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# Mobile payments: Finland compared to China

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Opinnäytetyön tavoitteena oli selvittää mobiilimaksamisen tilannetta Suomessa ja Kiinassa. Muina tavoitteina oli selvittää, miten tilanne on kehittymässä kummassakin maassa ja mitkä tekijät vaikuttavat kehitykseen. Pyrkimys oli myös selvittää, onko Kiina jo siirtymässä toisenlaiseen maksujärjestelmään.

Suomessa nykyinen pankkikortteihin perustuva järjestelmä on helppokäyttöinen ja turvallisen tuntuinen kuluttajille. Saatavilla olevat mobiilimaksamispalvelut ovat vaikeaselkoisia kuluttajille verrattuna selkeään korttikulttuuriin. Markkinoilla ei ole työntöä siirtyä mobiilimaksamiseen niin nopeasti. Toisaalta Kiinassa mobiilimaksaminen on kätevämpi vaihtoehto. Verrattuna pankkikorttijärjestelmiin mobiilimaksuja varten syntyi yhdistämällä palveluita laaja ekosysteemi, joka on myös edullinen käyttäjien kannalta.

Monet asiantuntijat ennakoivat, että mobiilimaksaminen tulee tekemään läpimurtonsa Suomessa, mutta kukaan ei osaa sanoa, milloin tämä tapahtuu. Kiina taas näyttää jatkavan yhä tehokkaampien maksumenetelmien kehittämistä, esimerkkinä mainittakoon maksaminen kasvojentunnistuksen avulla.

Avainsanat: Mobiilimaksaminen, Mobile Pay, Alipay, WeChat Pay

SEINÄJOKI UNIVERSITY OF APPLIED SCIENCES

**Thesis abstract**

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The goal of the thesis was to find out the situation of mobile payment both in Finland and in China. The other goals were to find out how the situation was developing in both countries, and what factors influenced that development. There was also the aim to find out if China is already moving on to a payment method of another form.

In Finland, the current card-based system is convenient and comfortable for consumers to use. By contrast, the available mobile payment services are obscure for consumers compared to the clear-cut card culture. There is no push to quickly move on to mobile payment. In China, on the other hand, mobile payment is a more convenient solution. Compared to cards, mobile payment became a vaster ecosystem by unifying functions and services, while being inexpensive for its users.

Many experts predict that mobile payment will have its breakthrough in Finland, but no one can say for certain when that will happen. China, on the other hand, seems to be developing even more efficient payment methods; an example of this is the facial recognition payment method.

Keywords: Mobile payment, Mobile Pay, Alipay, WeChat Pay

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## Terms and abbreviations

| | |
|---|---|
| **ISP** | Internet service provider |
| **MIIT** | Ministry of Industry and Information Technology |
| **SME** | Small or Medium-sized enterprise |
| **POS** | Point of sale |
| **p2p** | person-to-person |
| **b2b** | business-to-business |
| **b2c** | business-to-consumer |
| **FRP** | Facial recognition payment |
| **nfc** | near field communication |
| **mst** | magnetic secure transmission |

# 1 INTRODUCTION

The author of this thesis was first introduced to mobile payment when visiting China in the year 2016–2017. Mobile payment was available in a large scale, from the largest shopping malls with high-end retailers to small street food merchants. Mobile payment was part of everyday life for the locals. In Finland this is not the case. Paying with mobile is possible in Finland but has not yet gained wide popularity.

Mobile payment is an up-and-coming form of payment. Yet its progression has been different around the world. The country leading in using the method is China. The Chinese market and internet are a world of their own since their internet is isolated from the rest of the world's internet.

## 1.1 Purpose of the research and research questions

The thesis researches the situation of mobile payment in Finland and in China. The goal is to highlight factors in each of the countries that have and are influencing mobile payments popularity and to discover areas in which they differ from each other. China is vastly different compared to Finland, not only in market size, but also geopolitically and culturally.

There is also the possibility that China is already moving on to something new regarding payment methods while Finland is yet to grasp mobile payment.

- What is the situation now?
- How is it developing?
- What factors into mobile payments' development becoming more common?
- Is China already moving on to a different kind of payment method? What is said method?

The writer decided on the topic due to their own experiences abroad and curiosity on the subject. The thesis was not commissioned.

## 1.2 Methods and the structure of the thesis

The thesis is made as a literature review. A publication by the University of Vaasa (Salminen 2011, 6) introduces three types of literature reviewing: descriptive review, systematic review, and meta-analysis.

Descriptive review is the most used form of literature review, which can be described as an overview without strict rules. The used materials are vast and not restricted by methodical rules. The phenomenon being studied can however be described pervasively and the attributes linked to the phenomenon can be categorized. The descriptive review is its own independent method, but it can provide new phenomenon to be studied for the systematic literature review. Descriptive review can further be defined in two orientation: narrative and integrating overview. Especially the integrating overview has multiple confluences with the systematic literature review. From a methodical point of view the narrative literature review is the lightest of the literature reviews. It offers a wide picture of the topic or describes the topic's history and development. Disconnected information is organized into a continual event. The narrative overview aims for a conclusion that is at same time easy to understand. (Salminen 2011, 6-7)

A narrative literature overview has three methods of execution: editorial, commentary and survey (Salminen 2011, 7). For editorial review, the chief editor of a publication or a visiting writer preforms a short literature review that supports the themes of the main article or newspaper. The purpose of commentary overviews on the other hand evoke discussion and it is not a strict method for the one using it. However, the result may turn out biased. The writer's own contribution is in the forefront instead that the review would be objective and speaking for itself.

The most comprehensive method of execution is the survey, and is what people usually mean when they talk about literature reviews. The process is much more extensive compared to the other two methods. The purpose is to summarize already existing studies. In principle the material gathered through a narrative literature review has not been through especial scrutiny. Still, it is possible to make conclusions using the method. The tone of a narrative literature overview can also sometimes

be critical, even though criticalness is not the default value of a review. (Salminen 2011, 7)

Integrating literature reviewing is used when you want to describe the phenomenon under study with as diversity as possible. It is a way to produce new information on topics that have already been studied and helps in scrutinizing and critically evaluating the literature being used. (Salminen 2011, 8)

According with the nature of a literature review the thesis focuses on providing an introduction and overview into mobile payment. Lastly there will be analyzation of the standout factors and open questions that turned up during the writing process.

Because mobile payment is a relatively new and a constantly evolving phenomenon there is not much printed publication aside from articles in newspapers and magazines. Due to the nature of the subject the information on printed material can become outdated quickly. Information used from printed media will be practical information regarding mobile payment. There most likely has been change in statistics, regulations, and service providers.

