

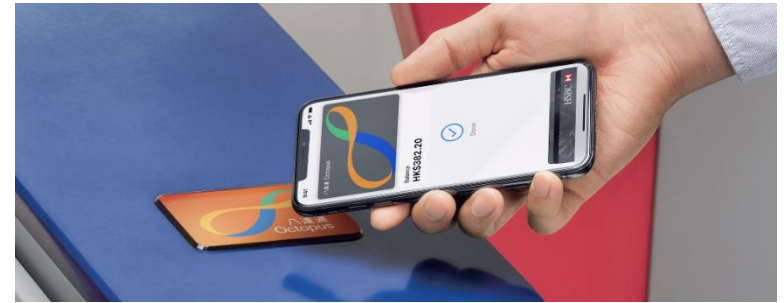
The Mobile Payment



What is it?

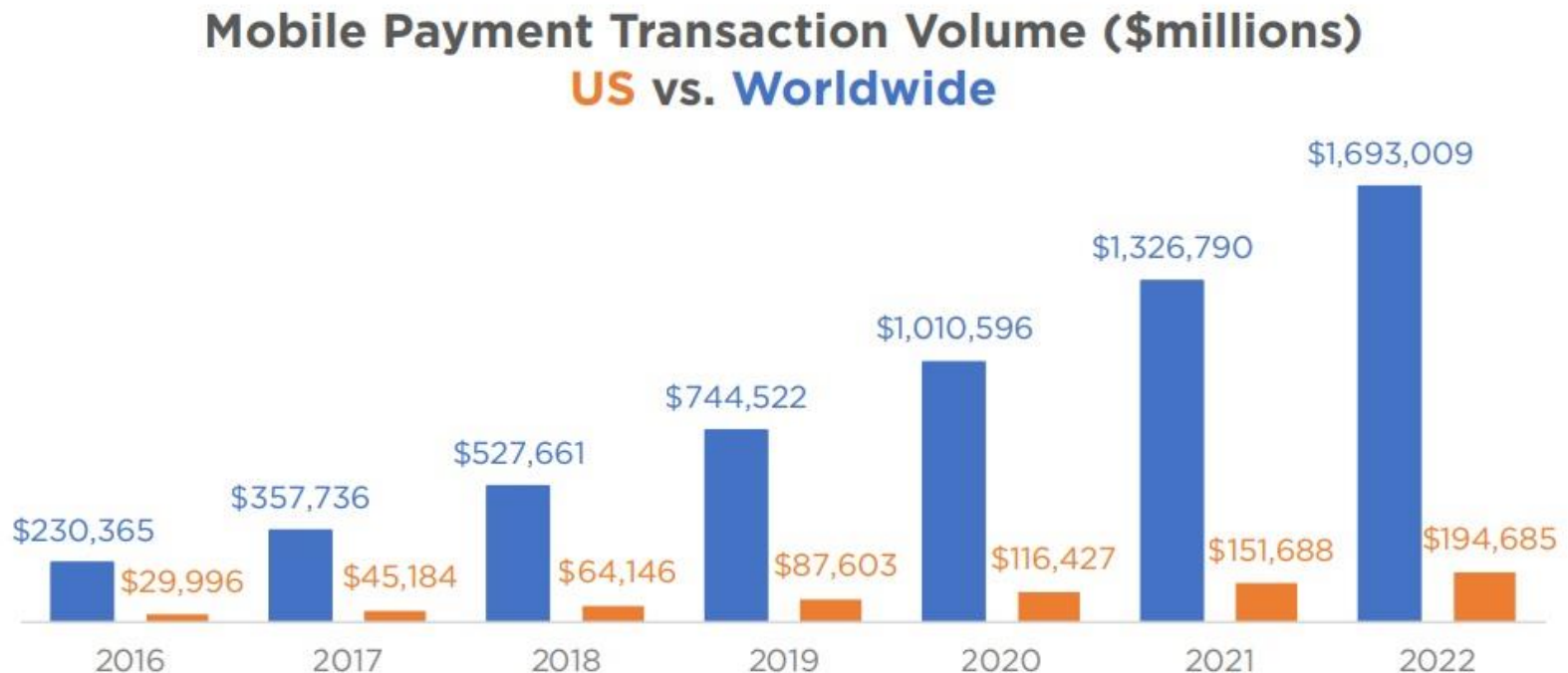
OUTLINE

- Overview of Mobile Payment
 - Advantages of mobile payment
- Forms of Mobile Payment
 - Case study on Apple Pay
- Security Issues of Mobile Payment



Mobile Payment Status

Data from Juniper Research indicates that there will be 450 million OEM Pay wallet users worldwide by 2020. This figure includes but is not limited to Apple Pay, Google Pay, and Samsung Pay), spending over \$300 billion using their mobile devices – according to [The State of Mobile Payments in 2019](#). (The world population is 7.8 billion in 2020)



Mobile Payment in Hong Kong

Hong Kong Internet Registration Corporation Limited (HKIRC) commissioned the Internet Society Hong Kong to conduct the online survey in late July 2019, which successfully collected 1,200 responses from local residents. Most of the respondents ranged in age from 18 to 65 and worked in a variety of industry sectors.

