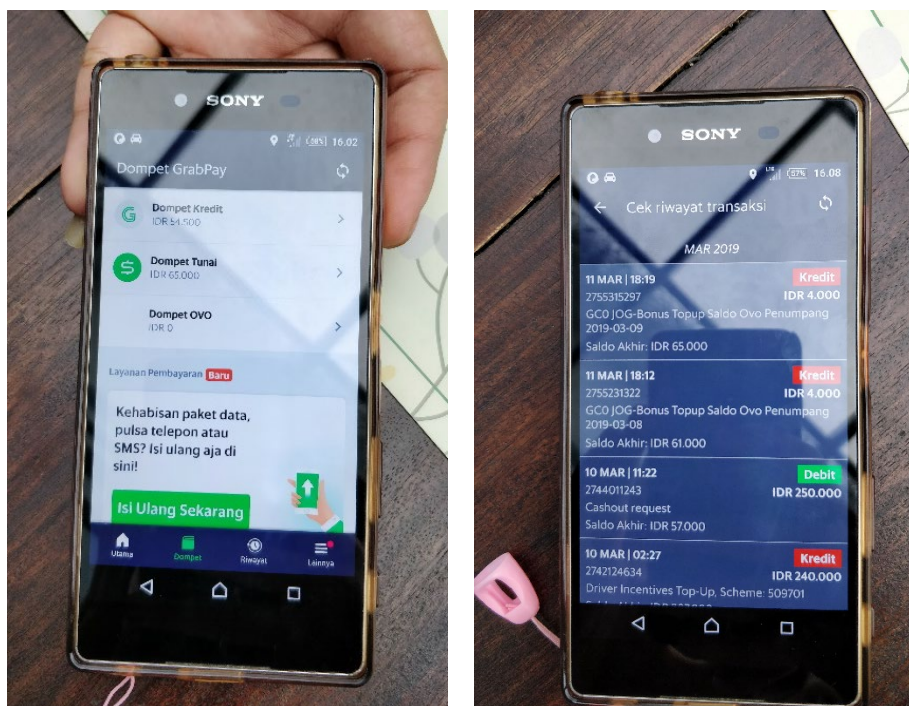


Figure 13: Grab driver shows credit, cash, and OVO 'wallets, followed by recent transaction history March 2019

As can be seen in the first picture, the heading of this wallet interface still reads "Dompot GrabPay", meaning GrabPay Wallet, referencing the integrated payment infrastructure that Grab uses in other countries of operation. This had to be replaced with OVO following the regulatory changes of 2017. As described, the relations between Grab and OVO are quite entangled, though this set-up makes it seem as though OVO is its own distinct wallet, rather than the underlying infrastructure of the entire system. When you pay for a Grab drivers' service, you pay with OVO

credits: the money stored in all of these three wallets are OVO credits.

This is evidenced in the second picture which shows the transaction history from the driver's 'cash' wallet, the values are credited and debited to his account. Here we see three distinct forms of transaction; income from a daily incentive bonus, 'cashing-out', and income as cashback bonus from having sold OVO to customers. Before we examine these transactions in more detail, I will look closer at the way that they are labelled and colour coded as 'credit' and 'debit'. Although the technology we see here is referred to as a *dompot*, or wallet, it is not in the same way a receptacle for storing money. What we see here is a technology for keeping account, where the company providing the technology controls both the driver's account and its transactional record. It struck me that the colouring of these labels seemed counterintuitive, as transactions representing income for the driver, the values 'credited' to his account were marked in red, a colour commonly associated with something negative, like an expense or a deficit. It makes more sense if we consider that this transaction history represents a very specific debt relationship that the driver has with the company managing the infrastructure. Whether something is a credit or a debit transaction, depends on from whose point of view the transaction is happening. In the image, when a driver receives Rp 4,000 as a cashback, the value is credited to his account and now represents a monetary value that he is owed by the company. It is an outstanding debt which the driver can claim when he decides to 'cash-out'. Cashing-out here means to make a request in the app to have some of his balance transferred to a bank account. In practice, there is no money moving from this app to his bank account. Instead, the company must transfer money from their bank account to his, and then debit his account the equivalent value, thus resolving part of their outstanding debt relationship and marking it in green in the app. To ensure that they can make such bank transfers, these companies are required by law, as described in chapter 2, to store an equivalent amount of money to the value of credits that they have issued.

The most important of the three wallets depicted above is the 'cash' wallet which is where most transactions take place. This is where drivers receive their payment from customers, their daily incentive bonuses, where they can 'cash-out' to a bank account, sell money to customers, or where they can 'top-up' through an agent if they run low on digital balance. Some drivers depend on being able to cash-out every day to have money to cover the expenses associated with being a driver, as well as to give to their families when returning home in the evening. Others might have a personal upper limit for their credit balance and will cash-out when they reach 500,000 or 1 million rupiah, not trusting the app to keep their money safe and thus not wanting to risk losing a higher amount. Alternatively, some drivers will transfer some if not all of their 'cash' balance directly to the third consumer wallet. This money will now be available when they open their

customer version of the app. Drivers must also maintain a balance in their 'credit' wallet by transferring money there from the 'cash' wallet. In an interesting reversal of the debt relationship, the 'credit' wallet is used by the companies to withdraw money that the drivers owe them as their 20 per cent 'cut' of cash payments. The companies simply withdraw their share of this income from the 'credit' wallet. This is why drivers must always ensure that there is a valid balance available. In the case of Grab, drivers who fall below a certain threshold will be blocked from receiving new orders. Gojek drivers, on the other hand, are allowed to 'go into debt' in their 'credit' wallet, as one interlocutor described it, though they will find that their outstanding balance is withdrawn from their next daily incentive bonus.

When I began my research, these were the only two wallets available to drivers. There was no way to directly transfer money earned as GoPay or OVO credits, into a GoPay or OVO customer account. When this feature came to be added, first by Grab, and later Gojek, drivers were suddenly able to 'cash-out' their earnings by transferring them to the customer wallet rather than simply transferring them to a bank account. One driver drove for Grab to generate additional income outside of his regular job and explained that he never actually cashed out his balance. Instead, he had mentally earmarked this extra income as 'luxury money', transferring his earnings directly to the OVO wallet. He was then able to treat his family to trips to the mall or cinema where large discounts are often offered for users of the digital payment apps. By using the money in the OVO form, he experienced that money he had already used would reappear in his wallet as 'cashback', ready to be used again another day, all the while generating valuable transactional metadata for the company.

Though drivers will always receive 80 per cent of a trip fee irrespective of whether the customer payment is cash or digital, there is a vast experiential difference between the two money forms. For instance, a driver complained to me about getting paid in cash because of the cut that Gojek would claim from his income. When I pointed out that he would have earned the same either way he disagreed with me. It was not the same, because it *feels* like you are losing more money when they take a cut from something that has already been experienced as income. "*Sudah disimulasikan,*" he said: the income has already been simulated. With the cash payment, the driver is suddenly burdened with having to keep track of how much they owe the company and make sure this sum is available to be removed later from a different wallet.

While I already described how drivers can 'cash-out' their balance to a bank account, there is one important element to this process yet to be described. It is not so much about what form that money takes, but the ability for money to transition flexibly between forms, to be *cair*. When you 'cash-out' of an app, the money is still not with you, it is just a number in a bank account. The

critical issue is materialising it as cash because cash is what is needed in most daily transactions. Furthermore, conventional gendered norms apply in relation to many household economies in Jogja, where many men are expected to earn a living and then bring this income to their wives at the end of the day for her to manage the household. One driver described how sometimes it might be a challenge to materialise his earnings before the end of the day. At the time his wife and daughter lived in central Java so they did not see each other daily, but he described how other drivers experienced feelings of shame or stress about not being able to bring home cash at the end of a workday.

It's harder, yes. Perhaps because the problem lies with the money – actually, it's just a difference of a day, you know. But when we get home, if... especially for Javanese, us Javanese here, when we get home, go to work, get home, gone by day, arrived by night, it would be splendid for us to bring something home. But when you're gone by day, you arrive by night, and you've got nothing... you know, your wife and kids are waiting at home. It's a matter of bringing money home, you see.

[Interlocutor 5]

The main way to materialise digital earnings into cash is to visit an ATM and withdraw your balance. Many drivers do not have a bank account when they register with the companies so they are provided with one upon registration as it is a necessary link in the process of circulating money. For instance, Gojek partners with the bank BCA to set drivers up with a simple account that comes with an ATM withdrawal card. I have tried unsuccessfully to find data about how many formerly 'unbanked' drivers have thus become customers of financial institutions through this Gojek program, but it does present an interesting twist to the narrative of financial inclusion through P2P payments: unbanked driver-partners are 'included' so that they can receive digital payments from consumer-cyborgs who are not required to have a bank account to use the app.

Using an ATM to materialise money may seem straightforward, but it comes with challenges. Firstly, it can be difficult at times to find an ATM and drivers may not have access to one when they live in areas skirting the city. Circulating while looking for an ATM also costs time which could be spent on other income-generating activities, or recreationally. Secondly, some drivers experienced that there would be delays in operations on weekends or during bank holidays so their money was not reliably available for withdrawal. Gojek describes these issues as an engineering problem to be solved by revising their codebase. Gojek is built on a backend codebase called 'Stan Marsh', named after a South Park character (Singh, 2018), and this code was never intended to be able to handle millions of transactions in coordination with banks. As they write on their blog: "We must admit that Stan Marsh only supported one bank and it was very difficult

to manage the system in terms of logs, data in the database and other details” (Budiari, 2019). According to the blog, this legacy code relied on manual operators: invisible human labour behind the veneer of a tech system, who would upon receiving the withdrawal requests submit them to the bank. Therefore, drivers could only withdraw money on weekdays and would sometimes experience extensive delays between a cash-out request and the money being available for withdrawal at an ATM. Meanwhile, the drivers would be left to trust the system, worrying whether their money would survive the journey from the app to their bank accounts. According to the blog, by collaborating with the IT teams of the banks, Gojek engineers were able to develop a new ‘withdrawal flow’, thus solving the ‘liquidity problem’ and enabling drivers to make ‘instant withdrawals’.

When I arrived in 2018, the bank holiday for Ramadan was just beginning and I spoke to several customers who were concerned about drivers who might have to go for a long time before being able to withdraw their balance. Some even described the circulation of messages through WhatsApp groups that people were encouraging each other to stick to cash payments throughout the holidays out of consideration for the drivers. While many drivers expressed how relying on this daily cash materialisation was a challenge for them, other drivers would tell me that they simply needed to plan in advance to ensure that they would have money available for times when withdrawals were not available. These differing experiences reflect people coming to the work of online driving from varying socio-economic backgrounds and how the job affords people varying degrees of precarity. Some drivers may be able to set money aside while others live day-to-day. Some drivers are taking advantage of cars they already own, and others are renting on a daily basis or have committed in advance with a down payment requiring regular instalments based on the expectation of high income from driving. Like the app’s customers, not all the P’s on this side of the equation are equal either. It is a reminder that the flow and circulation of digital money and its ability to exist in the forms that count as acceptable payment are determined by the underlying infrastructure and its developers, and that these infrastructural decisions impact people unevenly, exacerbating existing inequalities.

Mobile ATMs

As discussed, for the consumer-cyborgs to experience hassle-free and heavily discounted cashless payments, the driver-partners must be able to receive digital payments. Thus it is the driver-partners that are put in the position of having to materialise that digital value back into cash form for their own financial needs. In this section, I want to focus specifically on the role of drivers in the circulation of digital money through these app ecosystems, and how the companies mobilise them as exchange agents. I refer repeatedly to the integrated incentive mechanisms of the apps,

in which drivers accrue point throughout the day, and which I examine in detail in chapter 5.

Customers can top-up their accounts by requesting a driver once they are connected through a booking. Drivers can then 'sell' the digital balance available in their digital wallet in exchange for the equivalent amount in cash, which is known as selling saldo. There is no fee for the customer, but both Grab and Gojek have a form of commission to incentivise drivers to sell. Gojek drivers earn either half or full points, which count towards their daily incentive bonus target,²⁵ and Grab drivers receive up to 20 per cent of what they sell as a 'cashback' in their digital wallet. One Grab driver proudly shared that on a good day, some drivers could earn an additional Rp 100-150,000 just as cashbacks from selling saldo, implying sales of between Rp 500-750,000 in one day. Curious, I asked the driver what his strategy was for maintaining such high liquidity in his digital account. He argued that for the most part, it was not a problem since customers were constantly replenishing his account by paying through OVO, just as I had done for this trip. Incidentally, I had just asked him for a top-up equivalent to the cost of the trip, because, as described earlier, I was concerned with maintaining a digital balance too. I had made the cashless payment to get a discounted trip and then proceeded to use the same amount of cash to replenish my digital account in preparation for the next trip. From the driver's point of view, he had received my digital payment, and then sold me the same amount back, receiving Rp 20,000 in cash, but also receiving a digital Rp 4,000 from the company as a cashback incentive. The irony of this cash-filled cashless transaction was not lost on the driver. "*Uang memutar*" he laughed: *money goes around*. It was not an atypical exchange he explained. Like me, many passengers chose to top-up on each booking, opting for smaller and more frequent top-ups rather than maintaining a larger digital balance. Indeed, in the images shown in Figure 13, the driver has received two such cashbacks for selling exactly Rp 20,000.

Notably, drivers are not always a reliable source for topping-up. In some instances, this is simply because the infrastructure does not allow them to, as I will explore in the next chapter when I discuss the use of third-party accounts. For drivers that are technically able to sell saldo, there may be other reasons for refraining from doing so, and many drivers described being strategic regarding their role as exchange agents. For instance, Gojek Car drivers must sell at least Rp 100,000 at once to receive half a point, meaning they must do so at least twice for the full point to count towards the daily goal. Many drivers will therefore guard their balance and wait for the right customer. One driver described 'preparing' his balance when he began his day, calculating in advance how much he would be able to withdraw while still having enough to earn the full point.

²⁵ I explain the income mechanisms for drivers in detail in chapter 5.

He described how he found the experience of having to nudge passengers to make a sale humiliating.

If we carry out 1 trip, we get 1 point. If 100,000, we only get a half. Sometimes we're embarrassed to offer. Like, 'do you want to buy GoPay', sometimes we're embarrassed, sometimes not. Sometimes they'd be like, 'Yes, but I'd like 50,000', then I wouldn't gain anything. I'd rather not offer anything at all. That is why drivers would rather withdraw, no need to offer. If somebody wants to buy, I'd say that I don't have enough money. That's that. Because you'd not gain anything.

[Interlocutor 6]

Because of the half-point incentive structure, the driver would rather withdraw his balance and cash-out, than sell it to customers. In a focus group discussion, drivers described how they would take the initiative to offer an OVO transfer if the customer had made the trip booking with a cash payment:

A1: That depends, it eventually comes down to our own feelings. Whether they use – for instance, if they use cash, they pay with cash, we pretend to persuade them, 'Do you not use OVO? It's cheaper that way, you know.' That's how we persuade them, so they'd fill their OVO.

A2: That's the trick if drivers are too lazy to go to the ATM. Yes.

A1: We sell.

A2: So, if we don't feel like going to the ATM, that's the trick. We offer OVO to the customers.

[FGD 3]

Both examples illustrate how drivers must navigate multiple forms of liquidity. Their 'cash' wallet, their 'credit' wallet, their own OVO or GoPay wallets, and even the good-old-fashioned leather wallet. For drivers, selling balance to customers represents an important alternative way to 'cash-out'. By selling their balance, drivers instantly convert digital assets into cash without having to wait for the transfer to be processed by the system. Without finding and using an ATM, whilst still simultaneously being rewarded by the system in the form of points or cashback. Meanwhile, the e-money tokens continue circulating within the system and the company does not have to make a bank transfer to the driver.

Earlier, I shared the example of the trusting Gojek driver who surprisingly transferred Rp 100,000 to my account. At the time I was surprised because motorcycle drivers typically have a lower balance than car drivers and are seldom able to transfer such large amounts. When he arrived, I enquired about how he was able to make such a large transfer. Beaming, he pulled out a small device that he referred to as a *token*: a little digital key device issued by his bank which allowed

him to make rapid digital transfers between his bank accounts and the app, optimising his flexibility across all platforms. He had essentially converted himself into a digital ATM for his customers, extending the infrastructure of the payment platform even further for the consumer-cyborgs. But he had thus also managed to organise an on-the-go ATM service for himself, always able to transfer the necessary money for an exchange allowing him to withdraw cash from his customers.

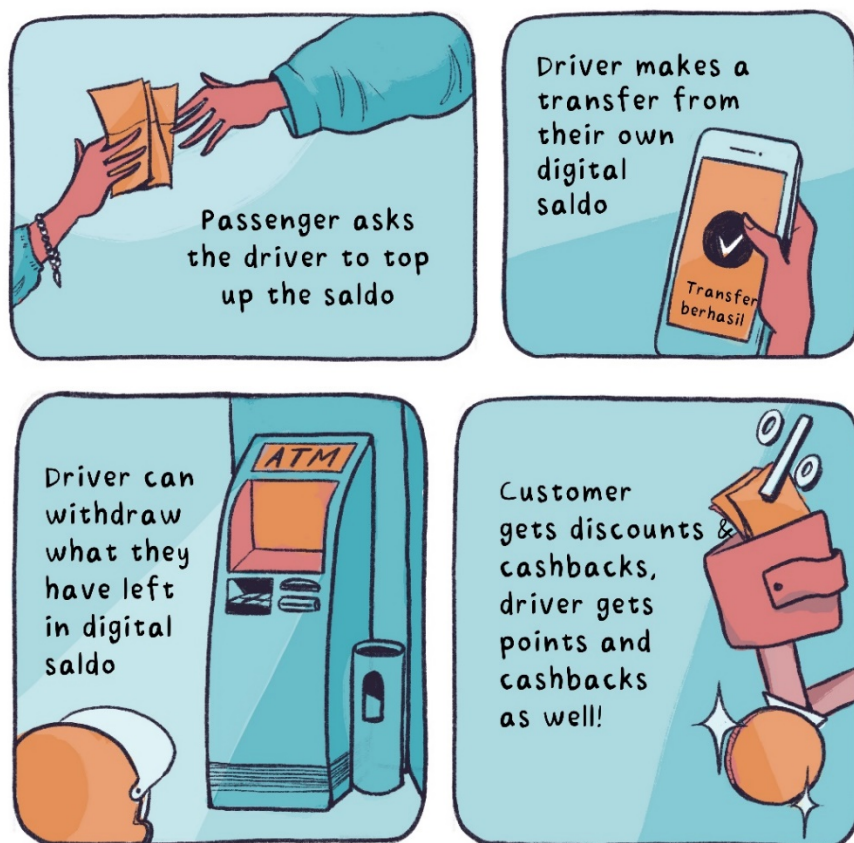


Illustration 3: Value circulates as cash, digital credit, bank balance, points, and cashbacks.

It is interesting to see how the different models chosen by Gojek and Grab affect how money circulates. In the first example, the Gojek driver deliberately withholds his balance until he finds the right customer, to the point of not being bothered with selling money at all because the feeling of wasting half a point is so significant. Rather than incentivise, it effectively presents a barrier to further circulation. In contrast, those working for Grab stand to benefit significantly from taking initiative because they receive a fixed percentage in commission. Towards the end of my fieldwork, some drivers began to disclose that points and percentages only counted if it was the first time a passenger received a digital top-up, indicating that the companies were now adapting their strategies to focus on onboarding new customers rather than just rewarding all drivers for facilitating an exchange. Whatever the specific mechanisms, these drivers are also doing the

persuasive work of bringing new customers into the digital payment ecosystems of these apps on behalf of the companies they work for. They are operating on the frontlines of the digital economy and it is interesting to note that the arguments they use are the same as those echoed by consumers. Digital payments are not 'less hassle' or even cashless. But instead, what the drivers emphasise is that digital money 'makes things cheaper'.

The experiences and strategies used by these drivers exemplify how the convergence of financial and transportation infrastructures can turn constraints, like the need for cash, into opportunities. The drivers actively manage the conversion of various forms of value, be it cash, saldo, incentives, bonuses, or customer ratings. For drivers, the ability to navigate between these forms of value and maintaining various balances is a critical skill to reap the marginal benefits of the various transactions. Having examined how the incentive mechanisms impact upon the circulation of money, I turn to an example of how the design of these exchange mechanisms can also expose drivers to dangerous situations and a loss of control of their balances.