Most of the information used in this thesis comes from online sources. These sources can stay up to date regarding latest information. However heavy scrutiny should be practiced regarding these sources. Some of the sources might become unavailable over time.

The thesis starts with the introduction. Chapter 2 is focused on describing mobile payment and bringing up some of it is benefits and shortcomings. Next, in Chapter 3, there is an overview of the Finnish market regarding mobile payment. In Chapter 4 that there will be an overview of the Chinese market. Chapter 5 is dedicated to analysis and lastly Chapter 6 has the summary of the thesis.

## 2 THEORY

In this section there is groundwork information about mobile payment. It also highlights some of its benefits as well as some concerns regarding the payment method.

### 2.1 New methods, same principle

The ways people pay are affected by cultures, innovations, habits, and the technology available at the time. Besides innovation, the banking sectors and business are aiming to provide multiple different payment methods to meet customer preferences. (Keates [27.10.2020])

The forms of payment have changed and continue changing over the years, but the main purpose of paying for something remains the same. Payments are not the main business of a store; their main purpose is to provide products and services. The payment process should aid the store in trade and due to this, should be fast and cost-efficient. From the customer's point of view, the payment process should be as convenient as possible. The most essential thing for the customer is that the form of payment they use is accepted and that the process is safe, fast and it does not cause other expenses for the customer. (Laakso 2018, 47)

With an increase in payment service providers, payment itself has become more fragmented (Laakso 2018, 48). Laakso points out that new forms of payment will not increase sales for a store unless they can bring in entirely new customers for the store. According to Laakso, merchants should consider how much additional sales implementing a new payment method would bring or if they will lose sales if the method is not implemented.

If the customer feels that using the new payment method is challenging, if it is not widespread enough to cover the stores used by the customer, or if the new method brings no additional value compared to previous payment methods, it is easy for the customer to dismiss the new method and continue using the old familiar one. Customers usually dislike uncertainty and do not want to cause extra inconvenience in the cash register queue. (Laakso 2018, 49.)

According to Mia Laakso of SOK Rahoitus (2018), the key for a payment method to become utilized is its distribution. Both stores and consumers must be ready at the same time. The one to win among the service providers is the one who manages to make both introducing and operating the payment method easy for both consumers and stores. The new method must genuinely bring additional worth compared to the old methods.

In the coming decade, the use of mobile payments will increase significantly, leading to the depletion of bank cards. Although, the process will be different in different countries. In emerging markets, customers most likely transition straight from cash to mobile payments, skipping the wide use of bank cards. (Keates 2020)

## 2.1 Defining mobile payment

A mobile payment is a transaction of money made for a product or service through a portable electronic device such as a cell phone or a tablet (Grant 9.6.2019). Mobile payment can mean for example contactless payment at a cash register or sending money to a friend using an app (Smeds 3.4.2018).

There are multiple mobile payment applications available for the consumers. They work a little differently from each other, but all in all, paying with your phone happens in two stages. First, the user logs in into the application either with a code or a fingerprint. This identification is done to make sure that the user has the authority to make the purchase. Then in the second stage, the money is collected from a charge card or the user's bank account. (Smeds 3.4.2018)

 Payment information is encrypted during transmission, so it is thought of as being a safer payment method than paying with a debit or credit card (Grant 9.6.2019).

Mobile payments began their popularity in Asia and Europe before becoming more common in the United States and Canada. In the early days, mobile payments were sent by text message. Later, as technology developed, this allowed for pictures of checks to be taken via cell phone camera and sent to the payment recipient. This technology later morphed into mobile check deposit capabilities for banking apps. (Grant 9.6.2019)

## 2.2 Benefits of mobile payment

In the following there will be some highlighted aspects on how mobile payment holds different benefits compared to other payment methods.

### 2.2.1 Increased security

First benefit of mobile payment is that it makes a physical wallet unnecessary. Without the need to reach out for physical money not only saves time but also is a safety matter, as people are unable to peek into your wallet or purse. (Grant 9.6.2019)

Individually generated codes for each transaction and fingerprint scan are also more secure than using a credit card. Shop clerks and merchants seldomly check identification, so mobile payment adds a layer of safety measures against fraudulent activity. Using mobile payment also enables a new level of personal privacy, as people will not be able to tell what kind of card is being used. (Grant 9.6.2019)

### 2.2.2 Maneuverability and real-time transactions

Accepting payments electronically was not practical for on-the-go businesses, and so using cash was the norm. Commerce is no longer tied down and can take place almost everywhere. Customers expect to be able to use their bank cards and eWallets wherever they shop. (Worldpay Editorial Team 9.7.2019)

Mobile payments happen in real-time, so the balance of the account is always up to date. With bank and credit cards, the balance of the account is updated when the payment is collected from the customers' bank accounts, usually within one or two business days. Customers have begun to get used to and demand real-time services. (Laakso 2018, 48)

## 2.3 Concerns regarding mobile payment

One of the main factors discouraging consumers from using mobile payments is the customer's concerns with security. Some people do not want to store sensitive information on their phone and furthermore transmit that sensitive information to a merchant's device. (Tode [ref. 6.2.2021])

In the following there will be examples of the downsides and concerns of using mobile payment.

### 2.3.1 Losing your device

A person's mobile phone contains names and contact information of many important people in a person's life, photos, and social media apps. If the phone also has a mobile wallet, this can provide access to a person's credit and bank accounts. Forgetting or dropping the device somewhere, for example a restaurant or airport, results in the high risk losing and exposing considerable amount of personal information. (CreditCards.com. 14.12.2017)

### 2.3.2 Cyberthieves

One example of cybertheft regarding mobile payment is Sim swapping, which relies on mobile based authentication. In a sim swap scam, criminals hijack a persons' cell phone number and thus gain access to their personal information and accounts. Scammers take advantage of a weakness in the two-factor verification process, namely the verification text message or call. Scammers call the victim's mobile carrier and impersonate the victim. They can gather security information about the victim through malware, phishing emails, or social media. They will then ask the service representative to activate a new SIM card that is in the scammer's possession. This ports the victim's phone number to the scammers. Once they have the victim's phone number, they can access the victim's communications and text-messages. The scammers can then change passwords for the victim's accounts. They can also

set up a new bank account in the victim's name and transfer the money from the victim's original account. (Johansen for NortonLifeLock [ref. 23.2.2020])

According to Johansen, sim swapping is one of the reasons why using a mobile number for authentication might not be such a good idea.