Usage on Mobile Payment

Mobile Payment is the Trend Now



74%

of the respondents believe mobile payment is the trend now

Mobile Payment Can Replace Cash/Credit Cards



50%

of the respondents indicate that mobile payment can replace cash / credit cards



84%

of the respondents have used mobile payment before



93%

of the respondents of age 18-25 have used mobile payment before



77%

of the respondents of age 56-65 have used mobile payment before

According to the survey findings, there is no direct correlation between income, education, and occupation on the mobile payment usage.

Top 3 Payment Methods



Credit Card

37%



Octopus Card

25%



Mobile Payment

23%

Mobile Payment in Hong Kong

Around 80% of survey respondents used **mobile payments** at least once per week (once per week: 17%, 2–3 times per week: 28%, 4–5 times per week: 16%, every day: 19%), and 88% of such **payments** were for transactions of less than HK\$500. (Aug 2018)

Participation in Mobile Payment

Top 3 Places Where Mobile Payment is Used



Retail /
Physical Store



Online Shopping



Dining

Top 3 Areas Where Respondents Wish to Use Mobile Payment in the Future



Public Transport



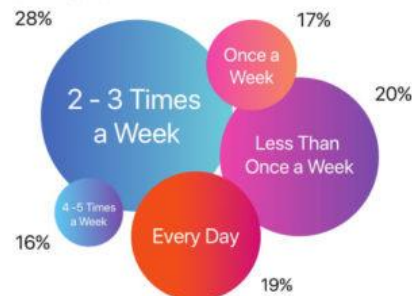
Government Bill



Clinic

Mobile Payment Usage Frequency

(in weekly expenses)



Money Spent on Mobile Payment

88%

<\$500



8%

\$500-\$1000



Banks and Mobile Banking Users

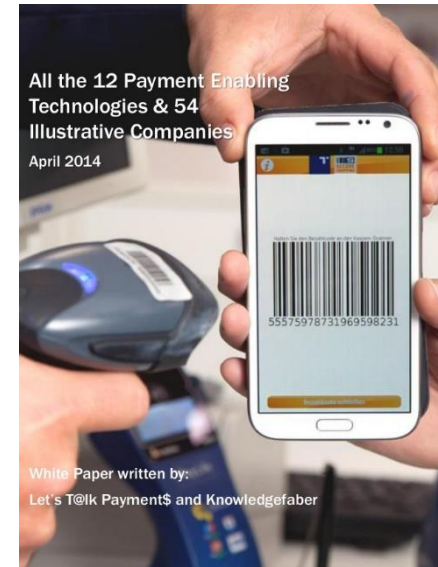
Overall Statistic

- 79% of smartphone owners have used their device for an online purchase in the past six months.
- More than three-quarters of Americans used a mobile device to check their bank balance in 2019.
- The total value of payments made using mobile devices will have reached \$503 billion in 2020.
- By 2021, there will be roughly 7 billion mobile users worldwide.
- 6.93% of millennials (1980- 2000) used mobile banking in 2019.
- Bank of America continues to an industry leader with 25 million mobile active users.
- Mobile app fraud transactions have increased by over 600% since 2015.



What is mobile payment?

1. A mobile payment is a **money payment** made for a product or service through a **portable electronic device** such as a tablet or cell phone.
2. Mobile payment technology can also be used to send money to friends or family members, such as with the applications PayPal, WesternUnion.
3. Examples of mobile apps: Alipay, Octopus, PayMe, WeChat.
4. Examples of Banks and Credits Cards: VISA, Master Card, HSBC, Union Pay



What is Mobile Payment?



1. Location of payer

- Mobile
- On the move
- Point of Sales (POS)



2. Support infrastructure to process payment

- Credit card
- Prepaid wallet
 - ❖ Same as a standard one but is simply an e-wallet with prepaid cards loaded.
 - ❖ They do not linked to an external account.
 - ❖ More secure than credit card
 - ❖ Gift cards, e.g. apple store, google store



Why uses mobile payment?