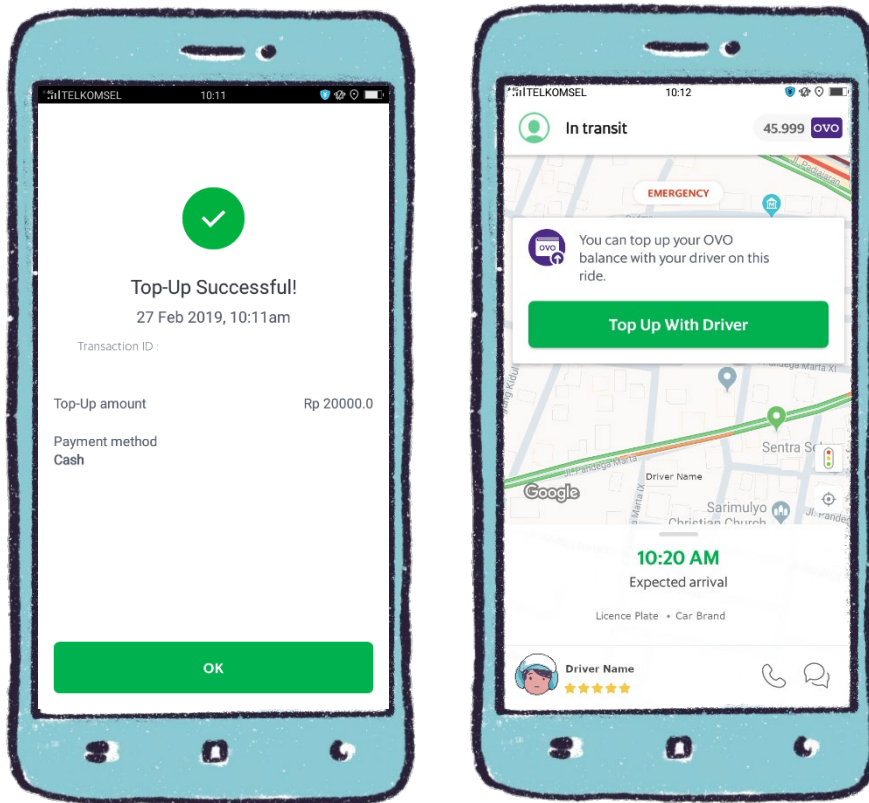
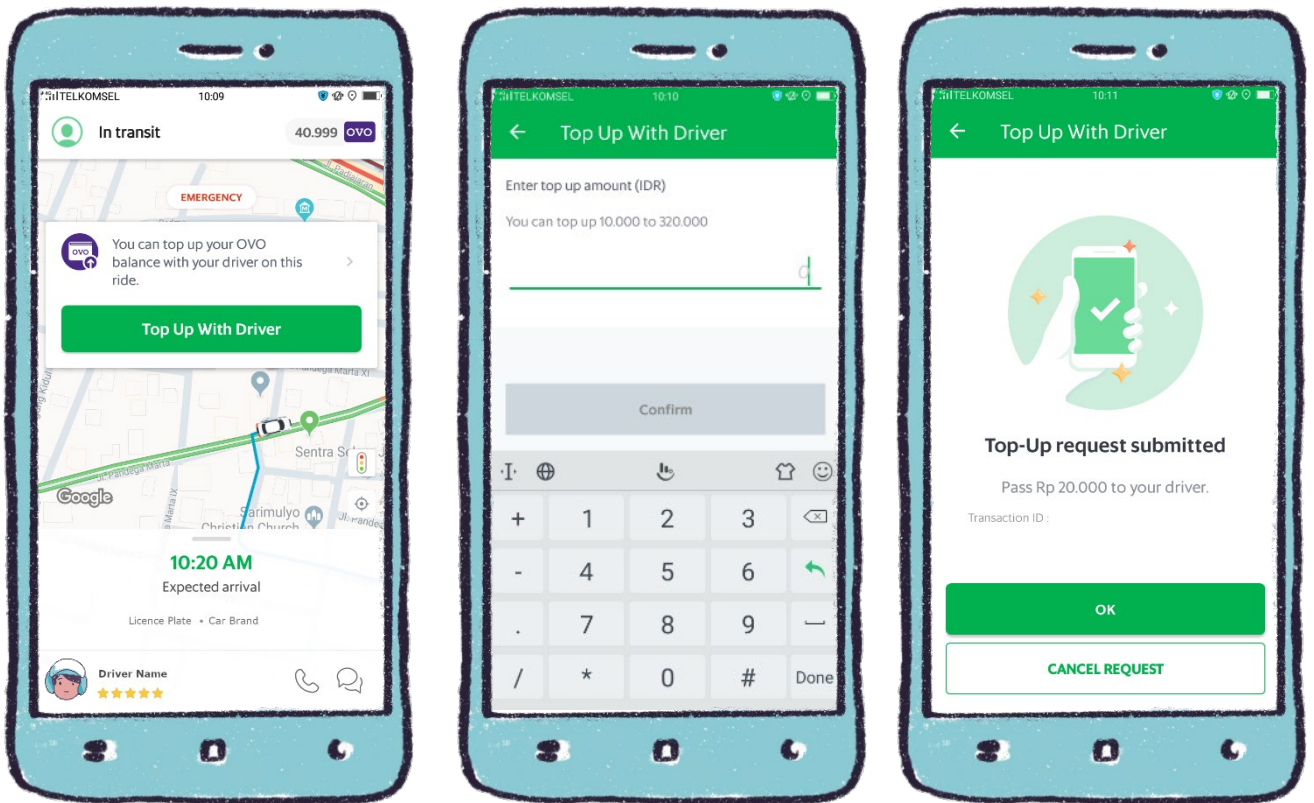
Towards the end of my fieldwork, I increasingly encountered drivers who expressed fears of what was generally referred to as 'OVO theft': customers stealing a driver's balance. One driver began by describing how he would occasionally receive trip bookings, only to find that the customer was not interested in taking a trip. Instead, they would ask him to make a digital transfer, treating him as a summonable digital ATM, "*Orang ini mau penipuan*": this person wants to scam me, he explained angrily. One of the frequent arguments in favour of digital payments is that it is somehow safer than cash because it reduces the risk of theft. It was hard for me to understand what 'theft' these drivers could be referring to. Cash money can be stolen, but a digital balance is not tangible, connected to an account that can always be accessed on a new device. Having spent a lot of time closely studying the interfaces of these apps, I simply did not see how a customer could access a driver's balance.

When asked to explain further, one driver vaguely suggested that it was due to *hypnosis*. This was a recurring theme in my fieldwork, where people would describe people they knew of having been 'hypnotised', for instance being manipulated to bring thieves with them to an ATM to extract money for them. In practice, hypnosis could also be a way of explaining something that might be embarrassing or shameful, such as having been tricked or conned out of your earnings. Asking another Grab driver about his experiences with OVO, he immediately shook his head exclaiming "Oh OVO!". The problem with OVO, he explained, was theft, or *pencurian*. "Whether I want to or not, I have to top-up, I can't cancel!" He draws out the last word, almost whistling it through his teeth in frustration. From his explanation, it was not clear to me if he was unable to cancel due to the pressures of algorithmic governance, or if Grab drivers were literally unable to decline a

customer's request for a top-up due to the design of the app's interface.

To better understand this situation, it is important to note that Gojek and Grab have implemented different mechanisms for driver top-ups. Where Gojek relies on passengers and drivers to negotiate an exchange, ultimately giving the agency to the driver to decide how to distribute their saldo, Grab has opted for a system where customers make top-up requests through the app interface. This represents a key difference in how the exchange dynamic is implemented in the design of the apps, as illustrated in Screenshot 12 from a top-up transaction between a Grab driver and myself in February 2019.

Once my booking is accepted by the driver, the app covers most of the map with an uncloseable splash screen with a dominating green button encouraging me to top-up my balance with the driver. After clicking the button, the next screen informs me that I can request between Rp 10,000 to Rp 320,000 from the driver and gives me the option to enter a figure. The app now shows me a comforting image, with a sparkling green checkmark: my request has been successfully submitted! In the car, the driver reaches for his phone to make some rapid taps and almost instantly a new splash screen appears on my screen, telling me that the top-up has been successful. As I hand Rp 20,000 in cash to the driver, he asks me to check that the transaction went through. I tap 'Okay', and the screen returns to the map.



Screenshot 12: Top-up transaction with Grab driver.
27 February 2019.

There are a few things that the customer does not see in this interaction. Firstly, when the app tells me how much money I can request, the number it shows me is the contents of the driver's digital 'cash' wallet. Secondly, when I make the request through the interface the driver receives a notification that the customer has requested a top-up.²⁶ Upon clicking the notification a splash screen appears detailing the amount requested. There is a graphic showing cash money moving in one direction and digital money moving in another. The text reads: "Get money from the passenger to make a top-up. The amount will be taken from your Cash Wallet." There is another dominating green button, but this one reads "Collect Money". Once the driver clicks the button the digital transaction takes place and the driver is supposed to collect the equivalent amount of cash from the customer. Notably, there is no button to decline the transaction, only a "Report Mistake" tab. The button does not even say "Confirm Transaction": once requested by the customer the transaction is inevitable and there is no meaningful agency for the driver.

As digital money agents, the drivers and their entire digital balances are simply made available to the customer. This is the moment of supposed 'hypnosis', where a passenger manages to leave this transaction without the driver receiving the cash compensation. Perhaps the driver is hypnotized, scammed, or outright robbed if the passenger forgets to hand over the cash before leaving the vehicle. The design of this transaction exposes the disadvantages for the driver and echoes Nadiem Makarim's description of consumer-cyborgs; drivers operate as an extension of the cyborg body providing enabling the digital payment system to function in practice.

There is a threat of suspension from labour which keeps drivers hostage to both customers and company, and which I will discuss in the next chapter. Even if they have the option to cancel a transaction, the drivers may still feel obliged to go through with it to appease the passenger for a favourable rating. Whilst there may not be any transaction fees for customers using drivers to top-up, the companies load transaction costs onto the drivers in the form of incentives and penalties. They bear all the risks involved to facilitate access to the digital economy. Driver-partners are mobilised by the companies as exchange agents, enabling consumer-cyborgs to have cheaper, hassle-free, and cashless transactions. Meanwhile, the driver-partners take on the additional challenges of maintaining liquidity and materialising their income as cash.

²⁶ As I am not a driver, I have had to rely here on accounts that the drivers have given to me through interviews, screenshots that they have shared, and by finding the rich visual material that drivers communities upload to YouTube as tutorials and tips for other drivers. The driver side of the Grab top-up can be seen in this driver tutorial:

https://www.youtube.com/watch?v=wHo65z3soqo&ab_channel=ZonaTutorial

4.3 Conclusion

It is a curious paradox how much cash is involved in this cashless payment system to make it function in practice. This is not a critique. I would argue that making money *cair*, making it easy for people to convert it into whichever form best suits their purposes can be a valuable technology. Such flexibility is especially valuable in a contest where there is great inequality of access to digital tools. However, as these platforms expand their services, especially while actively disadvantaging cash users, the seamless automation implied by a cashless transaction seems disingenuous while also obscuring the underlying dynamics imposed by the digital infrastructure.

The Indonesian payment apps work on the premise that you purchase digital credits, known as e-money, which are then stored as a credit balance in your account accessible through the app interface. Unless you upgrade the account, money converted into digital credit can only exit the app in the form of payment. For the customer, it is not intended to leave the system again as cash. In this way, it operates in a similar way to a gift card, in this case, earmarking the money to be used for merchants that are affiliated with the respective platforms. This earmarking is noticeable even in the mental distinction that people make between forms of money, referring to 'my OVO' or 'my GoPay' almost as though it were a currency distinct from rupiah. With each app issuing its own currency, users must maintain a credit balance across multiple platforms. On the one hand, to be able to make digital payments to people only receiving payments through a specific app, but also to take advantage of the many promotional offers that the apps use to compete for customers. Spreading your money across multiple platforms means always having the right type of currency for your desired purchase. In practice, cash becomes a common part of cashless transactions, as users top-up their accounts in smaller quantities to ensure that they are always able to make their payment cheaply and digitally.

The e-money exists to enable digital transaction as payment for services purchased within the app environment. The apps effectively advertise it internally to their customers as a preferable product for transaction than the cash rupiah offered by the Indonesian state. They do so by emphasising how e-money makes things more affordable, incentivising customers to channel their payments through the digital infrastructure not just through the use of discounts, but with emphatic visual communication intended to reinforce the cost of using cash. As the platform controls both the ecosystem of services and the integrated payment mechanism, they control not just the price of the services but also the price of making the payment. The artificial cost of cash is one that they have introduced.

The outcome is that the introduction of digital payments conversely seems to make things more

expensive for those unable to, or uninterested in maintaining a digital balance. The discounts on digital payments, mean that users confined to cash are always paying more for the same services, effectively contributing to the subsidisation of those with the resources to maintain digital balances. It is the ability of digital money to make things cheaper that is a prominent part of their appeal. More so than other arguments in favour of cashless payments, such as being more convenient or safe, it was the ability of these apps to make things that might otherwise be considered extravagant affordable. Being able to pay someone to deliver food to your home, to drive you in a car rather than on a motorcycle, to buy food from an international chain restaurant at the mall. These apps give access to, and encourage, the type of consumerism that is affiliated with a middle-class lifestyle.

It is a reminder that not everyone engages with these apps on equal terms. Digital payments as they exist in these apps enable *some* of the apps customers to access cheaper services through hassle-free, cashless payments. In practice, it is the people who are already in a position of being able to afford good network connectivity, higher quality mobile devices that can store multiple apps, and who can afford to maintain multiple balances that are best positioned to take advantage of this new digital economy.

The experience of cashlessness differs not just between customers, but also between the customer and the driver. Theoretically, P2P payments systems allow users to transact money digitally without having to use a bank. Yet to register as a driver-partner, drivers must have a bank account, to the point of being assigned one upon registration if they are, in fact, unbanked. They must have a bank account so that they can extract their income from digital payments. In this way, drivers enable customers to experience 'hassle-free' transactions, because the hassle of cash is transferred onto them. It is drivers that must ensure that the money they earn can be materialised as cash: it is the driver that would pay for my coffee order with cash so that I could make the payment digitally. The cashless economy is enabled not just through digital technology, but largely also by its social infrastructure and continuous circulation of cash itself.

Incentive mechanisms within the app encourage drivers to sell the digital credits that they accumulate as payment back to customers in exchange for cash. In this way, they function as a 'human ATM' for digital money (Maurer et al., 2013a; Park, 2020). Drivers make use of the same feature, using their customers as ATMs for cash by encouraging them to buy digital credits as an easy mechanism to convert their digital value into cash value. Drivers deploy various strategies in their role as exchange agents, taking advantage of the specific mechanisms of the different apps to maximise the marginal gains of a well-timed exchange. As drivers must maintain liquidity across multiple balances within the same app, the agency over their digital credits is an important

aspect of manoeuvring money strategically.

Though these apps present themselves as neutral platforms where parties can find one another and exchange money and services, careful examination of the infrastructure can reveal careless designs leaving the digital wallets of drivers vulnerable for exploitation. In the example I shared, the interface of a top-up exchange was designed in a way that privileged the needs of the customer, to the point that drivers lose control over whether to sell their money and become at risk for people simply stealing their earnings by requesting a top-up through the app and leaving without compensating the driver with cash. It is an example of a cruel design that, perhaps unintentionally, causes pain to its users through lacking consideration for the consequences. This is caused by an infrastructural arrangement that prioritises the needs of the customer to access digital money, and in doing so, the needs of the company to bring customers into their digital ecosystem. The drivers and their digital balance are simply assumed to be available on-demand.

Thus, the labour of driver-partners, channelling money into, through, and out of the digital payment system, constitute an important infrastructural extension of the digital payment systems of the Indonesian ride-hailing apps. Though both drivers and customers are users of the same platform, their conditions for use are not the same. In the next chapter, I explore how the app configures drivers into a relationship of servitude rather than one of equal exchange to their customers and thus to the platform companies, through the algorithmic governance of the app.

5.1 Introduction

As ride-hailing companies both Gojek and Grab deploy governing mechanisms through their app to manage their driver fleets and to mobilise them in service of the digital economy. In some instances, these mechanisms are familiar to those known through other examples of gig economy work, including incentivising behaviour deemed desirable by the company and implementing punitive mechanisms for undesirable behaviour (Rosenblat and Stark, 2016). These design choices also reveal to us how the companies expect drivers to use the apps, and how they envision the driver-partner role. In this chapter, I explore four prominent conditions for being a driver-partner in Jogja: the relation between the driver and the company, how to make an incentivised living, the role of third-party intermediaries, and being forced to adapt to the ever-changing labour conditions imposed by algorithmic governance.

I begin by examining the dynamics of the ‘partnership’ between the companies and their fleets of driver-partners and show how expectations about this relationship, stemming from the word ‘partner’, have led to disappointment and disillusionment for some drivers. In practice, though there is a mutual dependence between the company and drivers, the power dynamics of the relationship are highly unequal. This means that drivers have little control over the continual development of the app, having simply to accept the changes that come with each update to their accounts as the companies reconfigure what it means to be a driver-partner. To better understand the mechanics of how drivers are mobilised in service of the apps customers I examine how drivers make a living through the app. Specifically, I examine how the impact of lowering the costs for customers leads to drivers depending on earning daily incentive bonuses to complete their income. I show how these same mechanisms keep drivers circulating for as long as possible as they ‘chase points’ to reach their daily incentive targets. I examine how customers are enrolled in the monitoring of drivers, who are thus forced to engage in extensive relational work to manage

the conditions of exchange. Thus, working as a driver involves conducting complex value and risk assessments and at times taking gambles to make a living from the app.

In the second section, I explore the role of so-called 'account vendors'. Vendors are an integrated third-party intermediary on the Gojek platform that involve slightly different conditions for participation than for drivers who register accounts directly through the Gojek platform. This is particularly interesting as vendors control access to the digital income for their drivers, once again challenging the vision of direct peer-to-peer (P2P) payments by showing how these technologies leave room for new forms of brokerage. I show how vendors perform an ambiguous role in relation to drivers, as they contribute to the configuration of the driver-partner through their communicative practices. In the final section, I examine events surrounding the introduction of a new incentive point system in March 2019 which dramatically changed the labour conditions of drivers. I show how drivers attempted to challenge this system through protest and through making themselves temporarily unavailable to the consumer-cyborgs. I show how drivers collaborate to make sense of these algorithmic changes in the face of lacking transparency from the companies, disseminating strategies to counteract the new conditions but also internalise the moral doctrines of work implied by the new system to justify the exploitation of 'lazy' and the rewarding of 'diligent' drivers.

5.2 Driver-Partners

The drivers who work for Gojek and Grab refer to themselves as *ojol*, a contraction of '*ojek online*', *ojek* being the informal term for motorcycle-taxi drivers, or simply distinguish themselves from conventional car-taxis by referring to themselves as 'online drivers'. What distinguishes these online drivers from their 'offline' counterparts, begins with the creation of a driver-partner account: the entry point to access the app infrastructure, its customers, and income opportunities. As a customer, making an account is both relatively easy, anonymous and for now, you can always create a new one. For drivers, accounts are a limited resource they must be treated with great care. As I will show in this chapter, the behaviour of a driver affects the quality of an account, its ability to receive orders, access the best bonuses, and thus generate income for its driver. It can also be lost if, for instance, the company decides its owner has violated the terms and conditions of use.

In this section, I centre the experience of these drivers in relation to both the companies and to their customers, and how this has changed as the apps continue to develop. I examine the underlying governance dynamics that the apps implement to mobilise drivers in accordance with the needs of the company. While there is increasing awareness of how these companies can be

exploitative towards drivers, I also explore how customers are enrolled as participants in that exploitation. I show how the visual language of the apps and the mechanisms of the infrastructure communicate certain expectations to customers which they, in turn, impose upon drivers. In this way, the app configures both driver-partners and consumer-cyborgs into particular unequal exchange dynamics.

“Servant, Probably”

To become a driver, you need to register formally with one of the app companies either in person at their local branch office or through an online service. To be approved, you must submit documentation including your formal identity card, driver license, a photograph, proof of insurance, as well as a clean criminal record. When registering, you must also register your vehicle which must fulfil certain safety standards. Once your registration is approved you can activate your account via the driver version of the Gojek or Grab app. Some drivers described being given additional material, such as a tutorial or driving safety videos to watch or having to pass additional tests. During my fieldwork in Jogja in 2018, the option of registering as a GoCar driver was suspended indefinitely by Gojek. Drivers blamed market saturation and accused Gojek of registering more drivers than there were customers. Some drivers suggested that the suspension was caused by disagreements with local government officials, hoping that whatever the issue was would be resolved soon so that formal registration would open again. For drivers unable to register for a formal account, be it due to the closed registers or for not meeting the requirements, there are still other options. Drivers can register through an ‘account vendor’, a peculiar semi-formal arrangement supported by Gojek where vendors can open accounts for drivers. Vendors control the driver’s digital wallet and charge a commission for transferring driver earnings to their designated bank accounts. I will go into more depth about the role of account vendors later in this chapter, and how having a ‘vendor account’ is distinct from having what drivers referred to as a ‘corporate account’, meaning registered directly with the company. By 2019, even vendor registration had closed making the only way to access an account was to buy or borrow one belonging to a friend or relative, violating the company terms of use.

It is also important to understand that many of the drivers, especially earlier in 2018, were maintaining accounts for both Gojek and Grab, doing what they called *kerja dobel*, or double work. For drivers, this was a way to optimise their workflow. If they were unable to get customer orders through one app, they might be luckier in the other one. But double work is a violation of the terms of use and many drivers expressed fears of getting caught, deploying a variety of strategies to avoid detection. Some drivers suggested that by activating both apps at the same time the GPS might give you away. Others cited that companies compared databases and to avoid registering

the same phone number twice you should keep two separate SIM cards. Others felt safer with two separate phones, installing only one app on each, convinced that they would somehow be able to identify each other if on the same device. Other drivers opted to register as a car driver in one app, and a motorcycle in the other, to make sure that the license plates were not the same. This also means that most of my interlocutors did not identify strongly with being either a Gojek or Grab driver. Instead, the defining feature was in being *online* creating the distinct category of drivers who were *offline* providing the service of the conventional ojek or taxi drivers. Throughout my fieldwork, there were multiple examples of tension arising between online and offline drivers, at times resulting in physical violence but also in the establishment of 'red zones' where online transport was banned. As mentioned earlier in this thesis, the existence of these ride-hailing apps meant that an increasing amount of conventional taxi drivers found themselves forced to use the apps to access customers.

Not all drivers engage in double work and not all drivers even work full time. The drivers I spoke with were very diverse in terms of background and approach to their work as online drivers. From a former bank employee, a pharmacist, a former head of the Faculty of Cultural Sciences, food stall owners, a post office employee, self-taught IT students, an insurance broker, a wedding planner, a logo designer, a librarian, to predictably, several conventional taxi drivers. Some relied on driving as their only source of income, others drove temporarily whilst between other jobs, and some saw driving as a supplementary income. Some drivers also engaged deeply in the identity of being an online driver, participating in company events, demonstrations, or driver communities, while others kept their distance from other drivers, preferring to see themselves as freelancers or self-employed. The particulars of this identity and the dynamics of the driver communities are beyond the scope of this thesis but have been studied by Rida Qadri, who explores how they represent an alternative contextual outcome to the atomisation of the labour force described among other workers of the gig economy (cf. Qadri, 2020a).

When asked to describe their relationship to the app company, drivers would generally describe themselves as *mitra*, meaning partners, in the sense of being a business associate. This is also the term that the companies use: driver-partners. "Kita mitra!": we are partners, a driver once told me without hesitation, the others sitting around us at a driver community 'basecamp' agreeing about their relationship to Gojek. Next to us, a driver who had been listening to our conversation interjected, "*Tapi tidak pernah ketemu*": but we have never met. It was not uncommon for drivers to offer a similar reflection about the conditions of this partnership. They were partners with the app company who relied on each other for income, yet they were not equal parties.

One respondent characterised the relationship as being synergistic, with both sides benefiting

from one another. After all, the company was providing him with an important income opportunity. He had recently moved back to Jogja to take care of his ailing mother. Despite years of experience in the pharmaceutical industry he had struggled to find work in Jogja until he was able to register for an account with Grab. In his opinion, this is what he felt made the cut of his earnings that the company charged for their services fair. He was not alone in describing this experience of mutual dependence. The dependencies between drivers and the company can be described as follows. Drivers register for accounts and gain access to a job and a source of income. In return, the companies charge them a cut of their earnings and rely on their infrastructural services to further the interests of the company. Neither can exist without the other. However, the company depends on the drivers as a group, and their concern is to maintain an active and functioning fleet. Drivers, on the other hand, depend upon the companies as individuals and because there are so many of them, each individual driver is dispensable. Thus, it is also the company's prerogative to cut drivers off from access to the platform if they determine drivers have violated the terms of use. There will always be another person willing to do the job. One driver summarised this problem by pointing out that at the end of the day the company concerns itself with the interests of the customer, the consumer-cyborg buying services through the app by making sure these services are always available, always on-demand.

At the same time, these companies aggressively pursue this partnership narrative through public events, video campaigns and even award ceremonies. One driver proudly told me about how he had recently been invited to a company event because he had been rated among the five 'best' drivers in Jogja according to customer ratings. In chapter 2, I showed how comments made by both Nadiem Makarim of Gojek and Jason Thomsen of OVO emphasised the significance of drivers to their companies. Drivers are described in terms that make their work seem important, noble even, and their livelihoods as a core motivation for the business. Makarim even stressed how he felt his app had formalised the ojek trade and improved social recognition for drivers. Meanwhile, one could argue that the use of the term 'partner' is also a deliberate category, distinct from the responsibilities and obligations implied by the term 'employee'.