### 2.3.3   Malware

Malware can gain access to a device by clicking a suspicious ad or a fake link sent by a malicious third party. Commonly computers are more at risk compared than mobile phones, but malware for cellphones are growing as a threat. For example, a malware called Faked token can overlay banking and other apps that evokes Android users to enter their payment card information. Due to Apple's quality control for apps, IPhones are less likely to be attacked by malware, but they are still not completely secure. (CreditCards.com. 2017)

### 2.4   Mobile payments compared to cards and cash

Service providers have not given a good enough reason for consumers to use their smartphones for making purchases. Many consumers site that they see no point in switching away from cash or cards. (Tode [ref. 6.2.2021]) However, Tode's article points out that the retailers that are making preparations in incorporating mobile payments into their systems gain an advantage over those who do not, winning over the shoppers who make the transition to a cashless and bank cardless lifestyle.

### 2.5   Effects of COVID-19

During the Covid-19 pandemic, transactions have increasingly moved online as physical stores have been forced to close. Contactless payment is considered more hygienic and so a safer way of payment, the adoption of this payment method has

been projected to increase between +6% to 8% compared to pre-COVID-19 predictions. People seek to avoid handling cash, pens, and keypads for the sake of cleanliness, and favor alternative quick and safe payment methods. (Keates 2020)

## 3 THE FINNISH MARKET

Currently there are many mobile payment options on the market of which none have made a significant breakthrough in Finland. The different banks and other operator's services function as their own separate ecosystems. Some of the services work with NFC, in which the bank card information is read from the phone like it was a bank card. Others work with Bluetooth; in which case the payment terminal must support the Bluetooth connection. It is hard to tell what payment service works, with what device and where, making it very confusing for the consumers. (Laakso 2018, 48-49)

Mia Laakso (2018, 49) from SOK Rahoitus is of the opinion that for mobile payment to gain more mainstream popularity in Finland, the solution needs to be widespread and convenient enough. To reach the critical amount, one service must function on different phone models, function in brick-and-mortar shops as well as online shops, and to cause no massive changes for the retailer's cash register systems. According to her, it would be beneficial to standardize and regulate mobile payment if it would make adapting new forms of payment more efficient. Without common technological interface and common practices, the development resources are tied in the implementation of new payment methods. Not many stores have the time or money for constant equipment upgrades or for manual reconciliation.

### 3.1 Versatile yet obscure selection

Instead of a unified front, the market is filled with separate service providers all working in their own facets. The divide forms due to different bank and device requirements. (Ollila 2018, 63)

Mobile payments utilize either Bluetooth or NFC technology (Slot 30.11.2019).

– Samsung Pay does not currently work in Finland. Among the Nordic countries it is only available in Sweden. Elsewhere in Europe it works in France, Italy, Spain, Switzerland, Russia, and the United Kingdom. (Samsung 21.12.2020) Samsung pay uses NFC and MST technology. MST enables using mobile

payment in places where contactless payment is not supported by the payment terminal. (Slot 30.11.2019)

– Google Pay was first published in the United States in 2015 and arrived in Europe in 2016. At the start in Europe Google Pay was only available in Belgium, Ireland, Great Britain, and Poland. It reached the Nordic countries in 2018. Google Pay's systems use NFC technology. (Slot 30.11.2019)

– Apple Pay was made available on the Finnish market in October 2017. It works on every payment terminal and supports bank cards of Nordea and St1's Mastercards via the Wallet app. (Slot 30.11.2019)

– Pivo is a mobile payment solution of Osuuspankki bank. It is possible to use Osuuspankki's cards with the Android Pivo. (Slot 30.11.2019)

## 3.2   Northern peers

The first of the Nordic countries to launch a peer-to-peer mobile payment app was Sweden in late 2012, with an app called Swish. The next year, 2013, Denmark followed Sweden's lead by launching MobilePay. MobilePay was introduced to the Finnish market the same year. Norway brought the app Vipps to their market in the year 2015. (YouGov [ref. 9.10.2020])

Finland has the smallest rates of mobile payment usage when comparing to the other Nordic countries. According to YouGov's ([ref. 9.10.2020]) research, half of the Finnish adult population (52%) use mobile payment apps from time to time, while 48% never use any of them. From their base group of 982 Finnish adult mobile payment app users, 34% used the app at least once a week, while 59% used mobile payment once a month or less.

Unlike its Nordic neighbors, Finland does not have a clear market leader in mobile payment. The largest market share is held by MobilePay with 20%, followed by Paypal with 15%. (YouGov [ref. 9.10.2020])

As displayed by the statistics table provided by YouGov (2020), there is not much difference between the usage of those who do use mobile payment apps. However,

Finland has considerably more people who do not use mobile payment apps at all compared to other Nordic countries. Based on the information, the other Nordic countries also have clear preferred service providers on their markets.
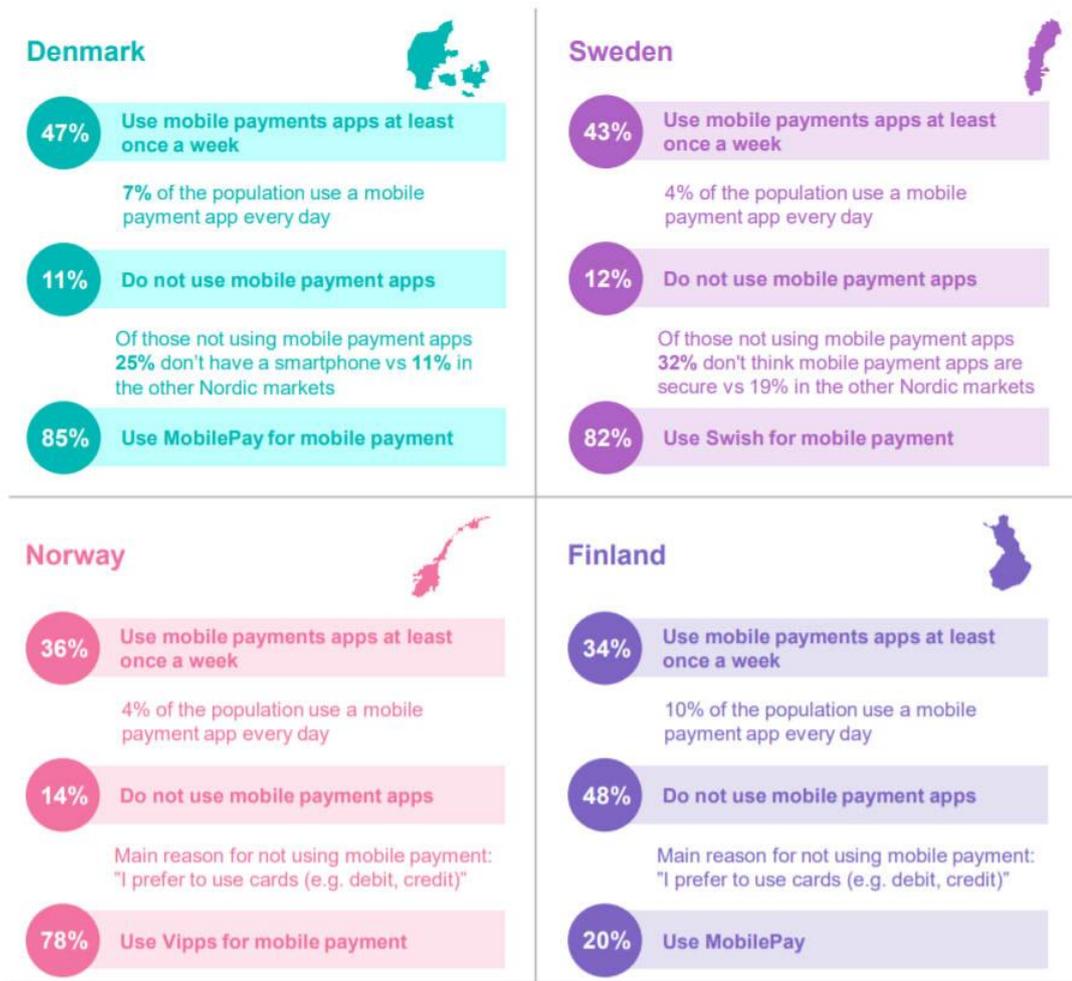


