Background and Introduction

Many see China as a world leader in the adoption of mobile payments. The early 2000s saw mobile payments gaining popularity in the country. Consumers and businesses rapidly adopted mobile payments using smartphone payment apps at a time when such technologies were still relatively obscure in most countries. The two most popular mobile payment platforms were Alipay and WeChat Pay. Statista Digital Market Outlook, a leading provider of market and consumer data, projected that more than half a billion people in China would use mobile payments in 2019, a penetration rate of 35 per cent—the highest globally (Figure 1).¹

Mobile payments were regulated by the People’s Bank of China (PBC). The authorities monitored the operation of mobile payment platforms, and their security and privacy protections for users. The PBC determined market access for mobile payment companies and enforced strict compliance with regulations. Other stakeholders in this space were goods and services providers (merchants), platform providers (such as WeChat Pay, Tenpay, and Alipay), and customers or users of the mobile payment systems.²

This case study will discuss some drivers of mobile payments adoption in China. It will examine the benefits of mobile payments that made them attractive to stakeholders across the value chain; and, how China became a global leader in mobile payments.
Figure 1: Projected user penetration in the mobile point-of-sale segment in 2019
(Source: Statista, https://www.statista.com/chart/17909/pos-mobile-payment-user-penetration-rates/)
Note: The average annual transaction value per user was found to be the highest in the U.S.

The Emergence of Mobile Payment Systems

The last twenty years witnessed rapid growth in global adoption of mobile phones, which served as basic platforms for the development of mobile payment systems that enabled faster and safer transactions. Advance Tech, a Hong Kong-based company that invented the “mobile payment system” in 2000, described its invention this way:

*The present invention relates to a remote, secured, prompt and accurate payment system, and more particularly to a mobile payment system and method thereof, wherein the customer's payment is verified by sending confirmation back to the customer's device, so as to prevent passing any personal confidential information such as credit card numbers, customer's name and signature to the merchant.*

The company’s payment system bridged transactions between merchants and the customers through its own third-party operation centre. As the operation centre and platform provider, Advance Tech tokenized each registered customer and merchant. After authenticating their corresponding identities with passwords, the operation centre would signal the two parties to proceed with the payment transaction. See Exhibit 1 for the interactive methods of Advance Tech’s system.
Today, operators of mobile payment platforms included cellular service providers, banks, third-party platforms, and hybrid platforms.\textsuperscript{4}

Following its invention, global adoption of mobile payments grew quickly. In 2003, 95 million people paid for online purchases with their cell phones, and this number grew to 448 million in 2016.\textsuperscript{5,6} Major technology companies including Apple, Google, PayPal, AT&T—and many other start-ups—now battled for dominance in the mobile payments space.

**The Rapid Development of Mobile Payment System in China**

In 2017, Chinese state media started to promote the concept of China’s “new four great inventions”, these being mobile payments, e-commerce, bullet trains, and the sharing economy (particularly in the form of bicycles). The goal of this concept was to create a positive image of China and the country’s commitment to rapid scientific and technological development. However, it should be noted that the Chinese were not actually inventors of these technologies and business models, even if they did play a leading role in their promotion and application, mobile payments being a particularly good example of this.

Despite adopting smartphones later than the U.S. or Europe, China experienced rapid growth in the number of mobile payment users and the mobile payments market (Figure 2). In 2017, the total value of mobile payment transactions exceeded RMB150 trillion, an almost ten-fold growth in just five years. Also, over 30 per cent of all payments in China were conducted on mobile platforms or with mobile financing. It became clear that the mobile payments had transformed the habits, behaviours, lifestyles of the Chinese, who were increasingly accustomed to a cashless society.

**Some Possible Reasons of the Rapid Development of Mobile Payments in China**

Analysts suggested various possible reasons for the rapid proliferation of mobile payments,\textsuperscript{7} with views differing between stakeholder groups. Regulators suggested the PBC’s regulatory ability as a critical success factor; platform providers identified the security of their systems as key; consumers liked the convenience and low transaction fees; and merchants said that the broad user base made mobile payments attractive.

**Regulators**

In 2010, the PBC announced the *Procedures for Non-Financial Institution Payment Service*, which officially signalled the government’s oversight of third-party mobile payment platforms and regulated market access for non-financial institutions. Since then, the PBC issued over 230 licenses to qualified corporations including well-known conglomerates such as Alipay,
WeChat Pay and Union Pay, as well as many other small- and medium-sized enterprises. The PBC used these time-bound licenses to eliminate corporations with unsatisfactory financial management performance. Nine out of ninety-three in 2017 and four out of twenty-five corporations in 2018 failed to extend their licences because of mismanagement, either of client accounts, transaction security, or risk monitoring. In April 2018, the Payment and Clearing Association of China also warned large corporations to improve their self-regulation and to strictly follow PBC regulations. Thus, the PBC was an effective regulator of mobile payments in China.