Alex Rosenblat writes about this use of language in the so-called 'gig economy', noting the similar ride-hailing app Uber where "drivers are barely treated as workers at all" (Rosenblat, 2018, p. 8). For Uber, drivers are legally classified as 'independent contractors', excluding them from worker protections. Using expressions such as entrepreneur, contractor, and driver-partner obscure the underlying reality that these companies treat drivers as though they were just another category of user of the app platform. As Rosenblat notes, Uber defines itself not as a transport company, but as a technology company, which affects how they are regulated. In practice, this means that

these companies categorise both customers and drivers as consumers of the technological platform they provide. Independent equal parties making an exchange on a neutral platform. As a consumer of an app you may access certain opportunities, but you also willingly accept the conditions of use that are subject to its governance mechanisms, risking punitive action from the companies that control them.

By 2019, some drivers openly laughed when I asked them how they felt about the word *mitra*, explaining to me the disappointment and disillusion they felt with the companies. This emphasises that an equal partnership should be built on mutual respect and collaboration. In a focus group interview with three drivers, one driver laughed when I asked about the word *mitra*: “That’s what they said [all three laugh]. They said that we’re partners, but what we are feeling is not partnership.” They described various examples of how they felt this partnership role was not being fulfilled by the company, and eventually, I asked them what word they might choose to describe the relation instead:

Q: If you could choose another word, what would it be?

A1: Servant, probably. [laughs]

Q: What would you normally say?

A1: Just driver. Well, we are just drivers. We are not partners. If we are partners, then there should be two-way communication.

A2: It’s like this. According to me, we need them, but they don’t need us. [Imitating company] “If you don’t want to work with me, then suit yourself.” That’s how it is. If you want to quit, then go ahead. But why can’t we be like that? Because we need them, we need jobs from them, you see. That’s how it is.

[FGD 3]

When drivers sign up, they accept the terms and conditions that come with working as an ‘online driver’. However, as many interlocutors have pointed out, those conditions frequently change without warning or consultation with the drivers. There is no two-way negotiation about the challenges that drivers face from the app and driver-partners are subject to changing conditions rather than actively contributing to the development of their role. The fact that drivers depend on the apps individually means that they are also precariously positioned. They experience that the apps define them as on-demand servants, their labour mobilised and channelled through the app infrastructure to serve the needs of the consumer-cyborgs, and ultimately the financial interests of the companies.

This point, that driver-partners function as on-demand servants, is well illustrated by a story told to me by an interlocutor over dinner in early 2018. She had grown up in Jogja, moving back to settle there with her family after spending some years abroad. To manage the daily logistics, she

employed a driver who could be trusted to transport her children to and from school, as well as their other social activities. After a few months, the driver quit. He had earned enough money for a down payment on a motorcycle and informed her that he was now going to work as an online driver. She told me, it had become clear that he was earning more than he had done while working for her full time. At first, she had been stumped about how to manage the logistics, but taking a leaf out of the driver's book, decided that perhaps online drivers could be a solution for her as well. Now, she uses the apps to book any necessary drives for her children, paying directly with the app. She confided, the whole family now uses online transport rather than driving themselves. The low minimum wage in Indonesia, and particularly as pointed out earlier in Jogja, mean that the driver initially found it more profitable to change to on-demand labour. Meanwhile, the interlocutor found that it was also cheaper and more convenient for her to simply hire someone to drive her when she needed it, rather than employ someone full-time.

Making an Incentivised Living

To better understand how drivers are mobilised as on-demand servants, I want to convey how earning a living through these platforms is experienced. While the overarching app governance mechanisms are similar across all the cities where the apps are in operation, each location has its variations and they change rapidly as the apps are updated regularly by the companies. The details described here are specific to the Jogja context at the time I was conducting fieldwork.

There are two ways for drivers to earn money built into these apps; 1) payment and tips for services from customers, and 2) a daily bonus issued by the company.

When a customer makes a booking, the app suggests a route and calculates the cost of the trip based on a set fee per kilometre called a tariff. For instance, in Jogja, the minimum rate for an order was Rp 9,000, followed by a set rate of Rp 3,500 per kilometre for a car ride, and less for a motorcycle ride. Many drivers expressed that these tariffs were set artificially low by the companies to attract customers by making the service cheap. The driver is not compensated for any travel involved in reaching the customer, or for the return trip if the customer travelled far away. Though these apps deploy dynamic pricing in times where there is a surge in demand, it does not consider the time spent in traffic jams. Customers can choose to offer a tip either through the app's digital payment system or in cash after the trip to compensate for such inconveniences, but this still relies on the customers' sense of responsibility and does not provide a reliable source of income.

To compensate for the low tariff and to incentivise the drivers to work as much as possible, drivers can earn bonus points according to a three-tiered point system. Each tier has a target number of

points and corresponds to a set amount of money denominated in rupiah. Points are accumulated throughout the day and the bonus is calculated at midnight, after which drivers are supposed to receive their bonus in the form of credit issued to their digital wallet. This bonus can comprise a major portion of daily earnings. One motorcycle driver estimated that if he reached the highest tier, which was worth Rp 80,000 at the time, he could earn about Rp 240,000 per day on average, meaning that the bonus constituted about a third of his daily income.

Driver-partners are not employees and are not guaranteed to earn an hourly or even daily minimum rate no matter how many hours they spend on the road looking for orders and customers. Meanwhile, they continue to have basic expenses stemming from the work itself such as vehicle fuel, pulsa and data packages to ensure that they can receive orders. Many drivers also rent their vehicles, committing in advance to paying daily instalments putting them in a difficult and vulnerable position if they are unable to reach their daily income goals. Thus, drivers often depend on reaching the daily bonus tiers in order to make a viable living from the app. In practice, this means that many drivers find themselves 'chasing points', ending their workday not at a set time, but when they were able to *tupo*, a contraction of *tutup poin* meaning to 'close the points' needed for a target bonus tier. Through the point system, the apps also subtly communicate to drivers what they can consider working hours. As two drivers described it:

- A1: So, we were told indirectly that we should be resting for those 5 hours.
And then when 5 a.m. arrives, we'd be able to work again.
- A2: Well, they don't really tell us, but we're just kind of obeying them. I don't really know, the system over there is the one regulating it.

[FGD 3]

Though the app is always operational, Grab does not award points between midnight and 5 in the morning, meaning that the reward for driving at that time is reduced. For drivers, this means there is no purpose in chasing points, and thus this time period operates as a form of enforced rest. Gojek on the other hand allows drivers to collect points 24/7. In Figure 14, three drivers show me how the incentive mechanism appears in the driver app:

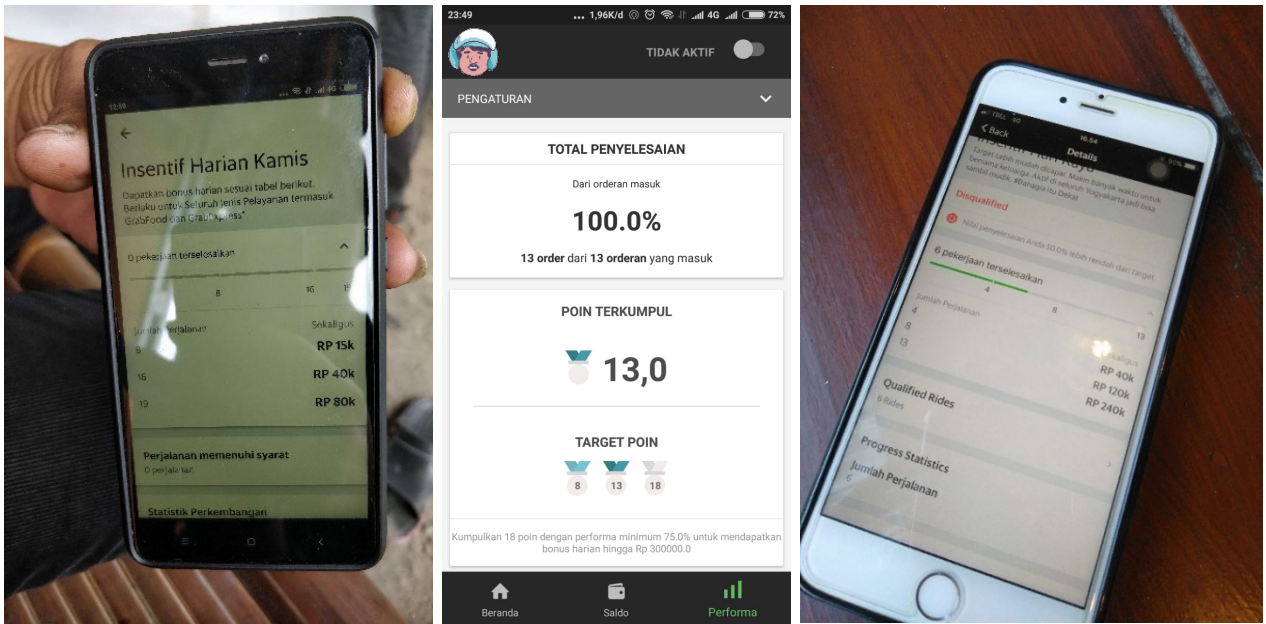


Figure 14: A Grab motorcycle driver shows me his daily incentive scheme, a screenshot from a GoCar driver who has successfully earned the middle bonus tier, a Grab car driver showing me how he was disqualified from his bonus due to cancellations. All images from 2018.

In the first image, a Grab motorcycle driver shows me the ‘Thursday Incentives’ overview in his app. It shows three tiers at 8 – 16 – 19 points and their respective values as they accrue towards a total of Rp 80,000, which is the maximum bonus he can earn each day. The second image is a screenshot, sent via WhatsApp by a driver shortly before the midnight reset. During an interview earlier that day, I had expressed concern that he was taking time away from work, which would impact him not only in terms of payment from trips but also in terms of reaching his bonus. He sent me this image to reassure me that he had reached his goal of the middle tier, though it had taken him the rest of the day. In the screenshot, we see that the GoCar tiers are at 8 – 13 – 18 points and that he had completed 100 per cent of his orders that day. At the bottom, a message reads that reaching 18 points with a 75 per cent ‘performance rating’ will result in a daily bonus of Rp 300,000. The final image is from a Grab car driver and shows how he was disqualified from his daily bonus due to an order completion rate of only 50 per cent. The tiers here are at 4 – 8 – 13 points, with the maximum daily bonus being Rp 240,000. This driver had earned 6 points qualifying him for the first tier worth Rp 40,000. However, because he had cancelled 50 per cent of his orders that day, his ‘performance rating’ had fallen below the 60 per cent Grab requirement and the bonus was forfeit.

I will examine this ‘performance rating’ and the forfeiture of bonus shortly, but first, let us examine these point scales in more detail. As can be seen in these images, this tier scale differs depending on which app you are using and whether you are a motorcycle or car driver. Furthermore, the tiers vary depending on which city you drive in. In some instances, it may even rely on what day

of the week you are driving and the time of day. The tiers are subject to change as companies adjust them typically by increasing the number of points required for a tier or reducing the value of the bonus.

In 2018, the bonus tier system for Grab car drivers worked as follows. If you get 4 points, you reach the first point tier and are entitled to a Rp 40,000 bonus. If you get 8 points and thus reach the second tier, you get Rp 120,000. Reaching the final tier with 13 points, earns you the maximum available bonus of Rp 240,000. Examining the monetary value of each tier reveals an interesting pattern, as the value of points increases for each tier. As can be seen in the first table in Figure 15, the last 5 points you earn before reaching the maximum bonus are more than twice as valuable as the first 4 points you earn.²⁷ The second table shows how the number of points required to achieve the same bonus had changed by 2019. The value of points earned on the first and second tiers had both declined, leaving the value of a point on the final tier four times as high as the value of a point on the first tier.

	Tiers	Points	Tier bonus	IDR per tier	IDR per point
Grab Car 2018	4	4	40,000	40,000	10,000
	8	+4	120,000	+80,000	20,000
	13	+5	240,000	+120,000	24,000
	Total points: 13		Total bonus: 240,000		
	Tiers	Points	Tier bonus	IDR per tier	IDR per point
Grab Car 2019	5	5	35,000	35,000	7,000
	11	+6	120,000	+85,000	14,200
	15	+4	240,000	+120,000	30,000
	Total points: 15		Total bonus: 240,000		

Figure 15: Tables breaking down the point value for Grab car drivers in 2018 and 2019. Based on numbers shown in driver apps in this period.

²⁷ I received the numbers used in these tables from Grab drivers who shared their screenshots of the incentive interfaces in 2018 and 2019 respectively.

In practice, this means that for a Grab driver that has reached the second tier by completing 11 trips, just completing 4 more will double their daily bonus. By increasing the value of the final points, these apps create a strong incentive for drivers to continue working for as long as possible, thus continuing to make themselves available for the consumer-cyborgs. This is reinforced by a more punitive mechanism: drivers are only eligible to receive their bonus if they maintain their aforementioned 'performance rating'. As one Gojek driver explained it to me:

For example, if we cancelled 4 people, 3 people or even only 1 passenger, our percentage could drop easily. They automatically cut our performance points, and then we have a 'debt' there. We have a kind of debt for how many trips we have to accept to lift our percentage performance point to get past 75 per cent.

[Interlocutor 7]

The 'debt trip' occurs when a driver has already reached a certain bonus level but falls below the required order completion rate. To receive the bonus, the driver must then complete enough additional trips to get back above the acceptable 'performance rating'. The term 'productivity rating' is a euphemism for the rate at which drivers cancel customer orders after accepting them. For customers, this can be a frustrating experience and leads to a disruptive and unreliable service, something that is not desirable for the company. By tying the payment of the bonus to the order completion rate, it discourages drivers from cancelling. However, there are many reasons why a driver might want or need to cancel an order, beginning with how the app infrastructures and interfaces cause drivers to accept orders in the first place.

Cancellations

When a customer enters an order, a nearby driver receives a notification in their app. When the order appears, the driver only has a few seconds to decide whether to accept it before the order is offered to or accepted by another driver. Some drivers, therefore, have set their apps to auto-accept orders. This means that they may not first have a chance to see where the customer is going, or if the customer is paying digitally or with cash. These details are important to drivers and can affect the decision to accept an order or to cancel it in the event of an auto-accept. However, as one driver pointed out, the accessibility of this information differs between Grab and Gojek:

We can see [the details] easily. It's just that in Grab, the information is positioned quite eye-catching, at the top, so you don't have to scroll to the end. But in Gojek, the information is placed below, we need to scroll down first, if the address is too long then we have to scroll through to see...

[Interlocutor 7]

He goes on to explain that his solution when using the Gojek app is to reduce the font size, giving

space for more text on one screen, so that he can avoid spending precious seconds fumbling to scroll in the app before accepting. Whether using auto-accept, accepting due to feeling rushed and pressured, or due to a lack of access to all relevant information, there are many situations in which drivers may have to cancel an order even if it will negatively affect their completion rate.

Typically, drivers cancel because the order is inconvenient for them. For instance, the order may take them to a remote location where the likelihood of getting a return trip is low. Perhaps it is a long trip, and though the payment may be higher, it is still only worth one point, meaning that a driver chasing points might prefer several short trips. In some cases, drivers simply arrive to find that no customers are waiting for them. In Grab, the driver must wait for 10 minutes before the order is cancelled for them. But in Gojek, the only solution is for the driver to cancel the order. In some cases, drivers also depend on their 'gut instincts' about customers, choosing to cancel before picking them up if they don't feel comfortable with the order. As one driver put it:

It's the drivers who pay attention to the customers. If the customer is suspicious, we leave them. We don't bring them along.

[FGD 3]

When asked how they develop these instincts about a customer, drivers described using the integrated messaging system or making phone calls to the customer for clues. For instance, a common fear for drivers is what they call *order fiktif*, fictional orders or pranks, causing them to waste their time and resources. Customers making a booking with the cash payment option can be a risk factor for a prank order, and thus calling the customer on the phone, or communicating through the integrated messaging system helps the driver discern whether this is a person with genuine intentions. Another clue that will almost always lead to cancellation is if a customer is rushing. A passenger in a rush is almost always sure to lead to a negative customer rating due to factors beyond the driver's control such as traffic congestion. The long-term consequences of a bad rating are ultimately significantly worse than one cancelled trip. Furthermore, a rushing passenger might pressure a driver to take more risks, which could lead to vehicle or personal injury, not to mention that such a customer would simply be an unpleasant company, as one driver pointed out. After all, ojol are not taxi drivers in the conventional sense, they are free agents who should be able to choose who they work with.

Customers also cancel orders and this will not affect the 'performance rating' of the driver. Thus, I would frequently experience that drivers who had already accepted my order would call me on the phone requesting that I cancel the order. Clicking the 'cancel order' button in the Gojek app would cause a small box to appear, asking me if it was the driver that had asked for the cancellation, an example of how the technology develops in response to users creatively

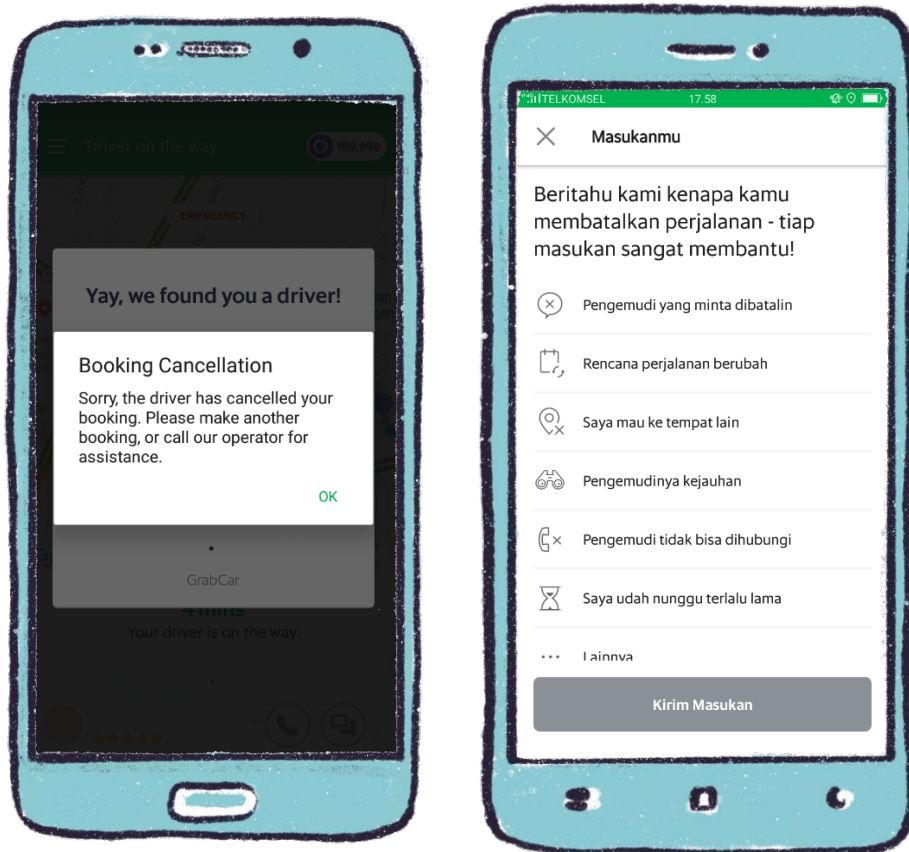
collaborating against the system. Ticking the box would cause the cancellation to affect their 'performance rating' as normal. One driver described a situation where he felt this option had been unfairly used against him, causing his rating to fall due to an issue outside of his control. He had gone to a restaurant to order food for a customer, only to find the restaurant was closed. He messaged the customer, asking them:

What do you want to do about it? [imitating customer] "Alright then just cancel it." [imitating himself] "Alright then YOU may cancel it." And it turned out they cancelled it as the driver's request. I wasn't doing anything wrong, right? What's wrong was, why was the restaurant closed but they were not closed in the app? You know? So, I think that Gojek is glorifying their customers, treating them like kings.

[Interlocutor 3]

Having spent time and fuel to travel to this restaurant, the only thing he got out of it, was a reduced completion rate and thus reduced income for the day. Completing food delivery orders is an important part of the online driver's work, and the exchange relation and infrastructural organisation between drivers, customers, restaurants, and the companies deserve scholarly attention of its own but is beyond the scope of this thesis.²⁸ For many drivers, digital payments provided security when completing food orders because they were guaranteed to be compensated for the cost of food. When customers placed food orders using cash payment, this would lead many drivers to react with caution due to fear of a 'fictive' order, in which drivers are pranked to accept deliveries without a customer waiting to receive and pay for their order. Here, the digital payment mechanism becomes a safeguard against customers with malicious intent. It is also a reminder of how it is the labour and cash of drivers that enable the seemingly automated and seamless digital order and payment experience for customers.

²⁸ During my fieldwork, some restaurants listed in the GoFood app were using a separate GoResto app facilitating automated food order and payment from customers. For restaurants without this app, it is the driver that receives the food order and then drives to the respective restaurant to place it manually. After waiting for the food to be prepared, they pay using their own cash, and then drive to deliver it to the customer where they are compensated for the food cost and receive the kilometre tariff payment. In their app, drivers can adjust the amount they are willing to spend up front to reduce risk, but this naturally affects how many orders they can receive.



Screenshot 13: Left, order cancelled by driver in Grab. Right, new Grab cancellation menu. 3 July 2018 and 14 April 2019, respectively.

By 2019, cancelling a booking as a customer in either Gojek or Grab came to involve an entire menu of options as can be seen in Screenshot 13. Here, the customer is asked to give a reason for the cancellation. The first reads; ‘The driver requested the cancellation’, others include plans changing, wanting to book a different route, the driver being too far away, the driver not being reachable by phone, or having waited too long for the driver to arrive. Accompanied by cute pictograms, these simple-looking options represent a minefield of unknowable consequences. Knowing the impact of reporting the driver for a cancellation request, what might the impact be of reporting them for taking too long or being unreachable? Might it impact the algorithmic governance, or down prioritize this driver for future order allocations? The text at the top of the menu reads; “Let us know why you are cancelling the trip – each entry is very helpful!”, but helpful to who, and in what way?

During fieldwork in 2018, it was not uncommon for drivers who had already accepted my booking to call me and ask me if I would be willing to take the trip ‘offline’. In effect, the customers and drivers conspire, so that the customer cancels the booking in the app, paying the driver the same amount of cash directly so that the driver can avoid owing the company their cut of the

transaction. As drivers navigate between chasing points and income from kilometre tariffs, this was a technique that could be deployed if the trip itself was considered more profitable than the value of the point it would earn, allowing them to optimise their income opportunities. Drivers referred to such strategies as, *mengakali system*: outsmarting or outmanoeuvring the digital system. In my interviews with industry representatives, it was clear that the companies were well aware that drivers were using the apps as offline booking mechanisms. By 2019 I found that drivers seldom asked to take the trip offline as the algorithmic value of completed online trips and the collection of points became increasingly important.