Figure 1. Nordic overview (YouGov 2020).

## 3.3 MobilePay

MobilePay app was brought to the markets in the year 2013. It was published by Danske Bank in May in Denmark. It arrived at Finland in December of the same year. During the first month the app had been downloaded 100 000 times. In the year 2016 a handful businesses working in Finland had integrated MobilePay as a way of payment, among these businesses were McDonalds, Finnkino and Pizza-Online. MobilePay Finland Oy became its own corporation in Finland in the year

2018. The same year MobilePay began partnership with the Finnish railway company VR and with Wolt, a food delivery app. (MobilePay 2020, [ref. 10.11.2020])

MobilePay reached the number of 1.5 million users in the fall of 2020. From the January to the August over 775 million euros were transacted. Compared to the previous year there has been 94% growth in transactions and 115% in volumes. MobilePay considers that its services are suitable for everyone and are working on making it appeal to the wider public. It first started its popularity among young adults, but during 2020 it has gained more traction among older generation as well, especially among 35-44-year-olds. The service provider considers that the main reason for this growth is the 2020 pandemic, which drastically affected the way consumers behave on the market. This included payment methods. The use of cash has declined, and the digital ways of payment are on the rise. (MobilePay 2020)

## 4  THE CHINESE MARKET

Paying with mobile phones has become a daily phenomenon in China over the past few years. Daxue Consulting (2020a) refers to a survey, which reveals that in 2018 92% of the inhabitants of China's largest cities use Alipay or WeChat Pay as their main form of payment. Rural areas report the regularity of the use of mobile payments by the population is 47%. The People's Bank of China released statistics in early 2020, that the number of electronic payments the country's banks have processed has increased by 6.3% compared to 2018. 776.08 million people were using mobile payment in China in March 2020. (Daxue Consulting 2020b)

China's development in payment methods has progressed differently compared to other countries. When other countries moved from cash to credit cards and are now moving on to mobile payment, China skipped the use of credit card and therefore was able to quickly adopt mobile payment. Compared to other mobile payment service providers, for example Apple Pay, sellers do not have to invest in technology to receive payments. In China, a QR code printed on a piece of paper is enough. (Daxue Consulting 2020b)

Progress has been to such an extent, that physical wallets have become old fashioned. Most cash transactions come from foreigners. (Kuzmina 2018) The wallet-free lifestyle is mainly due to QR-code scanning; the customer can scan the QR-code of a shop and pay for the purchase via their phones. (Liu 2020)

Another thing to be taken to account is the data these services are collecting of the consumer, such as location data and other behavioral information. They could become more tied to a person's identification. (Kuzmina 2018)

The graph presented by Daxue Conlusting (2020) show the dramatic change in the preference of payment methods on the Chinese market.
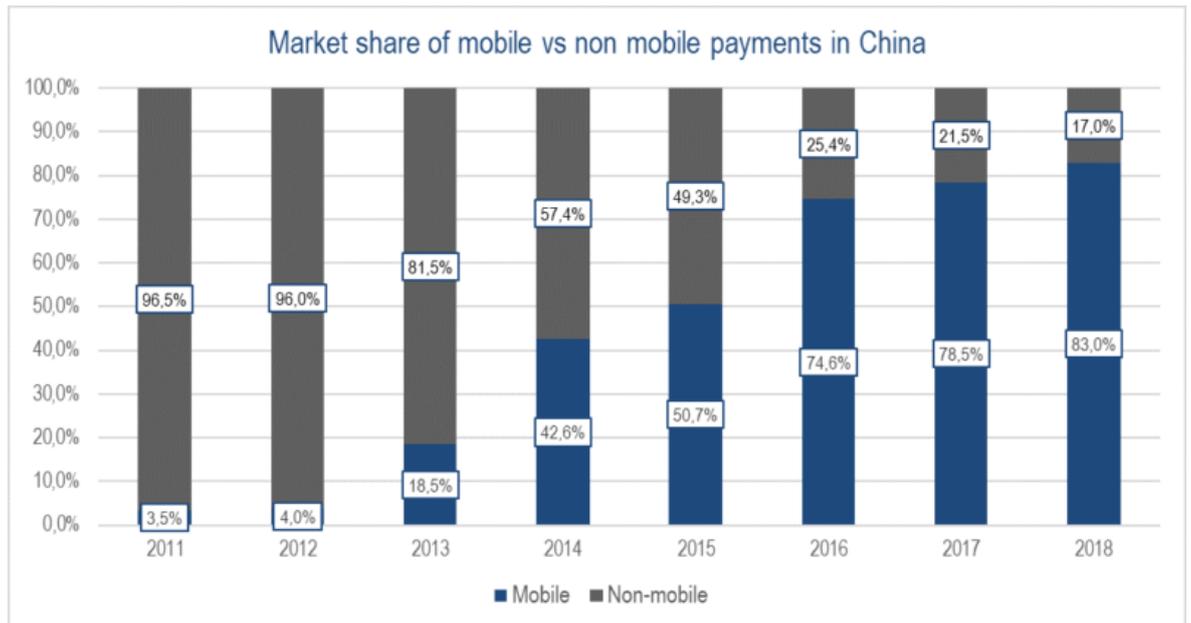
Figure 2. Mobile Payment in China (Daxue Consulting 2020).