**Figure 2:** Transaction value of the third-party mobile payment systems (banks excluded)
(Source: Payment and Clearing Association of China, people.cn)

**Platform providers**

As mentioned above, platform providers can be generally classified into several categories, these being cellular service operators, banks, third-party platforms, and hybrid platforms. Before the PBC announced the *Rules on the Administration of Payment Services Provided by Non-Financial Institutions* in 2010, state-owned banks and major private banks dominated the mobile payments space. In contrast to third-party platforms that found it challenging to build customer trust, banks already had well-established brands and government support, along with large numbers of existing clients and their detailed transaction information. These banks only lacked their own mobile payment platforms.

Despite their dominant position, banks decided against banding together to create a mobile payment cartel, and instead opted to work with third-party payment platform providers under equitable, profit-sharing arrangements. This was essential to the survival—and continued growth of—these third-party systems. This cross-category cooperation allowed third-party
providers to rely on banks to do the critical work of identity verification and transaction settlement. Transactions made with debit/credit card information stored on third-party mobile payment systems allowed both the platform providers and the banks that issued the cards to track, record and secure the transaction because of it was compulsory to register bank accounts with real identities.

This synergistic outcome could be partly attributed to the administrative decisions of Chinese policymakers, but also significant was the fact that this arrangement was highly profitable for the banks, which pocketed more transaction fees when customers switched to cashless payments.

The perceived reliability and stability of the mobile payments space also contributed to their popularity. In recent years, although the PBC officially licensed over 210 mobile payment platform providers, the market became increasingly dominated by the Alipay/Tenpay duopoly (Figure 3).

It should be noted that these two mobile payment brands were both managed by their parent companies. Alipay, a subsidiary of the Alibaba Group, one of the world’s largest ecommerce companies, was developed in 2004 to facilitate online payments on Taobao, Alibaba’s online shopping platform. This happened long before the PBC started licensing third-party mobile payment systems. Tencent, a technology company, similarly established Tenpay in 2005 and expanded it to various social media platforms including QQ and WeChat after 2013. Compared to new start-ups with limited coverage, strong technological support from Alibaba Group and Tencent made it easier for their respective platforms to dominate the market.

**Consumers**

Consumers found it easy to trust and adopt these new payment platforms because they already had pre-existing, sometimes captive, relationships with Alipay and Tencent Financing. These new mobile payment platforms were closely connected to their parent companies’ other products and services. Customers only needed to enable the mobile wallet function within their social media apps or connect their mobile wallets with online shopping platforms, which was easy and costless.

Another important factor in the rapid consumer adoption of the mobile payment systems was the small number of credit cards users in China. According to the PBC, the number of credit cards per capita in China was merely 0.39 in 2017, much smaller than that of Hong Kong (2.5) or the U.S. (2.9). However, the number of debit cards per capita in China was much larger at 4.4. Consumers found that mobile payments solved the problem of their lack of credit cards, and were a good alternative to cash.
Figure 3: Market shares of the Chinese third-party mobile payment systems
(Data source: Analysis, https://www.analysys.cn/)

In addition, the major mobile payment systems provided multifunctional transactions, which were more convenient and user-friendly. Built-in mobile wallets could aggregate multiple credit or debit cards and were secured by the platform providers and the banks. Besides, payments with mobile wallets were faster and more convenient than physical cards. Payment settlement with mobile wallets was immediate, as opposed to the several hours or days it took with credit cards. Moreover, QR codes enabled instantaneous person-to-person (P2P) transactions. In contrast, credit cards relied on legacy systems and processes that were much slower. With the recent development of the Near Field Communication (NFC) technology, mobile payment systems also began to see adoption within public transport systems (e.g. Shenzhen Metro). Mobile payment systems and consumer satisfaction reinforced each other in a virtuous circle: Technological advancement improved customer satisfaction and usage, which in turn incentivised platform providers to develop more applications. This contributed significantly to the adoption of mobile payment systems in China.