Enrolling the Customer

On a few occasions, I experienced customers use the feature of reporting the driver for requesting a cancellation as a form of penalising action. One evening, I was waiting with an interlocutor by the side of the road for a driver who had accepted my booking. On the map in the interface, the driver's car icon appeared close by but it never moved. After waiting for a while, and finding the driver unresponsive, my interlocutor suggested I cancel and report the driver for being *nakal*, meaning naughty, or duplicitous. She reasoned that the driver could communicate if they were delayed due to traffic and she would be empathetic. In this case, she felt that the driver was clearly manipulating the app regarding his position and she did not like it when drivers 'lie' which is why she would have reported him. Some drivers do use third party applications known as *titik tuyul*,²⁹ also called *ghost point* or *fake GPS* apps, which allow them to manipulate their position in the apps as one driver explained to me:

That's why it's called a tuyul application, a ghost application, because we're not actually there, but for instance, we're here. We put the point in front of Dunkin Donuts. If somebody ordered in front of Dunkin Donuts, automatically we're the closest.

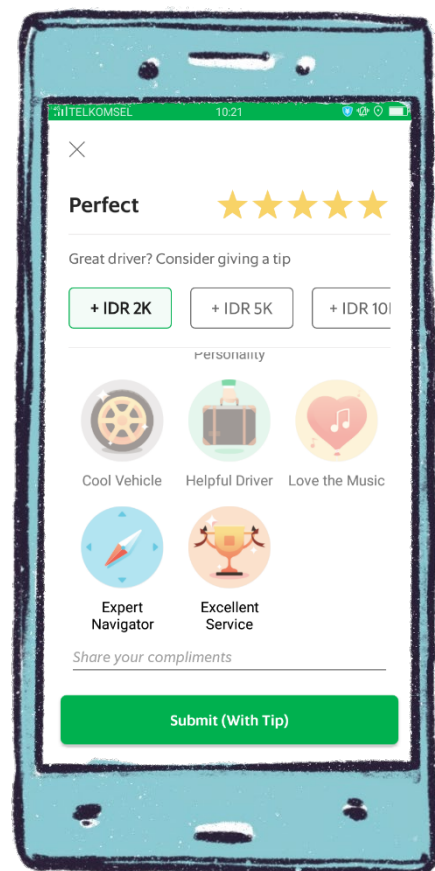
[Interlocutor 5]

While the driver waits at home, at a community base camp, or a nearby food stall, his digital ghost waits outside the popular international food chain which is more likely to attract the orders of consumer-cyborgs. For my interlocutor, finding herself engaging with the fake, unmoving, tuyul car icon in the app was a breach of her expectations of the relationship between the customer and

²⁹ The tuyul is a Javanese mythological creature also familiar in other parts of Southeast Asia. Summonable through black magic, the tuyul helps its owner by stealing value from others to make its owner rich quickly. It must be kept happy, or it can turn on you and cause problems. For drivers using *titik tuyul* or *fake GPS* apps could be seen as a way of regaining some control over their existence within the app, reclaiming GPS data and challenging the tracking of their movements. Use of such third-party apps violates the terms and conditions for drivers, and thus their use constitutes great risk.

the driver. The driver had 'chosen' to accept the trip and for whatever reason had now 'decided' not to complete the order, hoping perhaps that the customer would become impatient and cancel. She felt it was rude and the driver should be reported for manipulating the GPS and for wasting her time. It is a good reminder of how much power the customer wields over the driver and how the interface of the apps themselves enlist customers in reporting drivers for undesirable behaviour. What counts as desirable behaviour is determined by the company, but when engaging with the customer interface, the app communicates about the driver to passengers in various subtle ways. One example of this is when customers are asked to rate drivers after a completed trip.

There are of course valid reasons why customers should be able to report drivers for dangerous behaviours, but similarly to the cancellation menu, it is worth examining in more detail how these mechanisms both enrol customers to monitor and set up expectations for that behaviour. The customer is asked to rate their experience after the order is complete in both Grab and Gojek by awarding the driver up to 5 stars. Beneath the stars are additional clickable icons, providing subtle illustrations of what the designers of the app consider to be a 'cool vehicle', or indicating that a 'helpful driver' carries your luggage. When booking a trip, the customer does not select the driver – it is not possible to filter for 'cool vehicle' or drivers that have a 'great personality'. So, who is this information for and how does it impact the driver's account? Positioned there beneath the stars, the implication for the customer is that these are certain criteria attached to the star-based rating. Thus, besides informing on the driver, these illustrations contribute to developing expectations from the consumer-cyborgs about what a driver-partner is supposed to be.



Screenshot 14: Driver rating menu in Grab. 27 February 2019.

Furthermore, the distance between 1 and 5 stars is just a thumb swipe, but its implications for the driver is the difference between preferential algorithmic treatment or automatic suspension. Many rumours are circulating among drivers about what various ratings might mean, but it is worth nothing that I have never met a driver with less than a 4.5 rating, suggesting that they are simply filtered out. In practice, anything less than a perfect 5-star review will have a negative

impact on the driver account.

Drivers expressed how customers would rate them poorly for not appeasing their requests even if these fell outside of the expected terms set up by the app. For instance, requesting a different or longer route, demanding a stop at an ATM or corner shop, or indeed, expecting the driver to carry their luggage, all without offering any additional payment.

“Pity the driver who got one star,” [Interlocutor 8] one driver explained because it means the loss of access to the platform and thus, their livelihood. Or as another put it, “in terms of stars – back then, stars were absolute. If a driver gets one star, just once, they die, they can’t live anymore” [FGD 3]. For drivers, the star rating is experienced as a matter of the life and death of the driver account itself. Furthermore, it can affect a drivers access to earnings stored in the digital wallet. Asking one driver whether he considered it safe to store digital money in the digital wallet provided to drivers, he immediately responded *no*, describing his fear that if he were suspended all of his money would be ‘gone’:

It’s gone. For instance, I have 100,000 in my cash wallet. If I’m not in a hurry, I – why am I afraid, and I have to look for the ATM? Because I’m scared of getting suspended because of a customer who wants to mess things up. Why am I scared? Because I don’t work using my own account. I use my dad’s account, you know. That’s the thing I’m scared of man because I don’t work using my own account.

[FGD 3]

Because his face and car did not match those described in the app, each encounter with a customer included a much higher degree of risk than for those drivers using their own accounts. Always fearing suspension, he would constantly withdraw any balance for fear of losing his money, which he and the other drivers assumed would simply be ‘swallowed’ by the company when he lost access to the account. Other drivers shared similar accounts when I asked them about how much money they would typically store before withdrawing. One driver told me that he never stored more than 500,000 following an incident with his nephew where the company had indeed ‘swallowed’ his savings:

A: Because there was an incident – not my friend, but my nephew – who got suspended, meanwhile he still had 700,000 in his balance.

Q: So, he couldn’t get the money?

A: He couldn’t get it.

Q: Oh, because he got suspended?

A: Yes, he got suspended.

[Interlocutor 5]

For reasons that remained unclear, his nephew's account was suspended. Whether or not this was a fair suspension, the outcome was that he lost access to the earnings he stored in the digital wallet. Thus, he was doubly punished, losing access to the driver account which was his source of income, but also access to his own, significant, earnings. With the suspension, the company simply withheld his money by cutting off his access to the account. After several attempts to reverse the suspension at the company office, and without any clear reason why this was not possible, the nephew gave up and registered a new account through one of his parents.

While a negative rating and suspension can be disastrous for a driver, the seconds spent on a rating seem much less consequential for a customer. Some customers described giving drivers 3-star ratings generally unless they felt the experience had been exceptional. There is no ill intent here, the customer was applying the evaluative logic suggested by the interface without knowing the potentially disastrous consequences for the driver. Others, more aware of the impact, expressed that they would consistently give 5-star ratings irrespective of their experience. In practice, enacting a form of solidarity with the drivers while also undermining the purpose of the rating mechanism at all. Drivers go to great lengths to secure good ratings, making candies, tissues, and bottled water available for their passengers, requesting that you not report them for using a borrowed account and double-checking that you have not left any belongings after a trip. For driver-partners, the rating mechanism becomes an additional transactional element requiring additional relational labour to maintain a good relationship with the consumer-cyborg. One driver explained how all of these unequal conditions led customers to view him as a throw-away driver that they could treat without consideration, which in turn made him feel increasingly removed from them as an actual person in the exchange:

Sometimes people have less empathy. They think that drivers are...since they have already paid them, they can do whatever they want. They don't even think. The drivers' income comes from the customers, not from a salary. But the price is so cheap, they don't think – they think that these drivers are just robots, who don't need to feed their wives and children. It's so cheap that they take it for granted.

[Interlocutor 6]

The overall effect is one in which the driver-partner is viewed and treated as an extended and automated part of the infrastructure servicing the consumer-cyborgs who can now hire their own on-demand servants. When ratings and trip cancellations are taken together with the increasing tier value of points, drivers are faced with a complex value and risk assessment. Continuing to drive after successfully reaching the first or even second bonus tier presents a gamble. The final points are worth more, but it comes with an increased risk of cancellations, especially towards the

final hours of the day. Continuing to drive may lead to a significantly higher bonus but it may also cause you to lose everything. Unfairly, it is not always within the control of a driver whether a trip should be cancelled, sometimes there are still good and strategic reasons for doing so. Meanwhile, 'debt trips' force drivers to continue circulating through the city while their bonuses are effectively held hostage by the app. For drivers, point-chasing is a critical part of the job, and for many, there is an equivalence between money earned from trip fees and hard-earned points as their own form of money. However, as one interlocutor pointed out if you fail to materialise it, either due to your performance rating or being one point shy of the next tier, then the money disappears at midnight when the system resets. Meanwhile, the app interfaces enrol the customer in the monitoring and control of the driver, positioning them in a hierarchical relationship, rather than as equal parties in an exchange.



Illustration 4: Fretting about customer ratings.

5.3 Account Intermediaries

In this section, I will focus on a specific case of an intermediating infrastructure positioned

somewhere within the P2P acronym: the account vendors for GoCar drivers.³⁰ I first became aware of the existence of account vendors when drivers declined to top-up my account by telling me that they were “with a vendor.” In an interview, I asked the head of one of Jogja’s many driver communities about this. He explained that the reason they cannot sell GoPay is that “there is no money.” I would later come to understand that the reason that ‘there is no money’ to sell is that the digital money is held by the vendor, not the driver. This realisation raised a lot of questions. What is a vendor? Who are they? Why do people use them? Why do they control the money? And what is their infrastructural connection to both the company and the driver?

Throughout my fieldwork I tried to set up an interview with an account vendor, asking drivers if they would connect me and visiting addresses that I was given but often encountering closed doors and dead ends. Finally, just before leaving Jogja, I was able to interview two people employed by an account vendor. This section draws on this interview, as well as perspectives from the drivers themselves. Account vendors are an interesting practical example of intermediation taking place at the intersection of the so-called gig economy and digital payments beyond the companies providing the platform. Their role goes beyond control over digital money and into more actively managing the driver fleet. The vendor’s presence in this digital payments ecosystem also complicates the common narratives about intermediation within P2P payments, in which ‘removing the middle-man’ is presented as being always desirable. Rather than assess whether their intermediation of digital payments and relation to drivers is inherently positive or negative, I will particularise their role and show how they contribute to the configuration of driver-partners.

‘Corporate’ and ‘Vendor’ Accounts

As mentioned earlier, there are two different ways to have an account for car drivers: a ‘corporate’ account and a ‘vendor’ account. Corporate accounts are those registered directly with the company, but as registration for corporate accounts in Jogja closed in 2018 drivers were left with only one way to register for a new account, namely through a vendor, until this option also closed in 2019. The vendor employees that I spoke with estimated that between 30-40 vendors were operating in Jogja, which correlated with similar numbers I had heard from drivers. Of these, only about 5-6 had fleets numbering in the hundreds of drivers. This vendor had between 400 to 500

³⁰ At the time of my fieldwork, I never encountered a ‘vendor’ equivalent for Grab accounts. At times, drivers would refer to Grab ‘co-ops’ occasionally suggesting they served a similar purpose, but unfortunately I was unable to find more information about this. Similarly, at the time of my research there were no vendors for Gojek motorcycle drivers, meaning that the account vendors described here were exclusively relevant for GoCar drivers.

registered drivers of which just over half were defined as 'active'. When I asked the employees what a vendor does, they described two main roles:

1. Recruitment of drivers and management of accounts
2. Providing a bridge between drivers and the company

According to the vendor employees, "[Gojek] made vendors to help the driver recruitment process", relying on the local network and relationships of a vendor to facilitate the recruitment of new drivers onto the platform. The vendor handled registration, validating documents, and updating driver accounts. As the Gojek platform developed and digital payments were incorporated, vendors also became responsible for managing digital earnings for their drivers. To manage this, the vendor is equipped with their own app through which they can generate driver accounts.³¹ Their second function is to act as a bridge between the company and the drivers, theoretically providing a channel of communication for disseminating rule changes or other company updates, handling driver complaints, or helping drivers present their cases to the company in case of any issues. As before, this dynamic too has changed as the Gojek platform has developed, and the vendor employees expressed frustration that this part of their job had become more difficult. One employee explained:

But nowadays, it's different with the rules. Like the authority that a vendor has is not as much as back then. Back then, as the admins in the past had said, helping drivers was easier, not as difficult as now. So, the procedure from Gojek is a little bit rigid.

[Vendor Employees]

Not only was the vendor's authority and capacity to help driver's decreased, but they found that increasingly they relied on drivers to inform the vendor about updates. While they supposedly acted as a bridge for the company to provide information to the drivers, the vendor employees explained that in practice they gained information firstly from the drivers. The vendor would then seek verification from the company to make a formal announcement to their fleet through their various WhatsApp groups. The vendor employees point out that there is a misalignment between the expectations the drivers have of the vendor's power to resolve problems. Whilst vendors try to help drivers with documents via the phone, or even at the Gojek office, in practice, they do not have very much authority or power to resolve other issues. This has led some drivers to question their value. One of the employees quotes a driver who came to the office in frustration: "what is

³¹ Unfortunately I was not given the opportunity to see this app so I cannot offer any further details about its functions.

the point of having a vendor anyways? What can you even do?"

For drivers, registering with a vendor comes with certain benefits and conditions. It is firstly easier to register with a vendor than directly with the company via WhatsApp messages. By submitting photographs of your documents and your car you may be able to start driving the very next day. In contrast, registering at the Gojek office was sometimes described as having to bring all your formal documents and then "wait in line from morning to afternoon." Secondly, there are simply fewer requirements for registering with a vendor than there are for registering directly with Gojek. While Gojek has strict requirements about the age, type and engine capacity of a vehicle, smaller and older cars are accepted for registration by vendors along with license plates from outside Jogja. Gojek also requires drivers to have what was described to me as an 'all-risk' insurance, which they must get through another third-party insurance company. The 'applicators' are not stupid, the head of the driver community told me, referring to the companies, they understand how dangerous it is to work as a driver and they want to ensure that drivers are insured in the event of any accidents. Meanwhile, vendors do not require drivers to have any insurance which also makes it a more affordable option for many.

The ease of registration with a vendor and WhatsApp-based communication also makes it easy for vendors to make changes to a drivers account, such as license plates, phone numbers, or even a driver's name. As a customer, one clue that your driver is operating through a vendor is when the information provided in the app is incomplete, seen in Screenshot 15. This ability to be flexible was also highlighted by the vendor employees:

For us, whether the car is being inputted or not, or being changed or not. We can do it anytime. In the office, you can't do it. Bank accounts as well. Maybe you want to change it with your wife's account, or like you mentioned before, there's rent or buy and sell out there, it's easier. We can do it anytime.

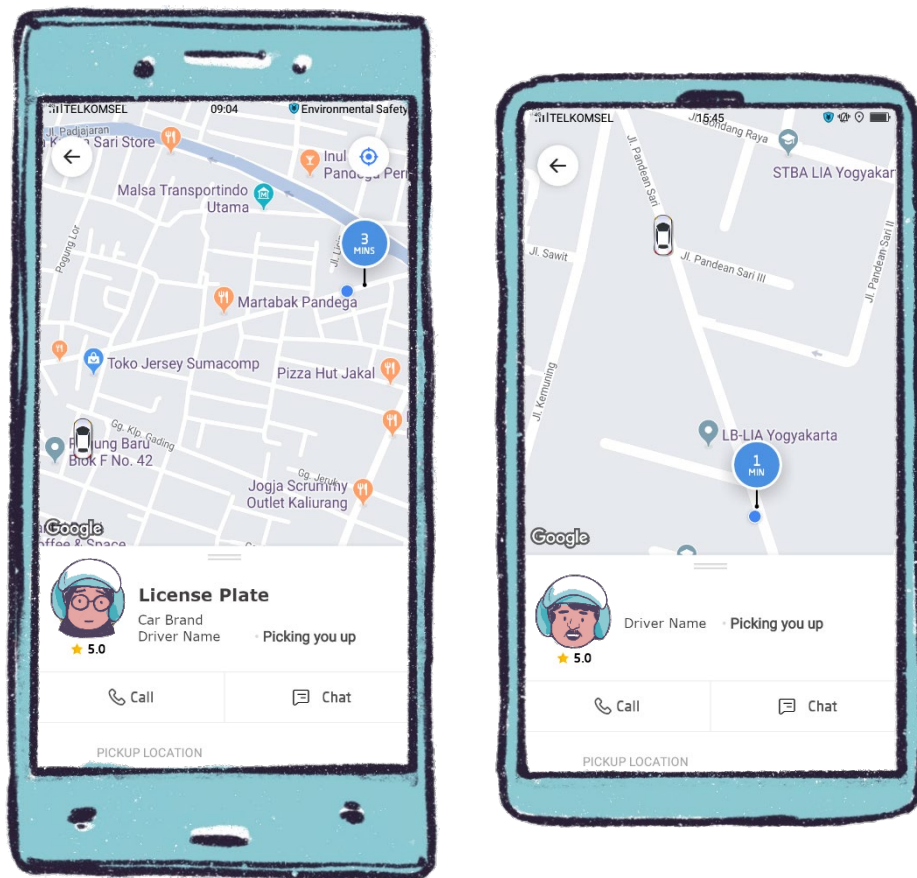
[Vendor Employees]

Finally, the vendor does provide certain services for the drivers in relation to the company. Some examples given by drivers included situations where they had been suspended due to negative ratings or being accidentally locked out of an account. Ordinarily, the driver would have to go to the Gojek office, but with a vendor there is someone to champion your cause and even resolve issues for you. This is what the vendor employees expressed frustration about, as they found their authority to solve problems for drivers diminishing over time, as the power centralised with the company so that their efforts to help had limited outcome. In exchange for the benefits offered by a vendor, drivers accept three conditions:

1. Not being able to sell their GoPay balance.

2. Paying fees.
3. Not having control over their digital wallets.

While all vendors essentially provide these same services, the difference lies in the size of the fee and how they charge. The most common model I encountered involves paying a registration fee of approximately Rp 150,000, followed by a 5 per cent cut on every transfer of digital balance. Notably, they do not charge on income from cash transactions. The size of the vendor cut varies and some vendors opt for a fixed daily or weekly rate of between Rp 35-50,000 instead which is deducted from the balance.



*Screenshot 15: Complete and incomplete driver information.
To the left, 5 March 2019. To the right, 3 March 2019.*

Account Control and Access to Earnings

If vendor drivers are unable to top-up accounts because they do not control their money, where is the money stored exactly? Mondays through Fridays, between 10 am and 3 pm, the vendor employees are particularly busy making withdrawals and transfers. They told me that the time window is imposed by the app provided by Gojek, so the employees must work quickly to ensure that all daily withdrawals and transfers are completed. With an estimated 250 active drivers requiring daily transfers within a 5-hour window, the two employees only have about 2.5 minutes

each per driver. They described the following process:

The app which Gojek provides to the vendor includes every driver that the vendor has registered. The vendor employees use it to access the driver's digital balance which comprises both earnings from completed trips and the daily bonus. The employees then withdraw this money to the vendors' bank account, calculate the reduction from their 5 per cent cut, and make a manual bank transfer to the driver with the remainder.

So we have to calculate it manually with a calculator, we have to input it in Excel first, and then we input it in the internet banking app, copy-pasting the name or the account, like that.

[Vendor Employees]

It is an extraordinary level of intermediation for a form of financial service that purports to be about removing the middleman making payments hassle-free and giving more agency to the unbanked through access to the digital economy. Instead, vendor drivers find themselves as users of a digital payment system over which they have very little control. Not only are they unable to sell their balance to customers, but they must also rely on the vendor to make the daily bank transfer in an accurate and timely manner. While drivers may benefit from digital payments, and as many expressed that they enjoy cashless transactions, in this instance the driver does not control the flow of their digital wallet. The existence of the digital wallet mainly serves the purpose of enabling passengers to make cashless transactions, after which the burden is once again on the driver to materialise their earnings as cash.

Besides the app, the most important tools for the vendor are thus the little physical 'token' which helps generate PINs for the bank transfers and the driver database they have developed using Microsoft Excel. Here they keep track of every registered driver, including license plate numbers, contact details, and any other document requirements from Gojek. Critically, they also contain the connected bank account numbers, colour coded to indicate which bank a driver uses. Drivers are also colour coded according to their status with Gojek, whether they are active, currently suspended or PM'd, or *putus mitra*, meaning that their partnership agreement has been broken by the company due to driver violations. This arrangement means that the employees often make accidental transfers which must be corrected. If they send too little or too late, drivers are quick to reach out to have the mistake corrected. But if they send too much or to the wrong person, it is their own responsibility to get the money back. Typically, they rely on the contact information that they have stored in WhatsApp drawn from the database. In most cases they explained, drivers are helpful and quick to resolve the issue. However, as drivers change numbers frequently, it can be challenging to reach them. One employee joked about their frustrations with keeping track of

drivers:

See, if we have to keep an eye on some drivers it's impossible if they changed numbers, so automatically they're the ones who have to tell us first. If they don't need us, then we're not looking for them. [Laughter]

[Vendor Employees]

The relationship between vendor and driver is described as professional, and while there is a little bench in the corner of the office, this is not a place where drivers are invited to hang out. For the most part communication with the vendor takes place via WhatsApp. Occasionally drivers will turn up to the office typically when frustrated or angry with not having received payments. It happens often, the employees explain to me, though usually, this extreme situation has to do with an error from the Gojek company where a driver is inadvertently registered as a vendor account by the company rather than a corporate account, and thus is not receiving payments as expected. The rhythm and timing of vendor transfers is an ongoing challenge for drivers as well. When I asked one driver to explain to me the difference between a vendor and a corporate account, he summarised by saying that drivers with a corporate account can withdraw at any time, but that vendor accounts depend on transfers which come with a delay.

Meanwhile, we're in the streets, and we need at least 200,000 in order to begin. Meanwhile the customers are paying with GoPay, and in the meantime, we can't take [withdraw] it and we have to wait until the next day at 1 PM in order to get it. That's the weakness.

[Interlocutor 3]

Particularly during the weekend when the vendor is closed, this delay causes problems for drivers who continue to have expenses for food, fuel, and often instalments for their cars. The delay and lack of access to one's own account was such a significant problem for many drivers that at a protest in March 2019 several had resigned, or expressed their desire to do so, from vendors, demanding instead to be absorbed as fully equal corporate drivers by Gojek.