## 4.1 China's internet censorship

According Daxue Consulting (2020a), of China's 1.3 billion citizens nearly half use the Internet. The Chinese government has full control over the Internet, media, and news in mainland China. Overall, over 10 000 websites are blocked in China, including major media platforms such as Youtube, Facebook and Twitter. Internet censors are monitoring and deleting all microblog posts, messages and user accounts that discuss banned political, social, and religious topics. Recently however the censorship has expanded to apolitical spaces such as online music stores, live streaming, celebrity gossip and blockchain technology. Real-time communication is now under even more scrutiny.

The Internet access in China is provided by eight ISPs. The Ministry of Industry and Information Technology (MIIT) is responsible of licensing and controlling these ISPs. They are considered the backbones of the Chinese internet and their purpose is to control access to the global internet. (Daxue Consulting 2020a)

Yet still, most of the internet censorship does not happen on the ISP level, but on individual platforms. Chinese companies must themselves be vigilant in monitoring, thus Chinese super apps such as WeChat are built to allow censorship. WeChat, a

multipurpose social media app, has implemented artificial intelligence to scan and remove images that are considered banned content. (Daxue Consulting 2020a)

## 4.2  A system based on QR codes

The reason why mobile payments have been greatly successful in China is because they are simple and fast. The speed is possible because of QR codes. QR codes are widespread in China. According to Daxue Consulting even street musicians have QR codes for collecting money. (Daxue Consulting 2020b)

Quick response code, more commonly known as QR code, is a two-dimensional type of bar code. It is used to access online information through a barcode reader in a digital camera on a tablet or smartphone. The bar code usually contains a link to a webpage, calls a number or sends a text message. Originally the codes were used for inventory tracking and a separate reader app was required, but starting with iOS 11 and Android 8.0, most mobile device cameras are equipped with a reader.  Static QR codes are used to distribute information to the public for example through billboards, posters, or ads. The one who created the code can keep track about how many times their code has been scanned. Dynamic QR codes are more versatile; they can be edited whenever and target individuals for customized marketing. These codes contain more metadata to make tracking easier. QR codes are a low-cost way to build up b2b and b2c communication. (Rouse [ref. 10.12.2020])

Using a QR code to pay in China has two versions:

– The customer scans the merchant's code. The QR code is frequently in printed form and displayed at the checkout, restaurant tables or in some cases the product itself. The customer must select the amount of money they can then send straight to the seller.

– The merchant scans a QR code showing on the customer's smartphone. In this method it is up to the seller to select the amount of money that will deducted from the customer, making it faster and simpler for the customer.

(Daxue Consulting 2020a)

## 4.3   Alipay

Alipay, also known as Zhi Fu Bao 支付宝, first appeared in the year 2004. Originally it was an escrow system on Taobao. Over the years it evolved, partnered with major Chinese banks, and now has tens of millions of users. (Kuzmina 2018)

What an individual needs to use Alipay is a valid mobile phone number, a bank card and to download the app from Alipay's website. Multiple cards can be added on the app, but the system requires at least one Chinese bank card. (SMSH 2020)

Up to this point, there were many Chinese SME who could not afford card readers could only accept cash. Printing the QR-code is simpler and less expensive than to acquire card readers and other equipment. This makes it more convenient for the Chinese SME to use. As an extra benefit all transactions are treated as p2p, where there is 0% commission. Alipay was quickly implemented in different areas of financial services, such as digital banking, ticket purchasing, marketplaces, taxis, and delivery services. (Kuzima 2018)

The following Figure 3. presents the option menu of Alipay and the scannable QR-code for reference. Figure 4. presents the process of the payment workflow.
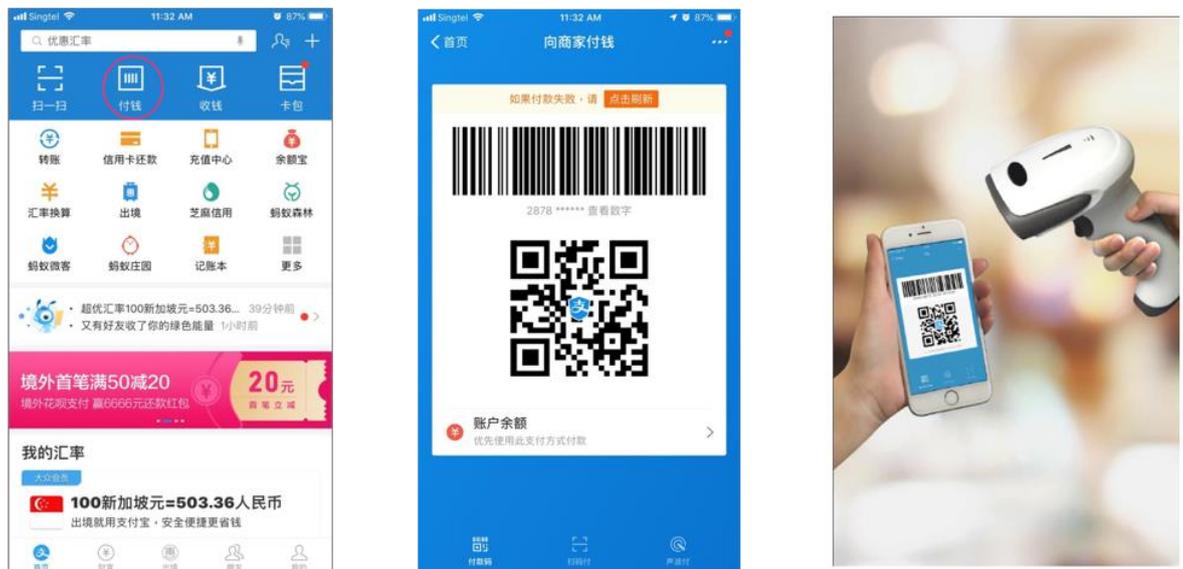