Summary

The adoption of mobile payments grew rapidly in China. Different players along the value chain put forward a myriad of reasons for this rapid growth, such as government regulations, support from major platform providers who identified mobile payments as a business opportunity, and the enthusiasm of consumers for whom mobile payment was a more convenient alternative to credit/debit cards. The Chinese government, specifically the PBC, encouraged the development of mobile payment systems. While the banks were one of the first to use mobile payments, they subsequently established mutually beneficial, cooperative relationships with third-party platform providers. Two technology giants in China took
advantage of this opportunity to launch mobile payment platforms—Alibaba with AliPay; Tencent with WeChat Pay and TenPay. While there were many other smaller government-licensed platform providers, Alibaba and Tencent dominated the mobile payments market. This was largely due to the fact that Alibaba and Tencent had large, loyal customer bases that found it easy to transfer their trust to the companies’ respective payment platforms. The perceived low opportunity costs and reliable technologies proved attractive to users, who also welcomed mobile payments as a quick and convenient way of making P2P transfers, and a good substitute for hard-to-get credit cards.
Exhibit 1: Interactive Methods of the Mobile Payment System

The customer-merchant-provider relationship forms a basic triangle of the mobile payment system at the core of the payment transactions. Models of interactions generally include:

1. **Card-based systems.** Card-based systems can be considered the most primitive mobile payment method, since they derive from the physical cards exclusively connected with issuing banks. The payment process also requires customers to fill in detailed information to ensure security.

2. **Mobile wallets.** Compared with the separate card-based systems operated by the banks, the mobile wallet can aggregate multiple physical cards, coupons, and other information to make transactions more efficient. Mobile wallets can also maintain their own balances independent of physical cards or other payment systems.

3. **Carrier billing.** Instead of requiring pre-registration or credit/debit card information, the carrier billing charges purchases to the cell phone bills of customers. In most cases, this payment method is secured by the two-factor authentication, whereby customers are required to input both a PIN and a One Time Password (OTP).

There are two subdimensions that further elaborate these basic forms of interactive methods (See Table 1).

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Point-of-sales (POS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS-dependent; hardware (e.g. Square, LevelUp)</td>
<td>POS-independent; hardware (e.g. Apple Pay, Samsung Pay)</td>
</tr>
<tr>
<td><em>Technology: NFC</em></td>
<td><em>Technology: NFC or QR Code</em></td>
</tr>
<tr>
<td>POS-dependent; software (e.g. PayPal)</td>
<td>POS-independent; software (rare)</td>
</tr>
<tr>
<td><em>Technology: QR Code</em></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Two subdimensions of the interactive methods
Different technologies can also be utilised within these subdimensions, prominent examples being QR codes and NFC:

1. **QR codes.** QR codes can encode information from multiple sources such as websites, text, and images; and can be either printed in hardcopy or stored on mobile devices, making transactions independent of POS systems.

2. **NFC.** This technology allows contactless transactions to happen once customers place their smartphones near an NFC reader module, and doesn’t require the involvement of a POS system. Since this method does not require customers to input their PIN to unlock mobile wallets or bank accounts, it speeds up transactions in physical stores and opens up the possibility of using smartphones to travel on public transport.

**Figure 4** presents a simplified framework for mobile payment systems. As discussed, customers and the merchants are connected by the platform provider in the mobile transaction system, in which the card-based systems and mobile wallets were the earliest methods for online transactions. QR codes and NFC technologies further expanded the scope of the applications of these initial methods.

![Figure 4: A simplified framework for mobile payment systems](image-url)
Endnotes


2 Other stakeholders may also include employees, creditors and tax authorities who may influence the decision-making of the platform providers.


8 Fei Jin Rong Ji Gou Zhi Fu Fu Wu Guan Li Ban Fa (Rules on the Administration of Payment Services Provided by Non-Financial Institutions), promulgated by PBOC Decree No. 2 on 14 June 2010, effective on 1 September 2010. The Chinese official version of the Rule is here: http://www.gov.cn/flfg/2010-06/21/content_1632796.htm and a translated version is available at: http://www.lawinfochina.com/Display.aspx?lib=law&Cgid=134238

9 Fei Jin Rong Ji Gou Zhi Fu Fu Wu Guan Li Ban Fa Shi Shi Xi Ze (Measures on the Implementation of the Rules on the Administration of Payment Services Provided by Non-Financial Institutions), promulgated by PBOC Decree No. 17 on 1 December 2010, effective on the same date. The Chinese official version of the Rule is here: http://www.gov.cn/gzdt/2010-12/03/content_1759169.htm; and a translated version is available at: http://www.lawinfochina.com/display.aspx?lib=law&id=8564&CGid.


12 Near field communication is a set of technology communication protocols that uses radio frequencies to enable two electronic devices to establish communication by bringing them within very close distance. A transaction is conducted by waving a mobile device near another electronic device.

13 Falk et al., How mobile payment influences.