Ultimately, drivers accept the conditions imposed by a vendor account because though they are disadvantaged, they still depend on the opportunity for access to income. For vendor drivers, the priority is to work no matter what to provide for themselves and their families. As discussed earlier, despite recent economic growth in Indonesia there are also increasing disparities of income and wealth. Oxfam reported the minimum wage in Jogja is too low to cover the average monthly household expenses (Gibson, 2017). For many drivers, the opportunity of having access to income of any amount is valuable. These companies exploit these structural inequalities to ensure a continual supply of driver-partners, continually changing the labour conditions, making

it ever more difficult to survive on the platform. Furthermore, the creation of two distinct categories of driver – corporate and vendor – creates two tiers of labourer, one of which will always be structurally disadvantaged.

The Ambiguous Work of Vendors

Throughout my fieldwork, I continued to struggle to understand exactly the relationship between Gojek and vendors. They were equipped with technology by the company and held a specific position of authority and responsibility in relation to the drivers. Yet it seemed strange to me that the company would impose restrictions on registrations, such as ensuring safer vehicles and insurances and accept less from those drivers relying on vendors. In our interview, the head of the driver community expressed a similar concern over the ease with which vendors could ‘edit’ driver information via WhatsApp. He felt this posed a significant risk for the customers: “according to me, it is dangerous for the customers, since the A driver should be replaced by B. Like what if they get kidnapped, robbed... that is the difference with vendors. The customers should be sharp about it”. It seemed incongruous to me that Gojek would accept these circumstances and knowingly retain this double standard between the driver categories.

Hoping to develop a clearer understanding, I interviewed an industry representative in 2018 who stressed that this was an area of continuous regulatory fluctuation. In practice, the vendor system could be understood as an outcome of a government requirement for the establishment of a third party. This way, the ride-hailing app model would more closely resemble that of conventional taxi companies where drivers are affiliated with an entity rather than being ‘self-employed’. Notably, almost without exception, when asking drivers the same question, they reasoned that the closure of corporate account registration had been the result of driver saturation rather than being the outcome of a legal compromise. However, one driver summarised the relationship between driver, vendor, and company in a way that aligns with the suggested legal requirements. He said that all drivers must be registered with a company and so online drivers pay a vendor to be a part of the company the vendor establishes, and which then collaborates with Gojek. Not employees or partners, but users paying for access to a platform through a third party. Whatever the reason for their establishment, the facts of their existence seemed to be an example of unclear communication between the company and their driver-partners, and neither reason explains why it is the vendors that control the driver’s digital wallet.

The very first time I encountered the concept of an account vendor was in the context of a driver who had been directed to one by the local Gojek branch, and whose story of returning to Jogja to care for his ailing mother I shared earlier. In 2018, the Gojek head office in Jakarta told him to

apply at the local branch office instead, where he was then directed to a local vendor for registration. His visit there led him to decide to switch to the competitor Grab instead. Asked to characterise vendors for me, he chose to describe them as a 'multi-level marketing scheme'. In this system, he explained, senior drivers with good ratings were tapped by Gojek to become account vendors. They would then seek out other drivers to work under them, helping them with registration and setting up accounts for them within the vendor's account. He explained, "that's how it goes. But later on, from your withdrawal, from your bonus, you will be deducted 5 per cent for [the vendor]" [Interlocutor 1]. Several other drivers similarly described being directed immediately to a vendor through the local Gojek office. Others found vendors through friends and word-of-mouth, or through one of the many Facebook marketing campaigns that vendors deploy. The aforementioned driver proceeded to describe what he felt was a coordinated effort between Gojek and vendors. Benefiting both parties but disadvantaging drivers the aforementioned driver referred to the system as a 'mafia' operation: "well, mafia means, they tell us no more openings for GoCar drivers, but we can still register or apply through a vendor. If we register or apply through the vendor, there will be an extra deduction, and the vendor will get the advantage" [Interlocutor 1]. Not only did Gojek accept the lesser standards, but they also actively directed drivers to the vendors. In seeking to understand the intricacies of this intermediation, it continued to be difficult to get clear answers from anyone; drivers, vendors, or even the company itself. One driver made the point explicitly that I should not expect to conduct such an interview:

There are a lot of vendors here, but they are quite difficult to interview. Because they want to keep things secret. Even if this or that happened, they do not want to know. [Imitating a vendor] 'Ah, for what do you care so much about that?'

[Interlocutor 3]

Aligning with the perception of vendors as a 'mafia' operation, this driver went even further. He implied that not only did vendors earn fees from drivers but they were also rewarded financially by Gojek if their fleet was 'well behaved', securing more earnings for the company. He also insinuated that there was some nepotism involved in achieving 'vendor' status, thus echoing what many other drivers had also mentioned in passing:

A: Maybe I'd say, there is a partnership between vendors and the company. So, it's like, the vendor would also get, if the driver is good and they earn well, the vendor would also get a fee from Gojek. So, there are two [incomes].

Q: They get fees from drivers and from Gojek as well?

A: That's why a lot of vendors are competing to be vendors. And not all people can make vendors. Without any connections from within.

[Interlocutor 3]

Furthermore, he suggested that vendors could be penalised or be closed by Gojek if, for example, more than 20 per cent of the driver fleet committed errors leading to suspension or broken partnerships. If such mechanisms do indeed exist, this would incentivise vendors to police their own fleets to adhere to company policy, extending the reach of the company beyond what would otherwise have been possible, doing the work of configuration beyond the app itself. In my interview with the vendor employees, there was no mention of such financial incentives between the vendor and the company. The many speculative narratives I encountered from drivers surrounding the Gojek-vendor constellation is perhaps indicative of an even deeper misalignment of expectations between drivers and the technology they depend on. The platform is expected to make things easier, to give the drivers more agency and control. The digital wallet is supposed to make it easier to access and use your digital money, the interfaces, and the many dashboards about points and performance ratings are supposed to make things more visible rather than less. For the drivers, this, and the language of partnership, generates unrealistic expectations of transparency, and encountering these inconsistencies in practice such as with the vendor system, they become suspicious of the underlying infrastructures and power dynamics.

The many theories about how and why accounts do or do not work, speak to the knowledge asymmetry between app users and developers. Drivers would frequently point out the perceived discrepancy in education levels or talk about ‘those IT people’ who, unlike drivers, are employed by the company. One such theory pertains to what drivers see as frequent and unfair suspensions. One driver claimed that over the years, drivers are bound to make ‘mistakes’ and when they have profited for too long on the platform the company will use the smallest error as an excuse to suspend their account so they can ‘regenerate’ it. At the time, his meaning was lost on me, until another driver shared a similar theory. According to him, employees at the company would suspend drivers to lock them out of their accounts and then resell these accounts on the account market through Facebook or WhatsApp groups. I have seen no evidence of such practices, but the insistence with which such stories were shared to me by drivers communicates the mistrust that drivers feel towards the platform, specifically the people creating the technology.

Whether they receive additional financial incentives or not, vendors benefit from drivers being successful users of the platform, and particularly being successful recipients of digital payments, as their income stems from the cut of the digital balance transferred each day. Vendors perform a function of both ‘socialising’ and chastising drivers to behave in ways that benefit both vendors and the company. One older driver, a retired bank employee, spoke with me shortly after having joined a vendor. He detailed how he would make frequent calls to the vendor office at the beginning with questions about how to operate the app and would be taught things such as the

practice of calling the customer on the phone after a booking to confirm the veracity of an order: “they told me about that, so I was completely blank. I knew nothing [laughs].” [Interlocutor 9]

The vendor was teaching him how to navigate not just the app, but how to implement behaviours beyond those suggested by the app interface. In another instance, I continued to meet the same driver, each time in a different vehicle. Neither his name nor face matched that of the app, and of course, neither did the license plates. He eventually explained that the account belonged to a relative while the cars belonged to the account vendor. One of them notably contained an information placard for the customer, depicted in Figure 16, including a list of available customer services such as the anti-bac gel, candies, and radio, while also pleading with the customer not to report the driver should either face or vehicle not match the registered driver in the app.

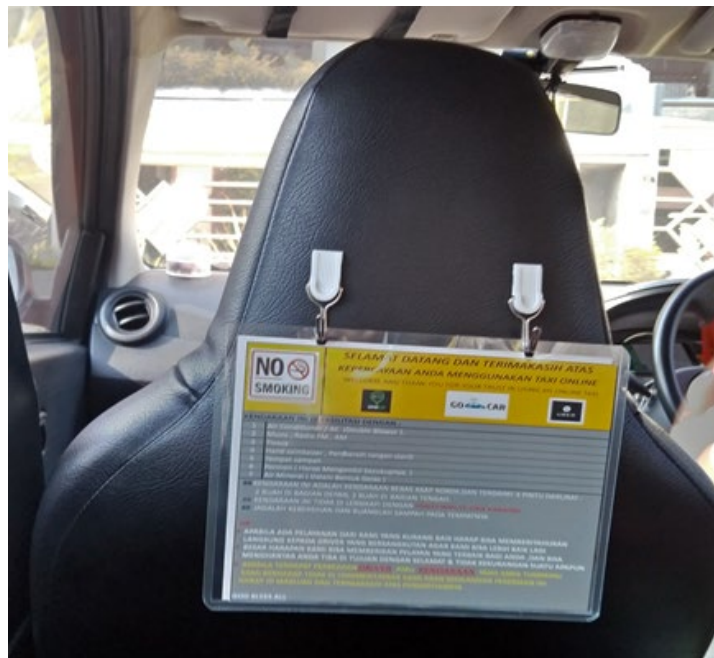


Figure 16: Vendor placard for customers – notably containing the logos of Grab, GoCar and Uber.

Another example of vendor communication that blurs the impression of whose interests they serve is a Facebook post made by one of Jogja’s larger vendors. Following driver protests in March 2019, drivers began to experience a crackdown on accounts suspected of violating the terms and conditions of the app. On the 10th of April, this vendor posted the following message to its drivers:

Important Information

In the last few days, there have been many suspensions or PM [putus mitra – driver partnership annulment] in many cities... In Jogja an estimated 1000 or more drivers have been PM’ed.

The main cause seems to be Fake Orders aka Dor2an...

We urge all [vendor] partners not to do things that can disadvantage

themselves.

Love your account...because there are no more openings for registration.

Honesty in work is the key...

As much as you can outsmart the system, the company has a Special Team that works day and night to deal with this problem... And they are people who are experts in IT...

So my advice... don't try it... the results are fatal...

Salama life forever

The message begins in an informative way, notifying drivers of what seems to be a crackdown on practices of 'cheating' the app with fake orders, which can lead to a driver's account being closed. It goes on in a more moral tone, reminding drivers of both the importance of honesty in work and the precarity and preciousness of their accounts which can be forever lost. Finally, it implies that the company deploys a team of 'IT experts' that cannot be outwitted by drivers, implying that there will be severe, fatal in fact, punishment to those who choose to operate outside the bounds proposed by the company. The language emphasises the distance between drivers and the company and its technology, almost to the point of deification: the app will see you if you misbehave and it will punish you or reward you if you just love your account and treat it with veneration.

5.4 Hierarchies of Servitude

On the way to an interview on Saturday the 9th of March 2019, my driver casually asked me if I had been able to catch any rides the preceding day. It was an unusual question and as it happened I had not needed to order any rides. Well, the driver confidently explained, I would have been unsuccessful because 100 per cent of Jogja's online drivers had been taking part in a strike. He explained that the drivers had initiated the protest as a response to changes made to the Gojek driver app earlier that week. This event came to be a central point of orientation for my second round of fieldwork as it changed the core dynamics of the labour conditions that the drivers were working under. In the time that followed, drivers would express great frustration, and more frequently would complain to me about 'the system', telling me "the system doesn't wanna know". 'The system' is the answer that drivers would get when they called the revealingly named 'customer service', their access point to the companies. As one interlocutor explained after calling customer service to resolve what he assumed was an error causing his account not to be assigned any customer orders. They told him that the system was working just fine and that his account was registered as active and online. We were standing by the side of a road as he shared his story, and he kicked a tuft of grass in frustration saying sarcastically "*sistem-sistem itu... kami bisa heran saja*": those systems... we can only be astounded. Astounded perhaps by the inconsistencies of

their personal experience and the lack of engagement from the company. Astounded at the ease with which their problems could be dismissed as being 'the system', the conditions of which they had accepted when registering to use the platform. Thus, drivers were left to wonder if the system is working just fine, then how is it working, and who is it working for?

In this section, I first describe the events surrounding the system change: what happened, how drivers understood and received it, and how the company tried to present it. I continue by examining how it changed the working conditions for drivers, and how it introduced new hierarchies among drivers whose labour was now valued and financially compensated in a fundamentally unequal way. These inequalities become justified through the same logics of 'productivity' through which some drivers are deemed 'lazy' and others 'diligent'. Moral judgments become codified into the very platform infrastructure that governs their access to work and income. I show how drivers developed strategies to adapt to these new conditions, but how this also results in drivers having to engage in additional labour just to be able to do their main job, which is to be online and available for customer orders.

The Introduction of Multiple Scales

The first week of March 2019, Gojek introduced a new incentive bonus system for car drivers worsening conditions for their labour. It is not uncommon for the apps to adjust the number of points required, or the value of the bonus. This time Gojek both lowered the standard kilometre tariff and, more critically, replaced the standard 3-tier bonus scale with a system using four different scales known as *Skema's* A, B, C, and D. Briefly, Skema A required fewer points per tier but also reduced the maximum bonus, whereas Skema D required more points but gave the highest maximum bonus. For drivers, working conditions and income opportunities had radically changed overnight with little warning beyond an in-app notification of the change.

One interlocutor described how she discovered the change at the end of the first day with the new system. Having worked as an online driver for 3 years and as a formal taxi driver before that, she had an established routine and always managed to close with the 18 points required for the maximum bonus. She described her shock at the end of the first day when she received only Rp 120,000 as a bonus rather than the usual Rp 300,000, despite completing her regular hours. Assuming it was a mistake, she tried to call the Gojek 'Customer Service' the driver contact point to the company besides the local branch office, which reveals the status of driver-partners as 'customers' of the app. Her call was to no avail. However, as the days progressed, she found she would drive from 10 in the morning to 5 in the afternoon and still only manage to complete 12 rides. She described the 4 Skema's and their required points as follows:

Skema A	4 – 8 – 10	Skema B	6 – 10 – 12
Skema C	10 – 15 – 18	Skema D	12 – 16 – 20

Though it might be easier with only needing 10 points for Skema A, the resulting bonus is also substantially less than that earned with Skema D. The driver herself experienced this when the new system placed her in the Skema B category earning less than half of what she was used to. Asking her how she had felt about the change, she shrugged and responded “*Yah gimana... mau bilang dicurangi*”: Well how...I want to say cheated. *Dicurangi*, the implication here being that the system is rigged or unfairly set up against drivers *cheating* them out of their income. By the time that we met, the new system had been in place for over a month and despite the difficult start, her account now had the best Skema, Skema D, and she was back to earning a Rp 300,000 daily bonus. However, she still feels frustrated by the new changes and the response to driver complaints that came from the company. When talking with ‘Customer Support’, she claims they always tell her that it is ‘the system’, the underlying digital technology, “*sistem, selalu sistem, alasanya sistem*”: the system, always the system, the reason is the system.

Throughout my interviews and conversations with drivers, I received inconsistent numbers for both tiers and corresponding financial reward when they described these Skema. I spent a lot of time trying to find the ‘correct’ numbers to verify which numbers were accurate. However, after a multitude of Gojek blog documents, driver blogs, social media posts and community YouTube videos I have had to discontinue the search. There exist a multitude of different Skema’s all of which differ according to city, vehicle type, and sometimes even weekday. Furthermore, given the frequency with which these systems change, it is almost impossible to verify exactly when a given tier scale would have been valid. What I describe here has probably long since been replaced. Ultimately, what matters is not the exact numbers but the mechanics that using multiple Skema introduced. When reviewing my material from fieldwork, it struck me that the drivers were consistent only when describing the values for the best Skema, the uncertainties came when asked to describe Skema’s A-C. Similar to my experience that I never received a driver with a low star rating, I cannot help but wonder if perhaps I was more often being assigned drivers who had ‘earned’ the best Skema.

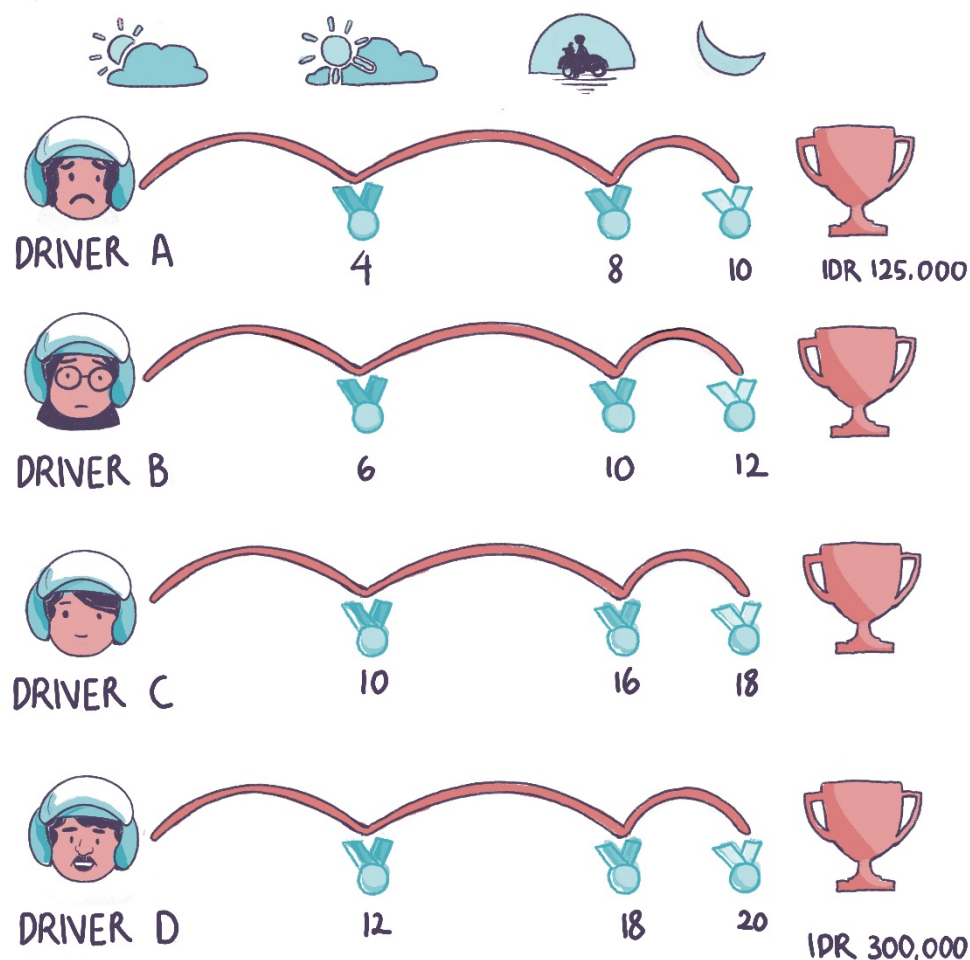


Illustration 5: Differentiated income opportunities with the new Skema.

This was not the first time that drivers experienced changes in the governance and income mechanisms for these apps. However, this time it caused the local Jogja driver communities to organise and take direct action in collaboration with account vendors. Through various social media platforms, all online drivers in Jogja, irrespective of platform company or type of vehicle were encouraged to set their apps to *offbid*, meaning that they were not accepting orders for the entire day. Beyond simply protesting, the act of being *offbid* is a targeted way of disconnecting from the driver-partner role as an infrastructural extension, rendering themselves unavailable for servicing the consumer-cyborgs. Instead, they congregated in front of the Gojek branch office to protest, where a few spokespeople were allowed to discuss the situation with local Gojek management. They submitted and later circulated on social media their three central demands to Gojek:

1. Lift account suspensions and address unfair partnership agreement annulments (when a driver is PM'd).

2. Implement a more fair and equal system for the distribution of orders.
3. Return to the old tariff and incentive point system.

Calls were also made for a general review of the conditions for the partnership agreement between company and drivers, and some drivers advocated for the absorption of all vendor drivers as full corporate drivers to address the inequalities stemming from the segregated system. Financially dependent on the digital earnings of drivers, vendors too participated in the demonstration. The employees I interviewed conveyed that the vendor himself not only participated but had actively contributed to its organisation with his insights and network.

At a press conference, the same day at the 4-star Hotel Santika Premiere Jogja, representatives from Gojek introduced the changes to the media arguing that the new system reflected the need for greater 'equalisation' in how the company had been 'subsidising' driver income through high tariffs and incentives. Michael Say, Gojek Vice President of Corporate Affairs, was quoted in the media as saying:

"So, in making decisions, we must protect three things, firstly empowering partners, consumer demand, and the sustainability of the industrial ecosystem itself. All three must be balanced." (Nugroho, 2019 translated from Bahasa Indonesia)

Gojek, like so many other online transport companies, had spent a lot of money on keeping consumer prices low to encourage people to use the app and to gain market dominance over its competitors. Now, as the app was gaining a broad usership and the fleet of drivers was growing, measures had to be put in place to reduce the costs for the company. Or in other words, to place the burden of making the app financially 'sustainable' while still appealing to consumer-cyborgs, onto its driver-partners while framing it in terms of 'empowerment'.

The drivers returned to being *onbid* the next day, but with no changes coming from the company, protests continued well into April with some drivers even initiating a hunger strike outside the branch (Lufityanti, 2019). Rumours started circulating amongst drivers I spoke with that Gojek was hiring *preman*, thugs, to break up the demonstrations. As things continued to escalate, Gojek eventually responded by simply closing the branch office 'temporarily' on the 12th of August. This was a double punishment because drivers often need to go to the office to issue complaints, to argue about an unfair suspension or rating, or to hand in a food order that they have been unable to deliver to get financial compensation. With the local Jogja office closed, the nearest branch office was in the neighbouring city of Surakarta, known locally as Solo, which is over 60 kilometres away (JoSS.co.id, 2019). Though the local Gojek office has since reopened in a different location in southern Jogja, this response from the company was still a reminder about the distance and power

difference that exists between the company and their driver and the paucity of the 'partner' title as the app continues to prioritise the needs of their customers.