Advantages for Consumers

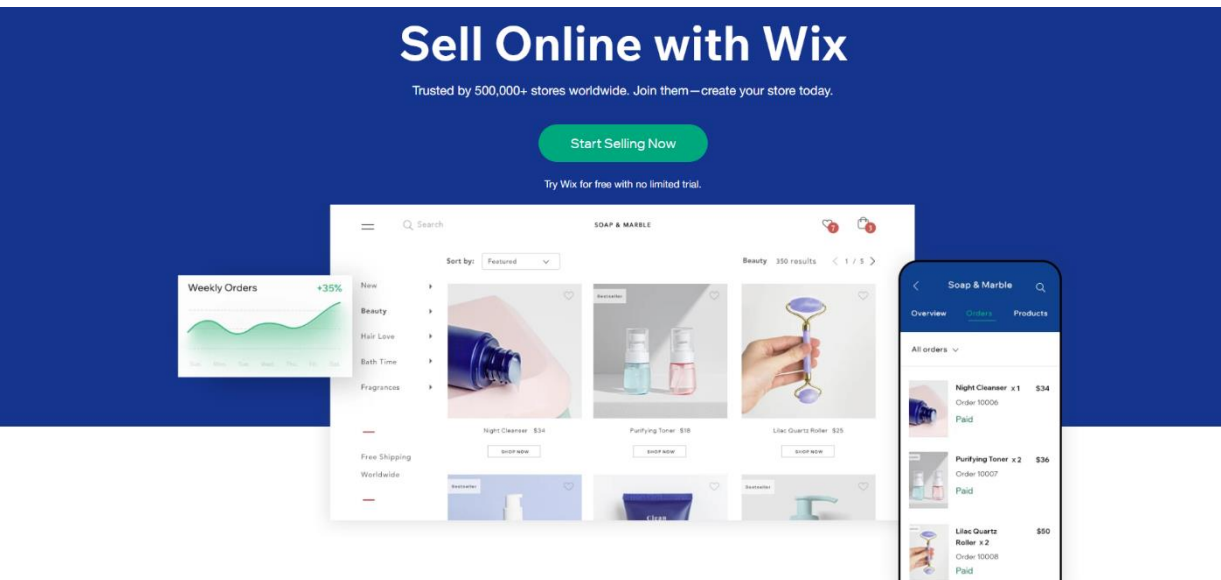
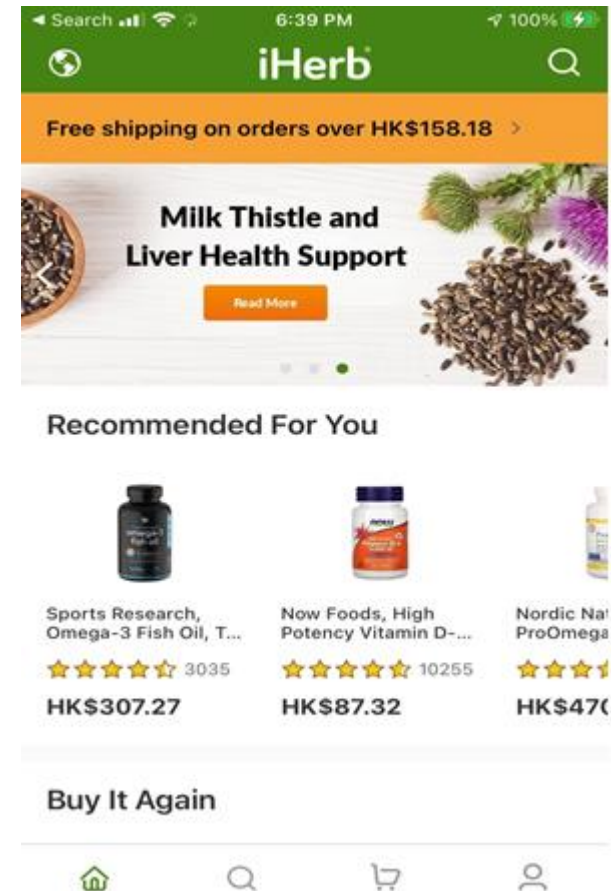


1. Secure
 - No need to carry cash
 - No risk to be lost or stolen
 - Safe with biometric authentication such as Apple Touch ID (1:50,000), Apple Face ID (1:1,000,000); fast
2. Easier payment process
 - No need to counting cash coins
 - Single click or by facial recognition
3. Cool way to pay
4. Better tracking of their spending, reduce paper waste, and decrease costs for businesses
5. Contactless payments → COVID-19

Why uses mobile payment?