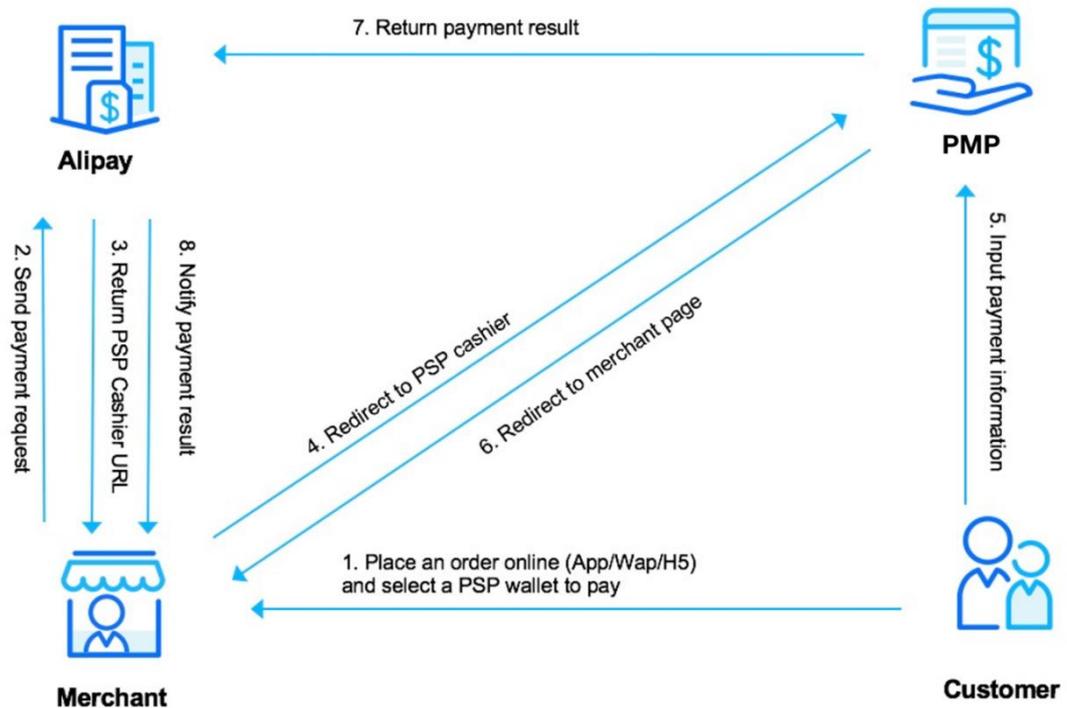Figure 3. Alipay display and QR-code for tickets (Alipay docs 2020).

Figure 4. Cashier Payment workflow (Alipay docs 2020).

## 4.4 WeChat Pay

WeChat is a messenger app that has over 1 billion users. It is owned by Tencent. WeChat is the most popular ways people in China communicate, even preferring it over email when doing business. It has a strong position in China, because other big messengers such as Facebook are blocked there. While WeChat's primary use is messaging, other functions have been integrated into the app, such as WeChat Pay, a payment feature. (Kharpal 2019)

The integrated payment solution can be used to make payments and transfer money to friends without difficulty. It can be used to pay for utility bills, groceries, tickets, and for shopping online. The app user can top up their e-wallet with their bank balance or vice versa transfer money to their bank account. The app runs in Chinese, English, and other international languages. (Floris 2020)

In order to use WeChat Pay, you need a Chinese bank account. It can then be linked with the app. Places you can use to pay with WeChat Pay are versatile, ranging

from big supermarkets to small street vendors nearly everywhere in China. There are two ways to pay for something with the app. Either the store can scan the users unique WeChat barcode, or the user can scan the merchant's barcode. There is also the option to pay online purchases with WeChat. To authorize the transaction however, you need to put in a passcode or have a biometric authentication system. WeChat also has the function for instant money transfers between contacts through the messaging function, which can be used for splitting bills and moving money around. (Kharpal 2019)

Compared to Alipay, it is a lifestyle app first, payment method second (Kuzima 2018).

WeChat supports 9 currencies. Cross-border transactions are not yet a simple procedure, but WeChat has made a partnership with Adyen, a company specializing in international payment technology, to aid foreign companies to access China. Figure 5. presents the option menu of WeChat pay. (Daxue Consulting 2020b)
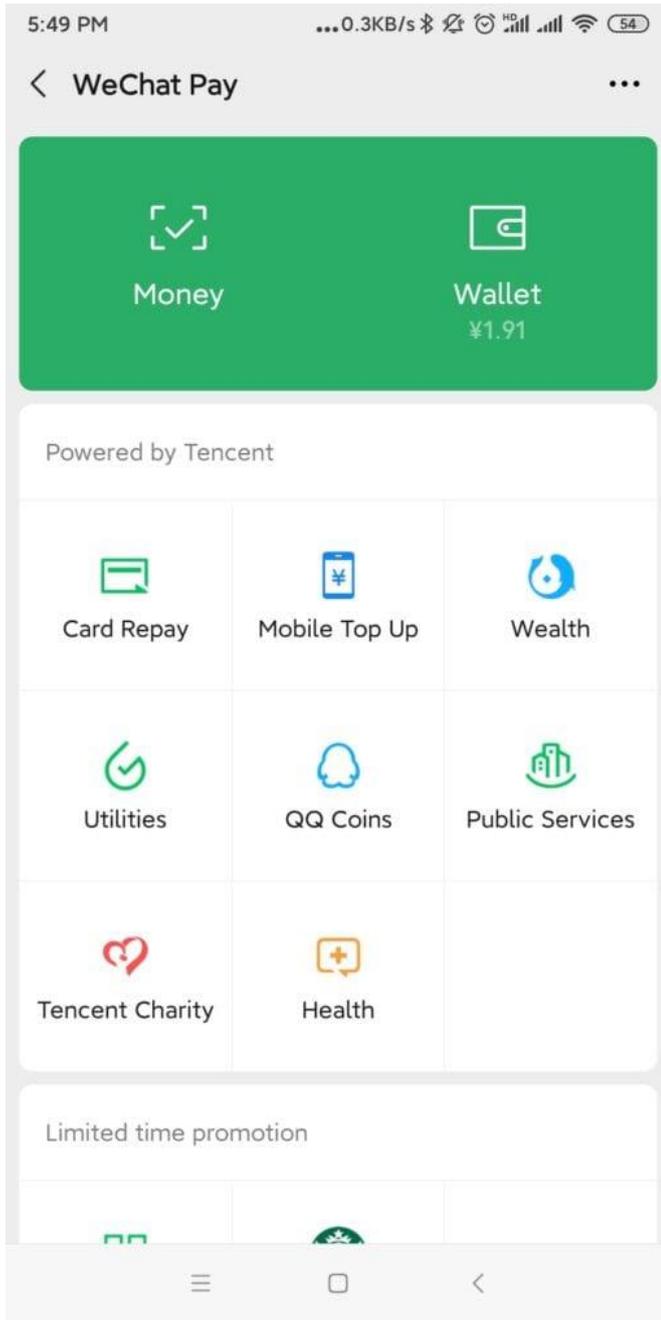
Figure 5. WeChat Pay display (Floris 2020).