Always Diligent, Always OnBid

In the aftermath of the initial protests, I talked to many drivers about what had motivated them to participate. Describing how the issue at stake was the new Skema system, one driver told me that they had to have a demonstration because "there are a lot of questions," reflecting the lack of communication and transparency drivers experienced from Gojek. Firstly, how were these new Skema allocated and why did some drivers find themselves structurally prevented from earning as much as their peers? The driver described how he had met with his colleagues following the implementation of the new system to compare their accounts. If someone suddenly found themselves on lower-earning Skema's, they would analyse which recent behaviours might have impacted their accounts to understand the underlying system. According to him, this allowed them to see what types of action led the algorithm to assign either 'good' or 'bad' Skemas:

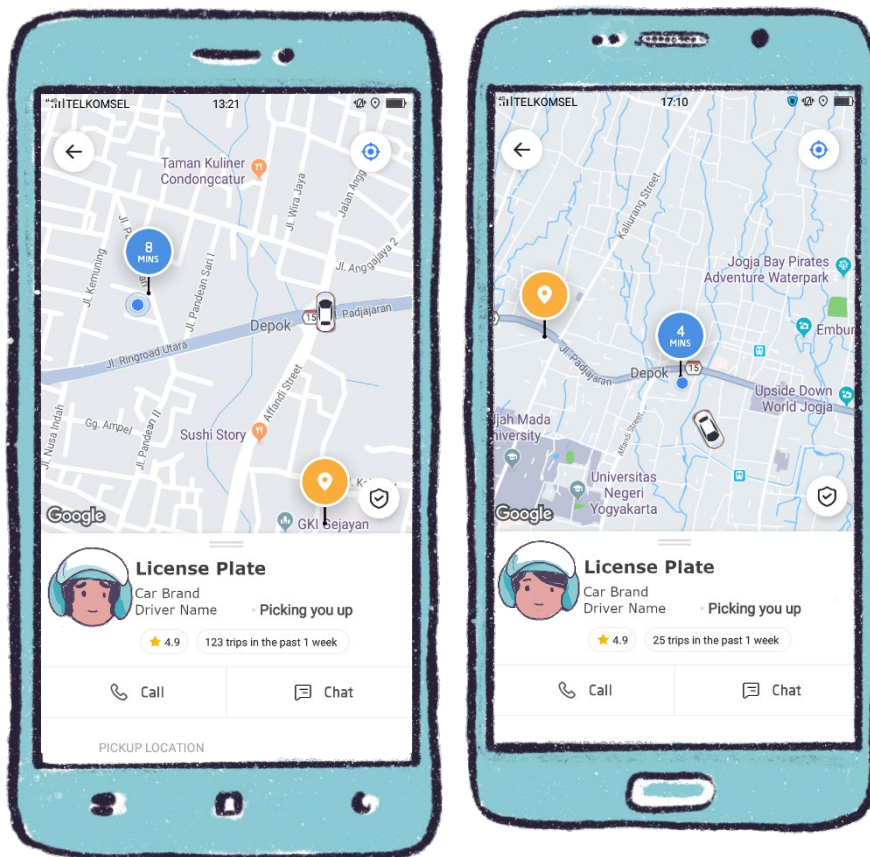
What A and B [two different drivers] had done was the same. So that explained why the point Skemas were like that.

[Interlocutor 3]

There seemed to be a consensus among drivers that the Skema's updated weekly and their allocation was determined by the number of completed trips in the preceding two weeks. Some drivers speculated that other 'performance indicators' such as customer ratings, order cancellation, or even how much they turned the apps on or off, might also affect the algorithm. For some drivers, these issues were expressed as making 'mistakes'. Mistakes that they could avoid if only they knew the rules of the game. It implies that there is a specifically correct way to be a driver-partner, but that the company is withholding the necessary knowledge. Instead, some drivers suggested that the company was deliberately not being forthright to prevent drivers from coordinating to 'game' the system.

A few weeks after the new Skema were introduced, the display on the customer side of the app also changed. Suddenly it was possible to see exactly how many trips a driver had completed in the past week depicted in Screenshot 16. It is unclear exactly why this information might be relevant for customers, but its position next to the customer star rating communicates to the customer that this is a form of metric and signals that a good driver is a productive driver. Mentioning the change to a driver, he expressed surprise and asked how many trips he had completed. I told him 65. "Quite good" he chuckled. An average of just over 9 trips per day and nowhere near the maximum bonus. As a passenger, it felt like an unpleasant intrusion into the

driver's personal life and circumstances. After all, drivers were supposed to be free agents, self-employed and set their own schedule. Suddenly, I felt like I was not just rating their performance for a single trip, but put in a position of monitoring their activities, unintentionally judging them based on their 'productivity'.



Screenshot 16: Left driver has completed 123 trips, right driver has completed 25. 3 April 2019

The Skema change brought to light an important discrepancy between the company and the driver-partners. As described earlier, the daily bonus constitutes a major part of a driver's income, the reason it is financially viable. Though the company calls it a 'bonus' or 'incentive', for drivers reaching the daily bonus is a major orientation point for their economic and working lives. Though two additional points may seem numerically insignificant, it can mean many more hours on the road, increased expenses, less time for family, friends, and yourself, meaning it can be a serious detriment to the quality of life. Furthermore, it can be dangerous, as exhausted drivers chase points from early morning until the system resets at midnight. As one driver who had been a part of the demonstration described the difference of perspectives regarding point accumulation:

The problem is, I have heard from the upper hands of Gojek, they said this. That bonus is not a target, but an appreciation from the application for drivers. Easy

for them to say so.

[Interlocutor 3]

For drivers, 'token of appreciation' is a mischaracterisation of the importance of the daily incentive for a driver's income and demonstrates a lack of understanding and empathy on behalf of the company. The bonus is not just an incentive, it is a necessary component of the daily income from driving, and so drivers are forced to continue working even as the requirements increase. In practice, the introduction of these measures to 'balance' the ecosystem simply forced drivers to extend themselves ever further. When I asked him how drivers had responded to these changes in the system, his answer was simple. They were *kecewa*: disappointed. It had already been difficult to earn the necessary points and now they would have to spend even more time on the road each day. The poor communication and lack of inclusion of drivers in the continual development of the app was a stark contrast to their alleged status as a partner.

Besides making it more difficult to earn a living this new system also codifies a system of unequal pay. As mentioned, a driver with Skema A receives a smaller bonus than a driver with Skema D: you are limited by the maximum number of points in the Skema you have been allocated. As a driver from the focus group explained to me:

For example, out of us three, he only has Skema 12. So, if he gets more than 12 customers, he only get the bonus at 12. Suppose I get Skema 15, within a day I get 20 customers, the bonus is not the same as for Skema 20.

[FGD 3]

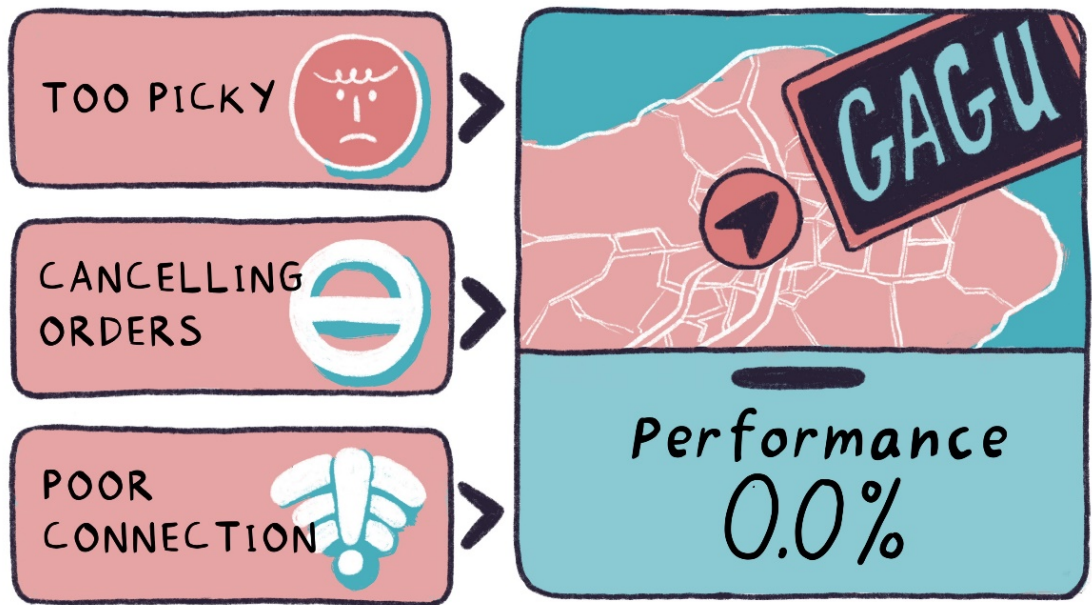
The result is that drivers experience that the value of their labour fluctuates depending on what Skema they have. Even if both drivers complete 20 trips, they will not be compensated equally for their work. When describing the various Skema to me, some drivers would differentiate the Skema as being for 'lazy' or 'diligent' drivers: *malas* or *rajin*. In doing so, they reproduced the moral judgements emphasised by Ananya Roy (2010), that legitimise the exploitation of the poor in service of the middle class (Ray and Qayum, 2009). Now, these judgements were rigidly codified. 'Lazy' drivers were punished by having their opportunity for income reduced for at least a week at a time. Even if they worked long hours they would never be able to earn as much as a 'diligent' driver who had completed more trips in the preceding weeks. In effect, this also means that the outcome of not working exacerbates the situation so that time spent outside the platform not only reduces income for the day but possibly for several weeks in the future. To the platform, being 'diligent' means that you cannot have a sick day, a vacation, or spread your labour across more than one app.

As the algorithm allocates Skema based on completed trips, drivers depend on the algorithm to

assign trips to them. Theoretically, this is out of their control – they can only accept and complete what they are assigned. The significance of this is best illustrated through the story of a driver who towards the end of 2018 was forced to return to his home village in central Java following the death of his brother, which I introduced in chapter 2. His younger brother had passed away and he had returned to help with the funeral arrangements and be with his family. Once back in Jogja, he activated the driver app, only to find he was no longer receiving orders. After hours of driving around and waiting, he finally called ‘Customer Service’, who promptly told him that the system was working just fine and that there was nothing wrong with his account. *Silakan*, please carry on.

20 days later, with expenses for food, fuel, and car rental piling up and still few orders, the driver decided to cut his losses and sell his corporate account for Rp 1,200,000. This was not much he told me, as a ‘good’ account could sell for Rp 3,500,000. The account had belonged to his brother, and since he was dead, he was unable to go to the company office to change any of his personal details: the new owner would have to accept the risk of an incorrect photograph, name, and license plate. Ultimately, this driver was happy with his decision and invested the money in a food cart, eventually earning enough for his wife and child to join him in Jogja.

Months after the exchange, the buyer reached out to let him know that he had finally managed to fully resuscitate the account, meaning, it was finally receiving orders again. The buyer had given the account *terapi*, therapy to gradually nurse it back to health. Account therapy is a term used by some drivers to describe a variety of practices deployed to train the algorithms that govern order distribution on the platform. When an account is unable to receive orders, it is sick, or *gagu* meaning muted, silent, dead. By contrast, a ‘good’ account is *gacor* short for *gampang cari orderan*, or, ‘easy to find orders’. Again, theories about what causes accounts to become sick abound; perhaps you are being too picky about what orders to accept, cancelling orders frequently, spending too much time in competitive locations, or simply using a poor-quality SIM card for your phone.



to fix a 'sick' account, there are remedies.

1

10GB Rp 150k
6GB Rp 90.000
20GB 00.-

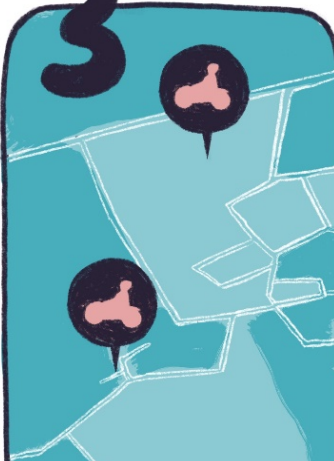
Getting a better data package.

2



Never cancelling orders.

3



Spending time in nearby small villages.

Illustration 6: Account therapy remedies for a 'gagu' account

Fortunately, there are also remedies. One driver, described to me by others as an account expert, spoke with great pride about how he maintained his account in perfect condition, always receiving the best point Skema, and receiving orders within minutes of turning on his app. Therapy measures he recommended ranged from getting a better (more expensive) data package, never cancelling orders, and spending time in nearby small villages so that your account might 'get used to' accepting orders again with less competition. Other drivers shared their strategies: one cleared his cache by continuously deleting his driving history on Google Maps, another turned on his account at 1 in the morning so that it would have diligently been active for many hours by the time he started working. An older driver commented on how it was better to be continuously driving, rather than stopping to chat or hang out with other drivers so that the GPS does not catch you resting. Advice on how to maintain a *gacor* account, or to manipulate the app algorithms proliferate throughout the driver communities, WhatsApp chats, Facebook groups, and YouTube channels. As described earlier, the account itself is the single most important component for a driver-partner, and account therapy is not just a form of intervention, it is a continuing practice since maintaining the vitality of your account becomes a necessary part of the job when the conditions of your work are governed by algorithms.

These examples are just some of the mechanisms that drivers deploy to manage life on the platform. Caring for your account by giving it therapy is about trying to give yourself the best possible conditions for earning a viable income. It is also an example of creatively using the mechanisms within the system against itself. There are many more tricks that drivers deploy to 'outsmart' the system, efforts to resist the rigid digital parameters imposed and continuous adaptations by the app and its creators. As another informant reasoned when I asked him about his strategies to 'trick' the system, "the system is made by humans. Rules are made by humans, and rules are made to be broken" [Interlocutor 9]. While caring for your account can be a method of resistance, as the drivers themselves point out, there is a tremendous discrepancy in power and resources available between those who make the apps and those who depend upon it for income.

I would argue that the main job of a driver-partner is to be available to the consumer-cyborgs: able to receive orders, to be 'on demand', to be *onbid* as the drivers put it. With the changes to the incentive Skema, two drivers can both be *onbid* from 10 in the morning to 5 in the evening, and it is the app and the resources they put into maintaining their accounts that determines how many orders they will receive. Thus, the app implements new digital inequalities in which some drivers are structurally prevented from earning as much as their peers, thus introducing new hierarchies of servitude. Through these infrastructural arrangements intended to optimise service for the consumer-cyborgs, drivers are configured as moral subjects, judged based on the productivity of

their service. The outcome of that algorithmic judgement determines how their labour will be rewarded. It is far removed from the ideals of transactional equality imagined in a P2P exchange.

5.5 Conclusion

As a driver, working for a ride-hailing app in Jogja is not as simple as creating an account and accepting customer orders to earn a living. The work involves many subtle forms of labour to placate both customers and the algorithms that influence your ability to receive orders in the first place. Orders are distributed to drivers based on both their proximity to the customer but also the algorithmic prioritisation of some accounts over others. In practice, the app rewards those drivers who have already been 'productive' by prioritising them for order distribution. The configuration of a productive driver-partner through the lens of the app is one that completes many orders: you must be available to accept orders and avoid cancelling them. Conversely, for drivers who take time away from the app, or who cancel orders that inconvenience or disadvantage them, the app punishes them by lowering their prioritisation for new orders, which in turn leads to a lowered trip completion rate, and thus a lowered 'productivity'. From the point of view of the companies, one could argue that this serves to create a more reliable service for customers, who do not want the experience of not being able to find a driver or having drivers cancel trips. However, in exchange for reducing this inconvenience, I would argue that the app exercises algorithmic cruelty (Gray and Suri, 2019), as the effects compound to great consequence for the drivers. In the case of GoCar drivers, not only will they be exposed to reduced income through completed trips, but they will also find themselves structurally limited to lower value incentive Skema which can affect their income for a week at a time. When drivers attempt to address their concerns about challenges with the order distribution algorithm, the response they meet from the company representatives frequently refer to how 'the system' is working fine. 'The system', which is the app, and its underlying governance mechanisms become almost an abstract entity that leaves no room for arbitration or negotiation of these structural injustices.

Drivers are treated as though they were just another user group of a platform, referred to as 'driver-partner' rather than employee. Though both the app companies and the drivers depend on one another, it is drivers that are disadvantaged because they depend on the company as individuals, whereas the company simply needs to maintain a fleet. For this purpose, the companies benefit from the broader socio-economic context where many people are poor and are willing to accept the working conditions of the app because there are limited alternative opportunities. In Jogja, this is true to the extent that it is no longer possible to register as a driver. This means that the driver accounts that already exist are in finite supply and hold high value as

they represent the access point to the app, its customers, and thus a source of income. Should a driver choose to leave the business, the account can live on, sold to a new owner. This means that drivers must take great care of their accounts, being careful to avoid suspension or having their accounts permanently closed if they behave in violation of the terms and conditions of the platform. Furthermore, they must engage in continual maintenance of the account to ensure that it is at the top of the prioritisation list when the app allocates customer orders: a driver account is only useful to its owner to the extent that it gives access to income. Drivers engage in care practices for their accounts, sometimes referred to as 'account therapy' which are intended to maintain the 'healthiness' of the account in terms of 'receiving' orders. Lacking care can lead to the quality of your account deteriorating and becoming silent.

For customers, all of this work and its subsequent anxieties are invisible in the encounter with the driver-partner. For customers, engaging with a driver is a convenient momentary experience of employing a private driver. This experience is perhaps closer to the idea commonly expressed by such ride-hailing platforms, in which the platform simply provides the neutral space for services providers and service users to find one another. Thus, it can be difficult to see the extent of the intermediation that goes into curating and mobilising the fleet of driver-partners to be at the service of the consumer-cyborg. Therefore, it can also be difficult to understand the extent of the power that the app gives its customers when these are enrolled in the monitoring and evaluation of the drivers. Split-second decisions about star ratings or whether to report that a driver has requested a trip cancellation can have monumental algorithmic consequences for the quality of a driver account and thus for the income of its owner. For some users, this becomes a deliberate tool, wielded to pressure drivers, or as punishment if their behaviour is displeasing. Rather than employ the drivers, the app positions them as temporary employee of each customer that they encounter. It is a precarious position, the parameters of which are defined by the digital infrastructure and which places the burden on drivers to engage in relational work to manage and navigate each exchange relationship to secure a positive outcome.

The idea that these platforms are neutral spaces for exchange is part of the pervasive narrative surrounding P2P payments. Not only does this obscure the significance of the intermediation taking place through the platform company, but it also obfuscates that there can be multiple intermediaries involved in the exchange between the customer and the driver. One of the most prominent examples of this is the role of 'account vendors' for GoCar drivers in Jogja. Using the digital infrastructure provided to them by Gojek, account vendors can establish new driver accounts for drivers who for various reasons have not been able to register directly with Gojek. Thus, vendors manage their own smaller fleets of drivers, and critically, preside over the digital

wallets of their affiliated drivers. Control of the digital wallet means that they can extract their commission from a driver's digital earnings as they manually transfer the income from the digital wallet to the driver's bank account each day. For drivers with vendor accounts, this adds additional instability, as they rely on the vendor to ensure timely transfer of income, and on this transfer to be correct.

Presiding over fleets of drivers, vendors also perform an important role in the configuration of the driver-partner. They can communicate to the driver about how to use the app in ways that go beyond its technical specifications, for instance teaching them about methods for engaging with customers. Vendors benefit financially from drivers continuing to have high digital income, and thus they are invested in ensuring that drivers behave in accordance with the role of driver-partner the form that the driver is expected to take on to best serve their customers and the app itself. Through their extensive Facebook and Whatsapp communication networks, they can communicate to drivers to warn them about behaving in ways that might negatively impact their accounts, and thus reinforce messaging from the companies about how 'the system' will inevitably punish them for what is considered bad behaviour in the eyes of the platform. In reality, the constantly shifting conditions of the app are evidence of the ingenuity of drivers, and the influence they exert as they reconfigure their roles by deploying third-party apps, sharing their methods of account therapy, or collaborating with customers to subvert the platform in ways unanticipated by its designers. Their efforts challenge the rigidity of the social and technological boundaries of the app, and thus the companies proceed to continuously reinforce them.

The apps present the labour of drivers as convenient and cheap, generate and reinforce expectations of customers through the visual language of the interfaces. The true cost for drivers in delivering this service becomes invisible, and thus undervalued and underappreciated. It is not just that the companies exploit the labour of drivers, and the socio-economic circumstances that many of them are in, it is customers too who become enrolled in this exploitation. The app creates easy access to a servant class, through which anyone can quickly, cheaply, and conveniently momentarily employ someone to do things for you. This holds true for the integrated payment mechanisms too. This is not to say that drivers do not benefit from digital payments, indeed, for many, it provides certainty of getting paid, and freedom from having to deal with small change. However, for drivers who rely on vendors, digital payments mean additional loss of income and the loss of agency over earnings. Once again, it is those already at a structural disadvantage for whom cashless payments bring additional challenges rather than a hassle-free or empowering and inclusive experience.

CONCLUSION

In this thesis, I investigated how the dynamics of ride-hailing apps affect the circulation of money through their integrated digital payment platforms in Indonesia. As in many other countries, the use of mobile phone-based digital money is gaining popularity, particularly in the form of peer-to-peer (P2P) payments that allow people to use phones rather than bank accounts to make digital transfers. Manifested in Indonesia in the form of 'e-money', this type of digital currency allows companies to issue digital credits in exchange for state-issued cash. Customers can access these credits through an app and then use them to make transactions within the platform ecosystem. By doing so, they can bypass conventional banks and make digital payments directly through the technological infrastructure provided by these financial technology companies. This form of payment technology also introduces new mechanisms of control over each transaction. The companies providing the digital infrastructure not only issue private programmable credit tokens but also control the conditions for exchange within the broader ecosystem of services within the platform. I explore these dynamics through ethnographic research in Yogyakarta, Indonesia, where I examine what began as the ride-hailing platforms Gojek and Grab and their respective integrated digital wallets GoPay and OVO. Specifically, I chronicle how the digital technology deployed by these platforms impact both the circulation of money, people, and services, and how they influence the conditions for exchange between people using these digital payments systems for transaction.

Through my empirical material, I centre the practical lived experience of using these payment systems. In particular, I draw attention to the experiences of those working as 'driver-partners' for the ride-hailing app, for whom the use of the digital payment system is non-optional. Contrary to customers of the app for whom digital payment may be a transitory experience, a negligible part of an exchange, drivers engage with the digital wallets on a daily, if not hourly, basis. Their

work as recipients of digital payment and as exchange agents for customers means that it is the labour of drivers that enables the implementation of a digital payment system within these platforms. Through my research, I interrogate the concept of P2P payments, with its frequent connotation with arguments of financial inclusion, and examine what inclusion can look and feel like as these platform companies encourage the increased use of cashless payments. I argue that rather than improve livelihoods by providing 'access' to the digital economy, these companies produce very specific forms of 'inclusion', reproducing existing socio-economic inequalities. The poor, unbanked, or structurally disadvantaged are enrolled through the app in the position of service providers to consumers and are consequently kept captive by the apps' provision of their livelihood. The digital technology then, not only imitates existing mechanisms for exploitation but exacerbate them through algorithmic management of labour and control over the circulation of value. In this conclusion, I first summarise the chapter arguments followed by reviewing three central discussions of the thesis which contribute to the scholarly debates on the circulation of money, people, and services in digital capitalism.

In *chapter 1*, I investigate the concept of P2P payments. Specifically, by examining how the use of the term has been translated from its origins as a technical term describing non-hierarchical network topologies, to a form of payment that allows two people to make an exchange using digital money without a bank as an intermediary. I show how this form of payment emulates the flat and egalitarian ideals of P2P networks, benefitting from the social meaning evoked by both the term 'peer' and the concept of P2P transaction, while paradoxically implementing exactly the type of centralised intermediation that P2P technologies sought to replace. I show how digitalisation of money and payment infrastructures enables this increasing centralisation and consequent control over the circulation of value, while also allowing these intermediating companies to extract value through an extensive collection of transactional metadata. I argue that the term P2P can obscure both structural inequalities and complex power dynamics between exchanging parties, as well as the full extent to which the intermediating companies define the conditions of their exchange. Thus, I ask how the use of the term 'peer' changes the implied dynamics of exchange and propose that analytical attention be given to the ways in which these companies configure their users for peerhood and either introduce or reinforce existing socio-economic inequalities through their digital technologies.

In *chapter 2*, I provide context for this analysis through the concept of 'digital wallets' in Indonesia. I first examine how infrastructures of connectivity and payment converged in the form of 'e-money': a digital credit issued by private companies which can typically be accessed through a smartphone app. The recent rapid increase in the use of e-money aligns well with broader political

ideas about what constitutes the modern, digitally networked, and cashless Indonesian society. I show how existing inequalities affect who can participate in this modern digital economy and the occasions under which this participation can occur. Specifically, I emphasise how those who most depend on the use of cash become vulnerable in this digital transition and remain dependent on the ability of money to be re-materialised as cash. In the second part of the chapter, I introduce two of the central digital wallets in Indonesia. Both benefitted from their prominent position as integrated payment mechanisms for popular ride-hailing apps, and from converting the fleet of driver-partners into e-money exchange agents. I argue how these companies conceptualise their products as being in service of the ‘consumer-cyborgs’, the imagined customer for whom the app, and its drivers, become an automated extension of the self, enabling the rapid, cheap, and convenient circulation of goods, people, and value. As these companies grow into larger platforms, they expand from transport to broader financial services, attracting extensive international investment. I point out how much of this expansion is accompanied by claims about increasing ‘financial inclusion’ through the proliferation of financial technology to those considered to be excluded from formal financial services.

I begin *chapter 3* by interrogating the assumptions underlying arguments about fintech and financial inclusion. I show how these technological initiatives to alleviate poverty often arise from an individualistic understanding of poverty rather than seeing poverty as the outcome of structural inequalities. This orientation facilitates moralistic judgement: being poor becomes a personal responsibility, justifying the exploitation of those who are already socio-economically marginalised. Moreover, they do not adequately consider how these structural inequalities and cultural differences result in an experience of cashlessness that is not universal and can lead to new forms of exclusion. I argue that these platform companies insert themselves as the interpretive interface for existing social infrastructures, and in doing so, obscure the necessary labour of drivers through the language of automation while configuring drivers in a position of servitude to the apps’ customers. The apps provide a stabilising interface for the access and navigation of the drivers’ labour and the conditions of exchange. Thus, I argue that driver-partners can be conceptualised as an infrastructural extension of the app’s digital environment: physically enabling the circulation of people, services, and money.

In *chapter 4*, I investigate how drivers and customers are configured through the app infrastructure and how this influences the circulation of value. I examine the appearance and function of e-money and illustrate how the apps explicitly position cash as an inferior and expensive form of payment compared to the company-issued digital credit. Digital payments become associated with making certain types of products and services cheaper. I argue that it is

the people who already have high levels of access to resources – those who can afford superior technology and maintain multiple digital credit balances – who are best positioned to take advantage of these new systems. I demonstrate how this digital system relies on the ability of payment recipients to convert their earnings as cash, to the point where having a bank account is a requirement for driver-partners. Thus, I argue that it is the drivers who take on the additional labour of making cashless payments 'hassle-free': by managing liquidity across multiple wallets, rematerialising digital money as cash, and doing the persuasive work of bringing new customers into the 'digital economy' by selling their own balances in exchange for cash. Rather than being cashless, the system is premised on the existence of conventional banking infrastructure and the use of cash, enabled by the ability and skill of drivers to manoeuvre value between digital and tangible forms. I argue that in their pursuit of advancing the use of digital payments, the apps disadvantage drivers by prioritising the ability of customers to easily access and use digital money. By centring the needs of the customer, the driver is configured into a position of servitude, rather than as an equal exchange party, a relationship belied by the theoretical equivalency of peer-to-peer transactions.

In *chapter 5*, I examine how the companies mobilise drivers in this way, by organising their labour through algorithmic management. I demonstrate how this requires drivers to expend additional labour and resources on maintaining the quality of their account, which includes careful navigation of each customer encounter, as customers are enrolled by the companies in the management and reporting of drivers. Miscalculations can lead to long-term negative algorithmic impacts on the driver account itself. The use of differentiated bonus mechanisms is an example of how the impacts compound, resulting in unequal financial compensation for labour. The structural inequality perpetuated by these systems reflects the same moralistic assessments of whether a driver is 'productive' or 'lazy', which contradicts the idea of a free and flexible labour platform. The intermediation of account vendors is another example of how this system creates structural inequalities between driver accounts, with some being more precariously positioned due to lack of control over their digital wallets and earnings. I illustrate how drivers deploy various strategies both within and outside of the app environment to navigate and even subvert algorithmic management. However, they are fundamentally disadvantaged by a digital system that is constantly adapting in response, and which sees each individual driver as being a replaceable piece of the infrastructure. I argue that these platforms benefit from existing socio-economic inequalities that provide them with access to an unlimited labour force. Rather than improve livelihoods by 'including' these people in the digital economy, I argue that these platforms reinforce these structural inequalities: enabling people to quickly, conveniently, and cheaply

employ a temporary servant who can facilitate the circulation of people, goods, and money.

Together, these chapters provide an important contribution to the limited existing scholarly work on digital money in Indonesia. Specifically, by drawing attention to how the implementation of such digital technologies is experienced in practice by those who live with them or depend upon them to make a living. These insights are of particular importance as these companies continue to expand both their customer base and the range of financial services they offer, encouraged by the broader political context that emphasises digitalisation and an image of a modern, digitally networked cashless society. Not only is Gojek already expanding its technological reach to other countries in Southeast Asia, but the prominence of digital wallets such as GoPay and OVO means that their infrastructure design is likely to be a source of inspiration for other companies on how to model similar services. It is not difficult to imagine that other on-demand labour platforms will find similar ways to implement not just labour management infrastructure, but also technology that enables greater control over the circulation of value in relation to exchange taking place through the platform. Indeed, in late 2019, the infamous Silicon Valley ride-hailing app Uber introduced *Uber Money*, a dedicated team working to develop financial services ranging from a digital wallet to a physical debit card that would “deliver additional value for the Uber community, all at Uber speed” (Hazlehurst, 2019). In mid-2020, they also introduced the digital wallet *Uber Cash* in Kenya which would allow users to ‘top-up’ a digital balance using the familiar mobile money M-Pesa (cf. Bright, 2020; Itimu, 2020). As one tech blog wrote when describing the release of the new feature:

“Uber aims to increase the ride traffic in Africa by boosting the volume of funds sent to digital wallets and making payments more convenient. Uber will still accept cash but this digital wallet move helps them make more strides on financial inclusion through mobile money.” (Onamu, 2020)

Though the infrastructural contexts differ greatly between Kenya and Indonesia, it remains relevant to examine who this digitalisation serves, especially when the argument frequently leveraged is one of financial inclusion. Who is the beneficiary of the increased convenience that is offered by the digital payments for booking trips and ordering food, and how do these companies envision the ‘inclusion’ that they intend to offer?

This research provides critical insights into how these types of integrated cashless payment can be experienced for those labouring for on-demand platforms. It examines how the fleets of driver-partners become a critical part of the digital payment infrastructure and illustrates how much this so-called ‘cashless’ transaction depends on the existing infrastructures for cash. In examining the conditions for exchange as organised by the digital infrastructure of these platform companies, it

also unpacks the concept of P2P payments arguing that the exchange of digital money through these ride-hailing apps comprises far more than the financial transaction and contains much more than can be summarised in an elegant acronym.

Configuring Driver-Partners

By reconfiguring conventional *ojek* into 'driver-partners', ride-hailing companies such as Gojek and Grab created an important infrastructure that would enable them to mobilise labour to facilitate the circulation of value. This was circulation that would take place at the behest of their customers who would transition to using the app platform to purchase these services, eventually even using the money that these companies issued themselves. In this thesis, I propose examining the role of the driver-partner through the lens of social infrastructure, drawing attention to the human labour required to maintain the veneer of automation and the seamless circulatory experience for customers to whom the apps are envisioned as an 'operating system of the real world' (Wirjawan, 2020). This shifts the analytical perspective so that the focus is not just on how these platforms extract value from the labour of drivers, but what services it is that they purport to offer and to whom. I describe how they organise labour relations and, thus, conditions for exchange, not just between the drivers and the platforms, but also between the drivers and their customers. I shift away from an emphasis on the idea of digital services, to the lived experience of the people transacting through these infrastructural arrangements.

The form of service work that these drivers do existed long before either Gojek or Grab inserted themselves as intermediaries. What these companies introduced was an easy interface for access, allowing people who were unable to, or uncomfortable with, interpreting and navigating the transactional norms around the particular type of encounter. Through the apps and the algorithmic management, these companies introduced stabilising parameters for the transaction; for example, by predefining kilometre price and allowing customers to summon drivers directly to their desired point of departure. Theoretically, this could also make it easier for drivers to find customers, but, in practice, drivers now depend on the algorithm to distribute orders and the system is organised for customer convenience. Saturation of the driver fleet and ranked order distribution means that drivers may spend hours waiting for a booking. Rather than provide a neutral platform for both customers and drivers to meet and engage as equal parties in an exchange, the apps manage their driver fleets in a way that optimises the booking experience for service users rather than service providers, reinforcing pre-existing social hierarchies.

What the app offers to customers is the convenience of employing someone to do labour for you under conditions that have already been negotiated in your favour, because the companies are

interested in retaining your engagement with the platform. Through the straightforward app interface, customers can temporarily access a servant who can drive you or deliver food to you. The app facilitates the act of paying someone else to do things on your behalf. Normally this is an experience that requires having a certain level of disposable income, but the artificially low prices of these platforms make this experience more accessible to a broader group of users by considerably lowering the cost of employment. This consumer experience relies on the implementation of exploitative working conditions, enabled by the companies categorising drivers as freelancing partners rather than employees. For drivers, an outcome is a form of relational dissonance. The arrangement means that each customer is a temporary employer, empowered by the control mechanisms of the app to exact great damage on the driver account. This is not to say that each customer behaves with cruelty, but the app skews the power dynamic in such a way that each encounter has the potential to lead to a damaging outcome for the driver. Thus, each encounter requires relational work, as drivers navigate both the conditions imposed by the app and the temperament of the customer, to preserve the integrity of their accounts. The dissonance occurs because the conditions for the exchange and the conditions for this labour have all been defined by the company providing the app, with a clear emphasis on the expectations for what they consider to be 'productive' driver behaviour. Thus, drivers not only have to placate their customers, but also the algorithms that control their ability to generate income. There is simultaneously no boss, but also many bosses: an outcome of the lacking responsibility taken by the companies to employ the drivers. The way that these drivers are infrastructurally mobilised in servitude is largely rendered invisible to the customer. For customers, the experience of using the app to make an order begins with inputting a booking and ends with a payment. They cannot see the amount of additional labour required for drivers to maintain their accounts to receive orders at all, or to reach the daily bonuses that are needed to subsidise the low income from trip fares. Thus, the infrastructural labour of drivers is easily devalued, contributing to their continued exploitation.

Examining these systems through an infrastructural lens encourages us to examine the politics reflected in the infrastructural arrangement. Particularly noticeable is how these companies leverage arguments of financial inclusion for the advancement of their platforms. As they speak about providing 'access' to the digital economy, it is important to consider the form that this inclusion takes. Through the apps, drivers, many of whom are unbanked, gain access to potential customers who already use the platform, but they are not included on equal terms with these other platform users; they are not on par with the imagined consumer-cyborgs. By casting them in a prefigured service role, these companies reproduce existing socio-economic hierarchies and

also exacerbate these inequalities through the conditions for both labour and payment deployed by the platform. In doing so, I would argue that the app creators reveal their own positionality, reflecting the service priorities of their lifestyles as the consumer-cyborgs for whom the apps are designed to benefit. This contradicts the narratives of the so-called 'gig economy' which suggest that platform labour enables flexibility and autonomy for the worker that puts them on the same hierarchical step as the service users. Though they emphasise initiatives intended to improve the conditions and livelihoods for drivers, ultimately, what they have created is a technology that makes it easy, cheap, and flexible to be an employer of on-demand labour. Thus, customers are inducted into the perpetuation of the exploitation of driver-partners. By drawing attention to how these apps configure drivers and customers, and the dynamics of their exchange relationship, I encourage an examination of how these apps contribute to social reproduction in which those with resources are enrolled and enabled in the exploitation of those without.

The apps do more than just reproduce existing inequalities between customers and drivers, they also introduce new digital hierarchies of servitude within the driver class. In the thesis, I present two central examples pertaining to GoCar drivers: the implementation of vendor accounts and the use of differentiated incentive bonuses. The precise reasonings for the infrastructural arrangement of account vendors is unclear; perhaps it was the outcome of a legal arrangement or a method for leveraging the local networks of vendors in enlisting new drivers. Though vendors offer some flexibility in registration, they also function as an additional intermediary between driver, customer, and the company. Their position as arbitrator allows them to exercise rentiership endorsed by Gojek, extracting money from the labour of drivers, which is enabled by the fact that they control the digital wallet and the consequent circulation of money. Drivers depend on trusting the vendors to make manual bank transfers accurately and efficiently to receive their income. This infrastructural design makes drivers very vulnerable, emphasising that the digital payment system here is not designed to make their lives easier. All drivers are also dependent on daily bonuses to supplement their income and the introduction of four separate incentive systems means that the value of a driver's labour and thus the income opportunity is differentiated. Whether by intent or by neglect, this is a cruel system, especially because drivers do not singularly control the distribution of orders or the circumstances that enable them to be completed. Not only are drivers not being paid per 'gig' that they accept, but their composite income changes depending on how many gigs they complete over the course of several weeks. Thus, the effect of taking time away from driving compounds over time. This structural discrimination values labour based on previous behaviour and 'productivity' levels, mechanisms that are designed to maintain the steady circulation of drivers, and thus, people, goods, and

money. This directly contradicts the companies' narrative that this type of on-demand labour gives drivers flexible working conditions, or that these platforms are neutral intermediaries for service providers and service users. The skewing of the positive benefits towards the customer is driven by the fact that the platform itself earns money through the continued engagement of this population, both from the cut of profits exacted from each transaction, as well as the promise of transactional metadata. This is an infrastructure designed to improve the reliability of service to engage and retain customers, at the expense of the service-providing drivers.

Cashless Aspirations

Platform companies and platform users have distinct and complementary incentives for desiring the broadening of the reach of digital payment apps. On the one hand, companies are highly motivated to widen their customer reach and range of services since they earn money off of every transaction conducted via the integrated digital payment mechanisms of their apps. On the other hand, people use digital payment systems when it is easier, more convenient, and particularly, *cheaper* to use as a form of value transfer than cash. While companies extoll the advantages of cashless payments, it is important to remember that expansion takes place in a context where the majority of the population still depends on cash for their daily economic needs. To take advantage of the payment system, individuals need to use cash to purchase digital credits to top-up their digital accounts and the system is designed in such a way that customers can top-up via drivers. As a result, drivers are infrastructurally positioned as both distributor and recipient of digital money, but for them to make use of their digital income, they must convert this money into cash again. Thus, these digital payment systems are premised on the parallel circulation of cash and the ability of drivers to manoeuvre value between digital and tangible forms.

By introducing integrated digital payments these companies reconfigured the role of driver-partner from transport service to facilitator of the digital economy. It became possible for drivers to receive payment in the form of digital credit, which meant that the infrastructure had to include a way for drivers to extract their earnings into cash. Consequently, the possession of a bank account became a requirement for being a driver-partner. Collaborating with a commercial bank, Gojek provided drivers with a simple account that would allow them to 'cash-out' from the app into a bank account, and then extract this digital money as cash through an ATM. For drivers, the digital payment system also meant the introduction of a wallet system that is distinct from that of customers. For customers, it is possible to use these apps without having a bank account with digital wallets that allow them to top-up their accounts to make payments for affiliated services in the app, and, in case the account is upgraded, to transfer money to others.

Drivers have to manage multiple wallets. One allows them to receive payment and to transfer this money to a bank account by cashing-out or transfer it to customers by selling their balance. A second wallet is used by the company to extract their cut of the driver's income, meaning that drivers must maintain enough balance in this wallet to enable these automatic withdrawals. A third wallet allows drivers to transfer income directly to their version of the customer wallet so that they can use this digital credit to make purchases themselves rather than cashing-out. How drivers experience this arrangement depends greatly on their existing socio-economic circumstances, with some earmarking their digital earnings as money that they will use to take advantage of the discounts these apps provide as customers. For others, cashing-out and withdrawing the balance was a critical part of the daily experience, and sometimes a challenging one, if they were unable to find an ATM, or if they experienced technical delays. Thus, it is largely customers for whom digital payment may be perceived as 'hassle-free'. Through their labour, drivers comprise an extension of the digital payment infrastructure: enabling customers both the conversion of cash into digital credit and the use of that credit as a method of payment.

When paying for services within these platforms as a customer, it is intensely obvious to an observing eye that the choice of payment methods is not simply a question of preference or convenience. The companies use the visual language of the apps to encourage customers to select the digital option, even going so far as to subsidise individual transactions, rather than earning money from them. The purpose is to attract customers, to generate volume of transaction, and to familiarise people with digital payments; it can be viewed as an investment in a value-generating population, in monopolizing a market. These companies aim to make their platform and its digital credit the reflexive payment method of choice for the users and to keep the money circulating within the system. In practice, customers perceive that the purchasing power of their money is higher when stored in digital form compared to cash, specifically when it comes to purchasing goods or services they might otherwise have considered too expensive. The payment options are not presented as neutral equals as the apps actively discourage the use of cash, almost as though they were discouraging the use of a competing currency. In this way, customers can be made to feel that using cash is an additional expense. To take advantage of the discounts offered through e-money, customers must maintain a liquid digital balance by storing some of their money in the form of credit – those who can afford to might even maintain balances across multiple apps. In practice, this means frequently using cash to purchase digital credit, a transaction often mediated by drivers. The enticement of company discounts to engage customers on a particular digital money platform can reach the extent of using the digital payment to reduce the cost of a driver booking, only to then pay the drivers in cash to top-up your account. For the company, digital

payments to drivers ensure that they have the liquidity to sell balance back to future customers, and thus, keep digital money circulating within the system, to the benefit of the platform companies.

The experience of engaging with cashless payments is not universal. Firstly, many customers use these platform services without using digital payments. Perhaps they simply do not feel comfortable with digital money, or perhaps they do not own a smartphone, relying instead on others to make bookings on their behalf. While these customers can still access the platform services, cashless payments are experienced primarily as increasing the perceived cost when using cash to pay for services. It is those who can afford to earmark their money for digital consumption that can take advantage of the perks offered by the digital system. Moreover, the experience of cashlessness also depends on which side of the transaction you are on. Unlike the experience of consumers, for whom cashless payments are often just the means to a discounted service, for drivers, cashless payments are a non-optional part of their work. Consequently, drivers are highly dependent on how the circulatory infrastructure is designed because, for most of them, cashless payments mean eventually having to rematerialise that money in the form of cash.

There are two main mechanisms through which drivers can convert digital credit into cash. The first is by selling their balance to customers, which is an instant conversion to cash. The second is by 'cashing-out' of the app by requesting that the money be transferred to the affiliated bank account, after which the money can be withdrawn as cash at an ATM.

Though drivers are not the only way for customers to top-up their accounts, they are the only option that does not include a transaction fee. As I have shown in the thesis, how a company chooses to incentivise drivers to act as exchange agents greatly influence how these individuals navigate the role, as well as the according circulation of money. In the case of Gojek, drivers receive points that count towards their daily bonus targets, although they are required to sell a minimum amount each time. For GoCar drivers, each top-up of Rp 100,000 only awards half a point. The result is that some drivers are protective over their balances, opting to withhold top-ups for customers whose top-up requests will not help the driver reach the daily goal. In the case of Grab, drivers are rewarded with a 'cashback' of a percentage of what they transferred, meaning that there is a direct correlation between selling balance and daily income. The result is that drivers might offer customers top-ups, doing the persuasive work of convincing customers to try digital payments. Drivers would describe 'preparing' their balances as a part of the daily work: making sure that they had enough money in their digital wallet for company extraction and customer top-ups. In both cases, drivers would occasionally use customer top-ups as an

alternative opportunity for 'cashing-out' their credit balance, withdrawing cash from the customer rather than an ATM.

The ability of drivers to 'cash-out' is critical to the existence of a digital payment system in a society whose transactions are still dominated by cash. In practice, this means that this novel digital payment technology still relies on the platform companies having a well-functioning integration with conventional banks. Such a system introduces multiple steps that can complicate the flow of money for drivers, as Gojek experienced in their early implementation that relied on manual transfers, meaning that drivers could not withdraw on bank holidays. The interests and convenience of the drivers are further overlooked when, rather than receive an instant cash payment, they are forced to rely on the digital system and depend on the company to ensure that they can continue to access their money. Platform companies may make the effort to improve these systems for drivers by seeking to reduce the vulnerabilities of the system and improve efficiencies, but ultimately, these digital payment systems were designed to protect the financial interests of the company by facilitating transaction for customers. While the system may continuously be developed, the needs of drivers continue to remain secondary, as the system was not designed for their convenience.

An example of how drivers are at the mercy of the infrastructural design is the way that Gojek has implemented its account vendors system which allows GoCar drivers to register for an account through a vendor rather than directly with Gojek. For these drivers, the digital wallet, and the process of 'cashing-out' are controlled by a third-party vendor. Control of the digital wallet allows vendors to extract their share of the driver earnings at the moment they make the transfer. While Gojek has emphasised improvements made to automate this process for drivers registered directly through the company, vendor transfers are still made manually. Constraints in terms of time and resources allocated make the transfer process error-prone and subject to the familiar problem of being stymied on bank holidays. This may not be a problem for drivers who have financial stability, but for drivers living hand to mouth off of daily earnings, this can have significant ramifications, including not having money for food or being unable to afford the running costs of operating as a driver. Once again, the experience of the cashless system is not universal, and drivers come from vastly different socio-economic backgrounds. As with customers of the app, it is those who are already most precariously positioned who are most disadvantaged by the digital payments system – for many of these drivers, it would be better to be simply paid in cash.