## 5 PROSPECTS

Due to the convenience and ever evolving nature of online and mobile services, it is difficult to say which features will stay and if some completely new payment method will enter the market.

Figure 6. shows the vast number of users of different mobile payment providers. The Chinese mobile payment apps have a considerable amount more users compared to any of the western apps. In Figure 7. countries have been listed based on the adoption rate of mobile payment among the smartphone users. China is leading the process, and the gap between the next country with the highest rate should be highlighted.

| COMPANY | ACTIVE USERS | LATEST FIGURES FROM |
|---|---|---|
| Alipay | 1.2 billion+ | Alipay (Q3 2019) |
| WeChat | 1.151 billion | Tencent (Q3 2019) |
| Apple Pay | 441 million | Loup Ventures (Q3 2019) |
| PayPal | 305 million | PayPal (Q4 2019) |
| Samsung Pay | 51 million | Juniper (2018) |
| Amazon Pay | 50 million | Evercore ISI, Investopedia (May 2018) |
| Google Pay | 39 million | Juniper (2018) |

Figure 6. Table of statistics (Merchant Savvy 2020).

| Country | % of smartphone users | |
|---|---|---|
| China | 81.1% | Widepsread Adoption |
| Denmark | 40.9% | Very High Adoption |
| India | 37.6% | |
| South Korea | 36.7% | |
| Sweden | 36.2% | |
| US | 29.0% | High Adoption |
| Canada | 26.0% | |
| Norway | 25.8% | |
| Japan | 25.3% | |
| Switzerland | 22.3% | |
| Italy | 21.1% | Moderate Adoption |
| Indonesia | 19.8% | |
| Netherlands | 19.7% | |
| UK | 19.1% | |
| Australia | 18.8% | |
| Finland | 17.9% | Slow Adoption |
| Russia | 17.2% | |
| Spain | 16.5% | |
| France | 15.6% | |
| Argentina | 14.5% | |
| Brazil | 14.5% | |
| Germany | 12.5% | Very Low Adoption |
| Mexico | 10.2% | |

Figure 7. Mobile Payment Adoption by Country 2019 (Merchant Savvy 2020).

## 5.1 Accommodating to Chinese tourists

A survey conducted by Nielsen and Alipay in 2018 revealed that 91% of Chinese tourists would shop more while travelling if the foreign merchants had mobile payment options. Many countries have picked up on this. In 2018, according to Alipay's statistics, the number of mobile payment transactions increased 75 times in Russia and 12 times in Canada. The increase in numbers has also been observed in New Zealand, Australia, and Finland. (Daxue Consulting 2020b)

Chinese tourists are an alluring target group for tourist attraction merchants around the world. In the Finland's case, the Helsinki-Vantaa airport was among the first airports to allow Alipay as an official form of payment at the end of 2016. (Tanninen 2017, 31)

## 5.2 Confirmation through facial recognition

Facial-recognition payment has gained popularity in China. With facial recognition one does not necessarily even need a mobile device with them to accept payment, just one's face. (Liu 2020)

All customers must do now is to provide a photo of their face to a digital payment system or bank account, then pose in front of a POS machine equipped with a camera when making a purchase, the process shown in Figure 8. (The Guardian 2019)

*The user flows for first-time users and returning users of the FRP technology.*
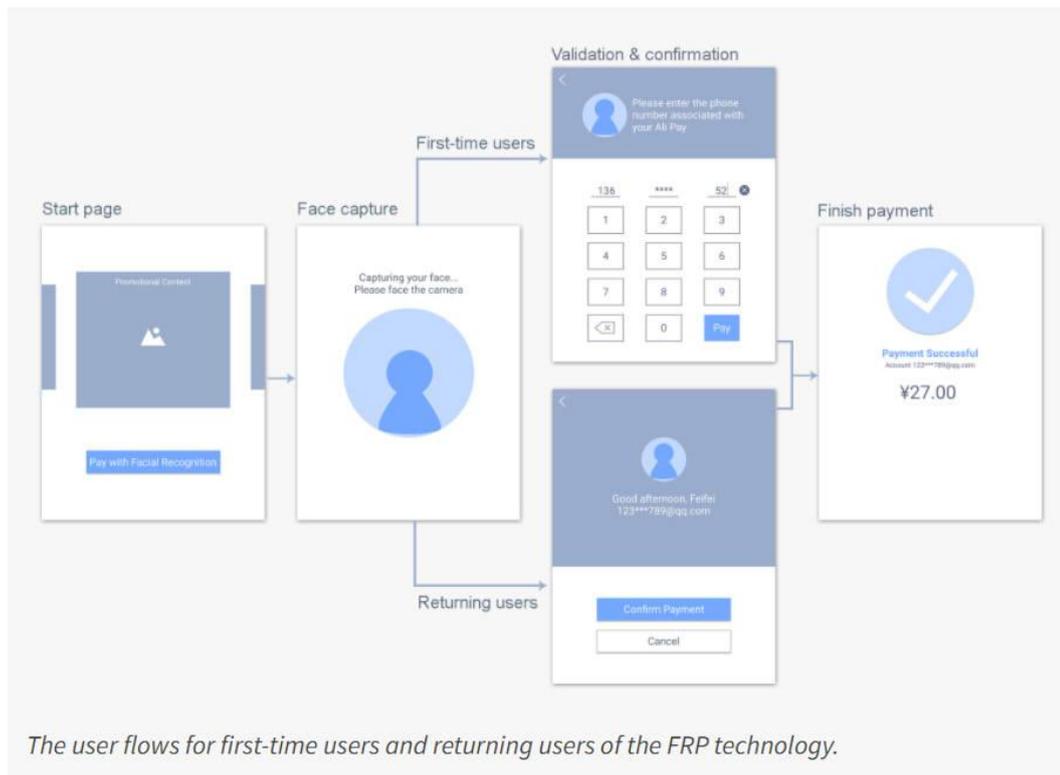
Figure 8. The facial recognition payment process (Liu 2020).