The question of ownership of the digital wallet and its contents is not just relevant in the case of account vendors. Drivers frequently expressed fears of being cut off from access to their digital

wallets if they were suspended from the apps. As on-demand labourers, they are vulnerable to sudden disruption of access to the app, which can occur in a myriad of ways. A common path to loss of access is via the app's algorithmic management, which can automatically suspend drivers in response to a negative customer rating; obviously, this places the customer in a position of power over the driver's livelihood. In cases of drivers violating the terms and conditions by using purchased accounts or those that belonged to relatives, it would not be possible to negotiate a suspension by complaining at the local company branch office because turning up in person would reveal the deception. In such an instance, they would lose not just their account and future access to income, but also any money they were storing there, leading many drivers to only store as much as necessary when 'preparing' their balance for the day. Though the digital wallets technically 'belong' to the drivers themselves, in practice, the infrastructural design raises questions about the true owners of these digital wallets and their contents. In the example shared in chapter 4, the top-up mechanism in Grab prioritises the need of the customer to access digital money, essentially making the entirety of the driver's wallet accessible for withdrawal without regard for the driver's wishes. Even if customers respectfully ask, then negotiate an amount and take care to pay the equivalent in cash, the fact that drivers were technically unable to consent to this transaction illustrates how the designers neglected to consider the drivers' agency over their own wallets and earnings. Such design may not have any malicious intent, but much like with instances of algorithmic cruelty reflects neglect, revealing that the contents of a digital wallet do not truly belong to the driver until they have been withdrawn as cash. Instead, the wallet is there to enable customers to access and make use of the company issued digital credit.

If cashless payments are meant to be 'hassle-free' for customers, then it is in large part because the hassle of manoeuvring between money forms is passed on to drivers: they are allocated the bulk of the cost of transaction. Cashlessness is simply not a concept that exists in a pure form in practice. Implementing a digital payment system in a context where people depend on accessing cash requires great conscientiousness, especially in the cases of those who are more precariously situated socially and those who are forced to use the system to make a living. A more just system would take the needs of drivers to transition and manoeuvre between tangible and digital money forms just as seriously as the needs of customers. As it is, the system is fundamentally unjust, burdening drivers who cannot opt-out, with the transactional costs of maintaining the digital payment system.

Peers and Intermediaries

Evoking ideas of a lateral and symmetrical exchange, the term 'P2P payments' specifically draws

attention to the equality of the exchanging parties and the flow of their transaction, rather than linger on the intermediary that enables the exchange. The idea of P2P brings to mind a simple exchange: two people transferring money directly to one another through a digital technological infrastructure without going through a conventional bank. The inclusivity and accessibility suggested by P2P payments have resonated with those advancing technological solutions to alleviate poverty, and companies leverage these arguments as they expand their services into the sphere of digital payments. Pertinent to this thesis, both Gojek and Grab have morphed their businesses from providing transport services to digital payments and are pushing into a wider territory of other financial services, including 'P2P lending'. They lean into the narratives of peerhood, specifically in the context of promoting fintech as an alternative to conventional banking, even though use of their digital wallets, GoPay and OVO, as a method of payment is not explicitly marketed as a P2P product. I argue that they take advantage of the positive connotations of peerhood both through their advertising and their emphasis on financial inclusion, especially how they chose to present themselves as a neutral platform on which people can engage on equal terms to exchange money and services. Unlike the use of cash, in which the rules of each transaction have been established by a society's government, banking system, and social praxis, digital payments occur in ecosystems created by private companies and are governed by a private set of terms and conditions. As for-profit companies, Gojek and Grab certainly do not take on any hierarchical responsibility in terms of employment and labour protections, instead treating both drivers and customers as users of the platform: both groups accepting terms and conditions of use. Unsurprisingly, but critically, the terms and conditions for participation in the digital economy presented by these platforms are not the same for these groups of users.

During a trip with a GoCar driver in the last month of my fieldwork, I asked the driver now-familiar questions about his experiences with the digital payment system and whether he felt it made any difference in his exchanges with customers. "Our humanity changes," he responded, referring to what he called the 'virtualisation' of money, before adding "*hubungan kita diganti dengan sistem*": our relationships are replaced with systems. His statement echoed what so many others had already expressed. This was that their relationship to customers felt increasingly transactional, that they were perceived and treated as 'robotic' servants rather than equals. Rather than being treated as equal 'partners' by the company – as would be expected from the pervasive company narrative of 'driver-partners' – they were relegated to communication with 'customer service', where their complaints about challenges encountered while working as driver-partners were met by company employees telling them that 'the system' was operating as intended. As the financial ecosystems of these companies broaden, it is important to challenge this P2P constellation and to

examine their configurations of peerhood: how these companies form and implement the conditions for exchange within their technological infrastructure.

These technologies do not address the systemic inequalities that lead to poverty. These are structural problems that do not have a simple technological solution. Paradoxically, rather than lower barriers of entry and smoothen out financial inequality, the digital technology created by these companies compound existing disparities between service providers and users. The organisation of the exchanging parties privileges the needs of the paying consumers by granting flexibility and ease of access to employing a temporary servant in the form of a driver. The organisation of both labour relations and circulatory infrastructure in this ecosystem, an example of which is the work drivers must do to cycle value through cash and digital credits, is what makes access to the labour of drivers both cheap and convenient for the apps' customers. The apps' implementation of this hierarchical relationship diminishes the drivers' autonomy in each transaction, essentially rendering them hostage to the assessment of both the customers and the algorithmic management of the platform itself. For instance, a negative customer rating, a reported order cancellation, or other behaviours considered negative by the company can all result in reduced quality of the driver account, affecting their ability to receive orders and generate income. In the worst-case scenario, drivers can lose access to their accounts and the potential to attain future income, not to mention any savings they had stored as digital credit. This technological system benefits from existing socio-economy inequalities and reinforces the structural exploitation of those who are already disadvantaged. This is concealed from everyday users through the technological interface and the smooth veneer of automation: how they and the app company benefit from the exploitation of the labour of drivers. As these companies expand their services, arguing that their technology will benefit the poor by providing access to the digital economy through cashless payments, it is important to consider how they control and configure the conditions of this inclusion. These companies benefit from existing social inequalities because the lack of viable alternatives primes many people to accept the labour conditions offered by the platform. By positioning these people in a position of servitude to the customers of the app, the companies contribute to the further reinforcement of these structural inequalities.

The term P2P provides a simplistic rendering of the complex transactional relationships surrounding the technology. Not only does it obscure inequalities between transacting parties, or the intermediating role of the platform, but it also misrepresents the dynamics of the transaction as something occurring between just two people through a single technological infrastructure. Firstly, the people on the two sides of the equation cannot be considered a homogenous group, and as I have argued in this thesis, it is those who already have access to resources that are best

positioned to take advantage of what these systems have to offer. Accessing these platforms becomes more cumbersome the fewer resources you have, and this results in multiple forms of intermediation as well as differentiated experiences of using the technology. Though much of the ideology around P2P technology revolves around removing the ‘middleman’, the reality is that intermediation exists in a multitude of forms not reflected in the P2P acronym.

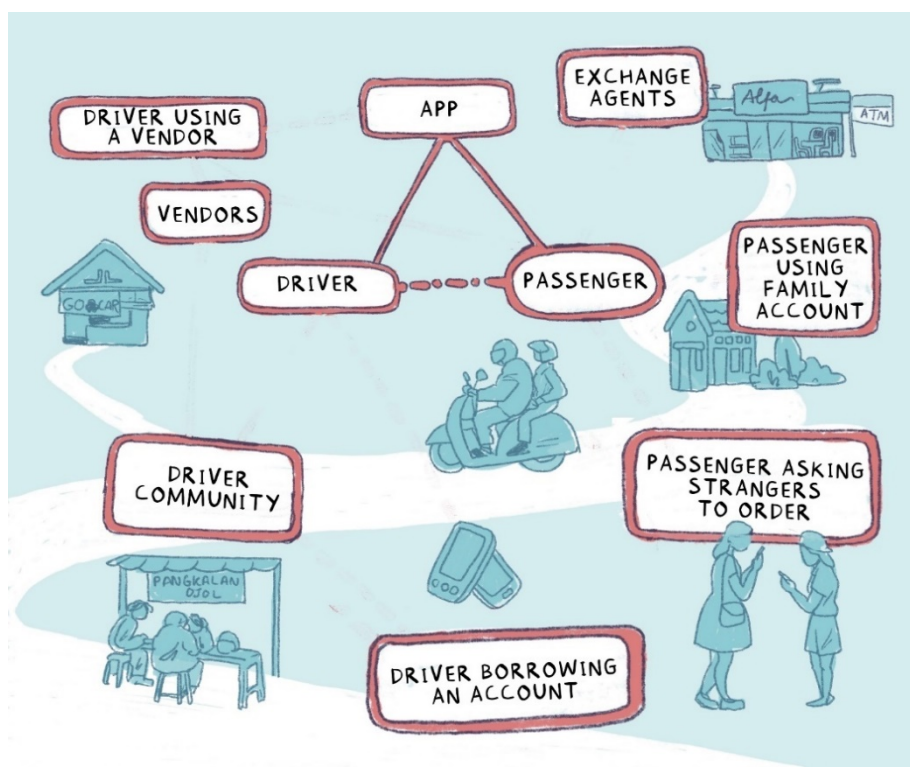


Illustration 7: Multiple peers and intermediaries

One of the most prominent examples of such arbitration is in the GoCar drivers who are forced to access the platform through account vendors. Not only do these vendors control the driver’s digital wallet, but their role as a middleman in a driver’s relationship with the platform company also extends to guiding driver behaviour. They contribute to the configuration of the driver-partner role beyond the parameters specified in the technological infrastructure, for example by stressing the algorithmic precarity of the driver account and advising drivers on how best to engage with customers. However, as an acknowledged intermediary, they can also provide a more accessible and responsive point of contact for drivers experiencing issues than the company itself, even if the vendors’ ability to resolve those issues can be limited. Apart from vendors, indirect intermediaries exist when drivers rely on accounts belonging to others for access to the platform when they are unable to create their own accounts. By doing so, they are, theoretically, violating the terms and conditions of app usage, and their experience of being a driver-partner is one of

much higher risk. This risk is infused in every aspect of their interaction with the platform, from the experience of labour conditions to customer relations to the use of the digital payment system. On the other hand, customers may also rely on others to facilitate access to the platform, as not all users have their own accounts either. In these cases, they have to ask friends, family, or even strangers using the app to make bookings for them and paying the drivers in cash, which possibly means missing out on the discounts afforded by digital payment or allowing others to accrue money through 'cashbacks' in their place. Entire communities have formed around the work of driver-partners, where drivers can share experiences and provide each other with aid and communicate about tools like the 'fake GPS' app, *titik tuyul*. Access to financial services and digital technologies is neither a binary or static category and all of these forms of engagement are contained within the P2P constellation. From children ordering food deliveries for their parents to the app interfaces that actively discourage the use of cash, to vendors adjusting driver expectations, the introduction of this digital infrastructure creates new spaces for intermediation. Resources and the opportunity to engage directly with the system is inversely correlated with an individual's dependence on willing intermediaries to facilitate access. While some of these might include elements of exploitation or manipulation – introducing further refractions of entities extracting value from each transaction – one might argue that many are also examples of people enacting their own forms of peerhood: building rickety bridges to the metaphorical castle of services.

The idea of P2P payments leverages the social meaning and positive connotations of social equality associated with the word 'peer', obscuring underlying power asymmetries between the exchanging parties. Narratives around P2P emphasise that it is a direct transaction that can take place without intermediaries, thus obscuring the power that these companies exert as they define the conditions for exchange within the digital infrastructure. When technology companies are the ones creating barriers for entry and holding the power to dictate the behaviour of driver-partners through their terms of use, it is difficult to argue that they are neutral entities, and these practices will continue excluding slices of the populace from access to digital income. Furthermore, the socially acceptable concept of 'peer-to-peer' ultimately conceals the fact that this constellation is a transactional arrangement that is valuable to the corporation. Users of the apps, no matter if they are drivers or customers, are tools for the platforms because their transactions lead to the circulation of both money and data, which is where profits are derived. Thus, for the companies, the emphasis is not on creating equal conditions for exchange, but on securing continued customer engagement. This is done by providing cheap and convenient services through the platform, which depends upon the exploitation of labour and the displacement of the transaction

costs of digital payment onto drivers. This exploitation and extraction of value from transactional metadata are what is camouflaged in the language of P2P and financial inclusion.

Although P2P may not be the vernacular of customers and drivers, its positive connotations internationally and its association with ideas about providing technological solutions to alleviate poverty mean that these technologies benefit from public acceptability. Companies such as Gojek and Grab continue to receive a lot of attention for how they are 'revolutionising' the economy through digital technology, how they are automating existing systems and 'empowering' drivers by 'formalising' their service. Meanwhile, they are growing into 'super apps', hoping to be the entrance point for accessing and paying for services in Indonesia and neighbouring countries in Southeast Asia, using digital systems to mobilise real human labour, to circulate people's work, goods, and money. They have attracted massive amounts of venture capital from those wanting to be a part of, or beneficiary of, this digital transition, as the companies grow their customer bases, and extend their monopolisation of transactional metadata. After all, Gojek is now one of the world's elusive technological decacorns, valued at over 10 billion USD. Meanwhile, in Jogja, drivers are chasing points late into the night, stressing about preparing their digital balances, and worrying that customers might report them for driving a borrowed account. The dynamics of the digital payment system that these apps have built are intimately entangled with the lives of these drivers, and yet, it is a type of money and service that is oriented towards a specific consumer group. By examining the intersections of the Indonesian ride-hailing apps and their integrated payment systems, it is possible to see that the digital infrastructure these platforms have created is one premised on existing structural inequalities. Gojek and Grab may argue that their digital technologies will alleviate these problems and provide the poor and disadvantaged with alternatives to conventional financial services. In practice, however, the structure of this money system reinforces socio-economic hierarchies and attempts to enclose people within the moat of digital payments as the companies chase profits and market monopolization.

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APPENDICES

Appendix 1: Interlocutor matrix

The interlocutor matrix below provides an overview of the various types of interviews conducted over the course of the fieldwork.

Focus Group Discussions with different user groups			
3 women, RT Blimbingsari, Central Jogja		4 students (men and women), UGM	
3 men, RT Blimbingsari, Central Jogja		4 students (men and women), UGM	
5 women from prayer group, Northern Jogja		3 online Drivers (men)	
5 women from lending group, Western Jogja			
<i>Participants for the focus groups ranged from ages 18 to 58, with an average age of 36.</i>			
Interlocutors	Relationships	Type of Data	Main locations
105 Gojek or Grab car drivers	Casual, recurring and sustained contact	Observations, informal conversation, 6 in-depth interviews	App, in cars, following up at public cafés
15 Gojek or Grab motorcycle drivers	Casual contact	Observations, informal conversation, 3 in-depth interviews with 5 interlocutors	App, at gate receiving food, following up at public cafés
3 Leaders of driver communities	Casual contact	In-depth interviews	Community 'base camps'
30 App customers	Casual, recurring and sustained contact	Observations, conversations, 8 in-depth interviews	Warungs/cafés, university, private homes, Islamic School, language school
14 Warungs/cafés	Casual contact	Brief interviews	Warungs and cafés
1 Internet data seller	Recurring contact	1 in-depth interview	Street counter
1 GoCar account vendor	Casual contact	1 in-depth interview	Vendor office
2 Digital money agents: (unrelated to Gojek or Grab)	Casual contact	2 in-depth interviews	At the community contact point
8 Representatives from Indonesian fintech companies: Gojek, Amartha, Blossom Finance, Blockchain Zoo, Indonesian Blockchain Association, OVO, LinkAja, Dana Cita	Intermittent contact	9 In-depth interviews	Company headquarters, public cafés
2 government agencies: Secretariat for National Strategy for Financial Inclusion, Department for Social Welfare and Poverty Reduction	Recurring contact	Informal conversation, 2 in-depth interviews	Government offices

Appendix 2: Indonesian E-Money Operators

List of companies that have received e-money operator licenses until the end of 2020 (Source: BI, 2021a).

No.	Company	Licence and Registration date	Product Name
1	PT Bank Central Asia Tbk	No. 11/424/DASP - 3 July 2009	Sakuku
2	PT Bank DKI	No. 11/429/DASP - 3 July 2009	Jakarta One (JakOne)
3	PT Bank Mandiri (Persero) Tbk	No. 11/434/DASP - 3 July 2009	Mandiri e-Cash
4	PT Bank Mega Tbk	No. 11/443/DASP - 3 July 2009	Mega Virtual
5	PT Bank Negara Indonesia (Persero) Tbk	No. 11/438/DASP - 3 July 2009	UnikQu
6	PT Indosat, Tbk	No. 11/512/DASP - 3 July 2009	IMkas (d/h PayPro d/h Dometku)
7	PT Skye Sab Indonesia	No. 11/431/DASP - 3 July 2009	Skye Mobile Money
8	PT Telekomunikasi Indonesia, Tbk	No. 11/432/DASP - 3 July 2009	Flexy Cash
9	PT Telekomunikasi Selular	No. 11/513/DASP - 3 July 2009	T-Cash
10	PT Bank Rakyat Indonesia (Persero) Tbk	No. 12/691/DASP - 13 August 2010	T bank
11	PT XL Axiata, Tbk	No. 12/816/DASP - 6 October 2010	XL Tunai
12	PT Finnet Indonesia	No. 14/277/DASP - 16 April 2012	Finpay Money (d/h Mobile Cash)
13	PT Artajasa Pembayaran Elektronik	No. 14/327/DASP - 9 May 2012	MYNT E-Money
14	PT Nusa Satu Inti Artha	No. 14/898/DASP - 20 December 2012	DokuPay
15	PT Bank Permata	No. 15/26/DASP - 11 January 2013	BBM Money
16	PT Bank CIMB Niaga	No. 15/119/DASP - 13 February 2013	Rekening Ponsel
17	PT Bank Nationalnobu	No. 15/148/DASP - 26 February 2013	Nobu e-Money
18	PT Smartfren Telecom Tbk	No. 16/85/DKSP - 26 May 2014	Uangku
19	PT Domet Anak Bangsa (d/h PT MV Commerce Indonesia)	No. 16/98/DKSP - 17 June 2014	Gopay
20	PT Witami Tunai Mandiri	No.16/129/DKSP - 18 July 2014	Truemoney
21	PT Espay Debit Indonesia Koe	No. 18/262/DKSP/Srt/B - 29 February 2016	Dana (d/h Unik)
22	PT Bank QNB Indonesia Tbk	No. 19/129/DKSP/Srt/B - 13 February 2017	Doonet
23	PT BPD Sumsel Babel	No. 19/250/DKSP/Srt/B - 13 March 2017	-
24	PT Buana Media Teknologi	No. 19/468/DKSP/Srt/B - 23 May 2017	Gudang Voucher
25	PT Bimasakti Multi Sinergi	No. 19/467/DKSP/Srt/B - 23 May 2017	Speed Cash
26	PT Visionet Internasional	No. 19/661/DKSP/Srt/B - 7 August 2017	OVO Cash
27	PT Inti Dunia Sukses	No. 19/672/DKSP/Srt/B - 10 August 2017	iSaku
28	PT Veritra Sentosa Internasional	No. 20/207/DKSP/Srt/B - 22 May 2018	Paytren

29	PT Solusi Pasti Indonesia	No. 20/209/DKSP/Srt/B - 22 May 2018	KasPro
30	PT Bluepay Digital Internasional	No. 20/286/DKSP/Srt/B - 31 July 2018	Bluepay Cash
31	PT Ezeelink Indonesia	No. 20/210/DKSP/Srt/B - 22 May 2018	Ezeelink
32	PT E2Pay Global Utama	No. 20/208/DKSP/Srt/B - 22 May 2018	M-Bayar
33	PT Cakra Ultima Sejahtera	No. 20/211/DKSP/Srt/B - 22 May 2018	DUWIT
34	PT Airpay International Indonesia	No.20/293/DKSP/Srt/B - 8 August 2018	SHOPEEPAY
35	PT Bank Sinarmas Tbk	No. 20/416/DKSP/Srt/B - 26 November 2018	Simas E-Money
36	PT Transaksi Artha Gemilang	No. 20/477/DKSP/Srt/B - 31 December 2018	OttoCash
37	PT Fintek Karya Nusantara	No. 21/65/DKSP/Srt/B - 21 February 2019	LinkAja
38	PT Max Interactives Technologies	No. 20/454/DKSP/Srt/B - 18 December 2018	Zipay
39	PT Sarana Pactindo	No. 21/261/DKSP/Srt/B - 13 August 2019	PACCash
40	PT Datacell Infomedia	No. 21/354/DKSP/Srt/B - 2 October 2019	PAYDIA
41	PT Netzme Kreasi Indonesia	No. 21/584/DKSP/Srt/B - 19 December 2019	Netzme
42	PT Bank BNI Syariah	No. 21/216/DKSP/Srt/B - 24 July 2019	Hasanahku
43	PT MNC Teknologi Nusantara	No. 21/392/DKSP/Srt/B - 23 October 2019	Spinpay
44	PT Kereta Commuter Indonesia	No. 21/446/DKSP/Srt/B - 14 November 2019	-
45	PT Mass Rapid Transit	No. 21/447/DKSP/Srt/B - 14 November 2019	-
46	PT Astra Digital Arta	No. 22/59/DKSP/Srt/B - 28 January 2020	AstraPay
47	PT Bank OCBC NISP	No. 21/582/DKSP/Srt/B - 19 December 2019	One Wallet
48	PT Rpay Finansial Digital Indonesia	No. 21/586/DKSP/Srt/B - 19 December 2019	Yourpay
49	PT Visi Jaya Indonesia	No. 22/174/DKSP/Srt/B - 9 March 2020	Eidupay
50	PT Bank Jabar Dan Banten	No. 22/156/DKSP/Srt/B - 16 March 2020	Digicash
51	PT Duta Teknologi Kreatif	No. 22/471/DKSP/Srt/B - 26 August 2020	Dutamoney
52	PT BPD DIY	No. 22/482/DKSP/Srt/B - 1 September 2020	Jogja Smart
53	PT Yukk Kreasi Indonesia	No. 22/483/DKSP/Srt/B - 1 September 2020	Yukk
54	PT Jatelindo Perkasa Abadi	No. 22/487/DKSP/Srt/B - 1 September 2020	Fello
55	PT Mitra Pembayaran Elektronik	No. 22/583/DKSP/Srt/B - 3 November 2020	Saldomu

Appendix 3: BI Non-Cash Transaction data

The following table contains data compiled from the BI statistical database, which following a website restructuring, no longer accessible in this form. BI categorises these transactions as ‘non-cash transactions’, which includes transactions made using e-money, ATM/debit cards, and credit cards.

Transaction Volume

	2013	2014	2015	2016	2017	2018	2019
E-money	137,900,779	203,369,990	535,579,528	683,133,352	943,319,933	2,922,698,905	5,226,699,919
ATM/debit card	3,461,149,865	4,077,696,164	4,574,387,633	5,196,512,452	5,693,226,552	6,412,272,532	7,026,962,690
Credit card	239,098,519	254,320,061	281,325,840	305,052,297	327,377,665	338,347,867	349,211,920

Transaction Value in IDR millions

	2013	2014	2015	2016	2017	2018	2019
E-money	2,907,432	3,319,556	5,283,018	7,063,689	12,375,469	47,198,616	145,165,468
ATM/debit card	3,797,370,438	4,445,073,437	4,897,794,435	5,623,912,646	6,200,437,636	6,929,665,962	7,474,823,816
Credit card	223,369,577	255,057,458	280,543,930	281,020,518	297,761,229	314,294,067	342,682,828

(Originally available at: BI, 2020a, 2020b).