The software for facial recognition was already widely used in China, mostly to monitor citizens. There is concern that the state could use the collected facial recognition data for their own purposes, namely surveillance, tracking political dissidents, information control and profiling. Despite this, many consumers do not seem too concerned using FRP and about the possible privacy issues. There is another angle in which facial recognition is more secure than traditional ways of payment. That is that there is no need to use passwords, eliminating the risk that someone will see and steal it. Consumers seem more concerned on how they look while being scanned. In a poll made by news portal Sina Technology over 60% of the responders replied that their faces being scanned made them feel "ugly". (The Guardian 2019)

Leading the charge in bringing facial recognition payment is Alipay and their "Smile-to-Pay" system, with devices in 100 cities in 2019. The company intends to spend three billion yuan ($420m) on implementing the technology over three years. WeChat responded by developing a facial payment machine of their own called "Frog Pro". At Tianjin, a IFuree self-service supermarket has a 3D camera scanning the faces of those who enter the store and again at the check-out. The camera

measures the width, height, and depth of the face. Consumers using facial recognition as form of payment find the method convenient and efficient at the check-out. Still, the numbers in using the new technology are relatively modest. Figure 9. shows the comparison between the payment methods, highlighting the device requirements and the amount of time it takes for the transaction to happen. (The Guardian 2019)

| Payment Methods | Device Requirements | Software Requirements | Time Cost |
|---|---|---|---|
| Apple Pay or Android Pay | A phone that supports facial recognition | Credit/debit card preset in Apple Pay | Within 15s |
| QR-code scanning | A smartphone with a camera | An Ali Pay/WeChat account and an associated bank account | 30s – 1min |
| Facial recognition | None (well, a face) | An Ali Pay/WeChat account and an associated bank account | 10 – 15s (For frequent users, it could be less than 10 seconds) |

Figure 9. Comparing mobile payment and facial recognition payment (Liu 2020).

# 6 ANALYSIS

The objective of this thesis was to make an overview of the current situation and the future development of mobile payment. The goal was also to find out some of the factors that affect mobile payment becoming popular and if China is already moving on to a new payment method.

Mobile Pay seems to have gained some traction in Finland, but mobile payment itself has not gained mainstream status. Mobile payment seems an obscure curiosity and a less known alternative option for the mainstream card payments. Many sources predict that the breakthrough of mobile payment is approaching, though it is unclear when this will happen and in what form.

China on the other hand has already built a functioning ecosystem for their mobile payment devices and software. The method with QR-codes has been made to be widely applicable. It remains to be seen how they will be incorporating new payment methods on their existing system in the future. In regarding facial recognition payment, businesses could have separate face scanners or utilize scanners on mobile phones.

## 6.1 Old habits of consumers

Card based systems are well established in Finland. Using a card is relatively effortless; the service providers have made their use widely available, and consumers trust the system. There has not been significant push to move on from the card system, only slight pull in the form of convenience that real-time transactions bring. To change the status quo, the new option should bring significant benefits compared to the old system. It could be said that a 'do not fix what is not broken' mentality is prevalent regarding the payment methods in Finland.

It is highlighted that consumers used to the old working system need a strong reason to start using new systems. However, the COVID-19 pandemic and the increased concerns with sanitary transactions, has been seen to be a strong reason for more people to start using mobile payments.

## 6.2 Changes to systems

Currently the cash register systems in Finland are mainly supporting card reading. By skipping the card payment phase, China also skipped the heavy use of the card reader technology. The vendors can choose to invest in hardware that supports the use of scanning the customers' QR-codes or just use a printed QR-code for the customer to scan. In this regard Chinas' Alipay and WeChat Pay are very versatile and the threshold for their use is incredibly low. Much of the needed systems are contained within a smartphone, namely the app and the scanner.

In Finland, mobile payment reading should somehow be integrated with the existing card reader hardware and software. Or when time passes, maybe mobile payments could be highlighted with a system of their own to differentiate it from card payment. But before that, providers should build a vaster ecosystem for mobile payment usage.

## 6.3 China

China is a unique market environment for online services. Its' internet is isolated from the rest of the worlds' internet. Many global services such as Google and other apps are banned in China. That means the domestic services do not have to compete with foreign ones. Chinas' vast population covers the required users for the services.

For China, there was no phase to convert from a card system to mobile pay. Mobile payment was made widely accessible for both the consumers and the merchants. Upkeeping a system working with QR-codes is relatively simple and inexpensive. Therefore China did not stagnate to using bank and credit cards.

There could be the possibility that Finland could catch up in mobile payment if China indeed is moving more towards FRP. Current QR-code scanning based mobile payment is accessible to a wide array of retailers, since all you need is to have at the POS is a printed QR-code. For FRP however, the retailer needs to install the scan-

ning equipment. Not all merchants can afford this. It is yet to be seen how wide-spread FRP could be and if and how the Chinese companies could make it more accessible.

## 6.4 Validity and reliability

Most sources used in the thesis are articles that offer a experts view of the situation. Scientific information and research presented in these sources boils down to statistics. Also, like mentioned, the state of payment methods is ever evolving, so some of the information presented in the thesis may become outdated quickly. For example, the state of the service providers may change during the writing of the thesis. The thesis can however lay some groundwork information that can be built upon by further studies.

One thing to remember when considering information about China is the Chinese censorship. Sources vary with ones made by experts on the outside looking in and sources published within the Chinese system by the Chinese officials. The information outside the Chinese system is from the viewpoint of experts familiar with the Chinese market. The information within the system meets the terms that are required by the Chinese government. It is unclear how much of the information is accessible from outside the Chinese internet. Also, these sources are more often written in Chinese, so there is a language barrier.

## 6.5 Conclusions

Finland's and China's market environments are vastly different. It is not possible to make straight comparisons due to the difference in market size, population size and the regulations that apply to each market. Finland is very small compared to China and has a different market environment compared to China. China has a more isolated market that serves its' domestic production, while Finland has to abide with the international competition and regulations as well.

Everything leads up to what is the most convenient for the consumers. For Finland, a system based on bank cards works simply fine, so there is little need for changes in the status quo. The card-based system is clear for both customers and service providers compared to the yet obscure selection and application of mobile payment. The COVID pandemic has steered people to take notice of mobile payment, but any significant breakthrough has yet to be seen. For China on the other hand, mobile payments evolved to be the more convenient option, with uniting payment method, online shops, and messaging platform into the same circle. And at the same time, they managed to do it inexpensively for the users, guaranteeing its' wide use among vendors of all sizes.

## 6.6   Further research

As mobile payment becomes more developed in Finland, more studies can be made in how the service is regarded by the consumers. This information can then be used on how to further improve mobile payments' applicability and status on the Finnish market. More statistical information could be useful to produce as well as ways for service development.

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