Advantages for Shop Owners

1. More returning customer
 - E.g iHerb for healthy products
2. Easy and cheap setup
3. Increase conversion rate



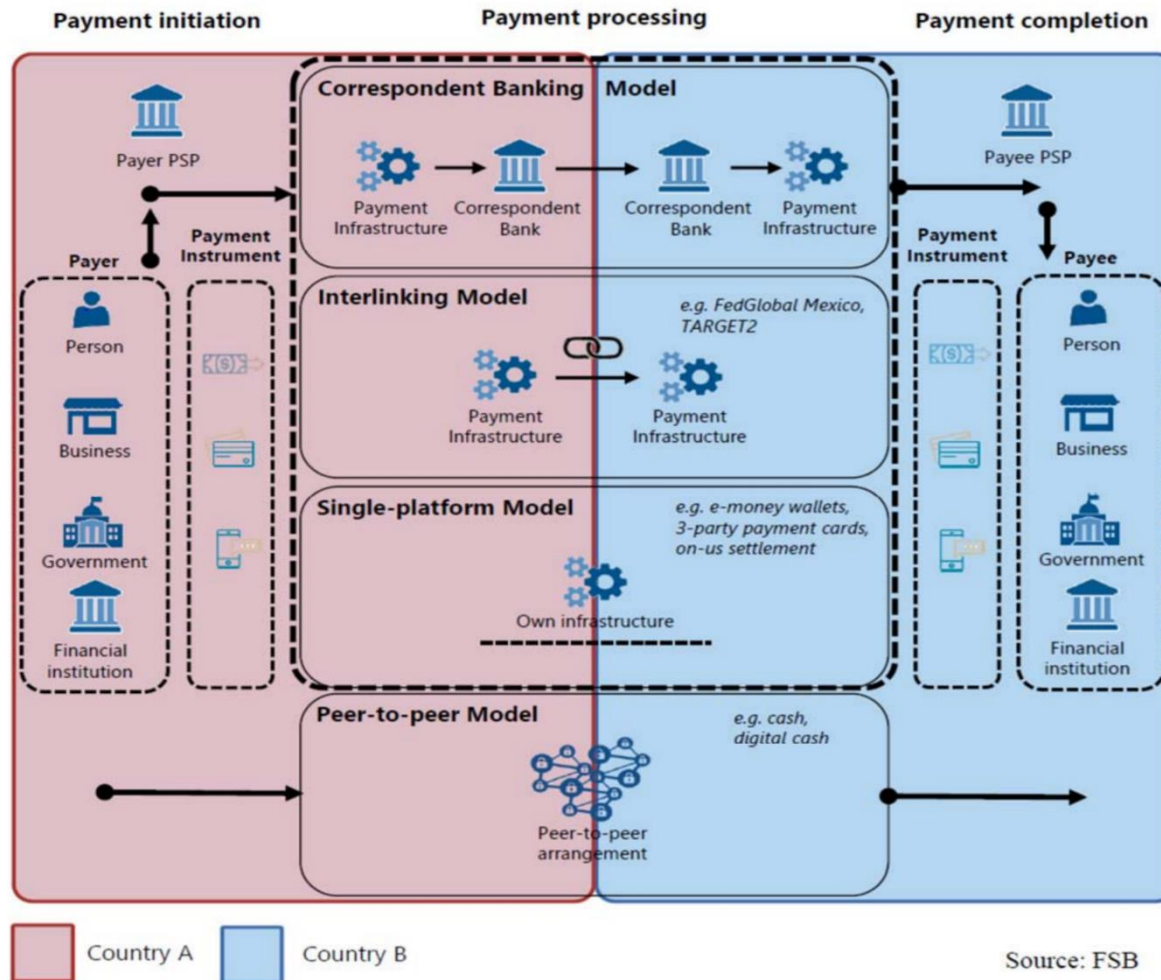
How digital wallets increase mobile conversion rate?

Over 63% of all web traffic comes from a tablet or phone - and yet only 40% of all ecommerce transactions are completed on mobile devices.

- *37% abandoned because the website wanted them to create an account*
- *28% left because the checkout was too long/complicated*
- *19% just didn't trust the site with their credit card information*
- *8% said they were frustrated there weren't enough payment methods*

➔ Mobile wallets such as Apple Pay, Alipay, and Google Pay hold a consumers preferred credit card, billing information and shipping address behind several layers of encryption, and allow a customer to execute a “1-Click Checkout”.

Various Models Supporting Cross-border Payment Market



Different Forms of Mobile Payment

1. SMS Payment

- mainly in developing market
- Attractive for micro payments



In the Netherlands, you can generate QR codes on receipts so customers can pay without queuing.



2. QR Code Payment

- Alipay, WeChat

3. NFC Payment

- Apply Pay, Andriod Pay

4. Payments with Apps or Mobile Websites

- iTune Store, Google Store



In China, it's common to pay with QR codes, mostly through Alipay or WeChat.

5. Virtual Prepaid Cards

- same functions of a physical prepaid card except that you can only use them for online purchases and for phone orders.

6. Mobile Credit Cards Readers

- It is a dongle that is attached to a smartphone or tablet that allows the device to read and process debit and credit card payments.

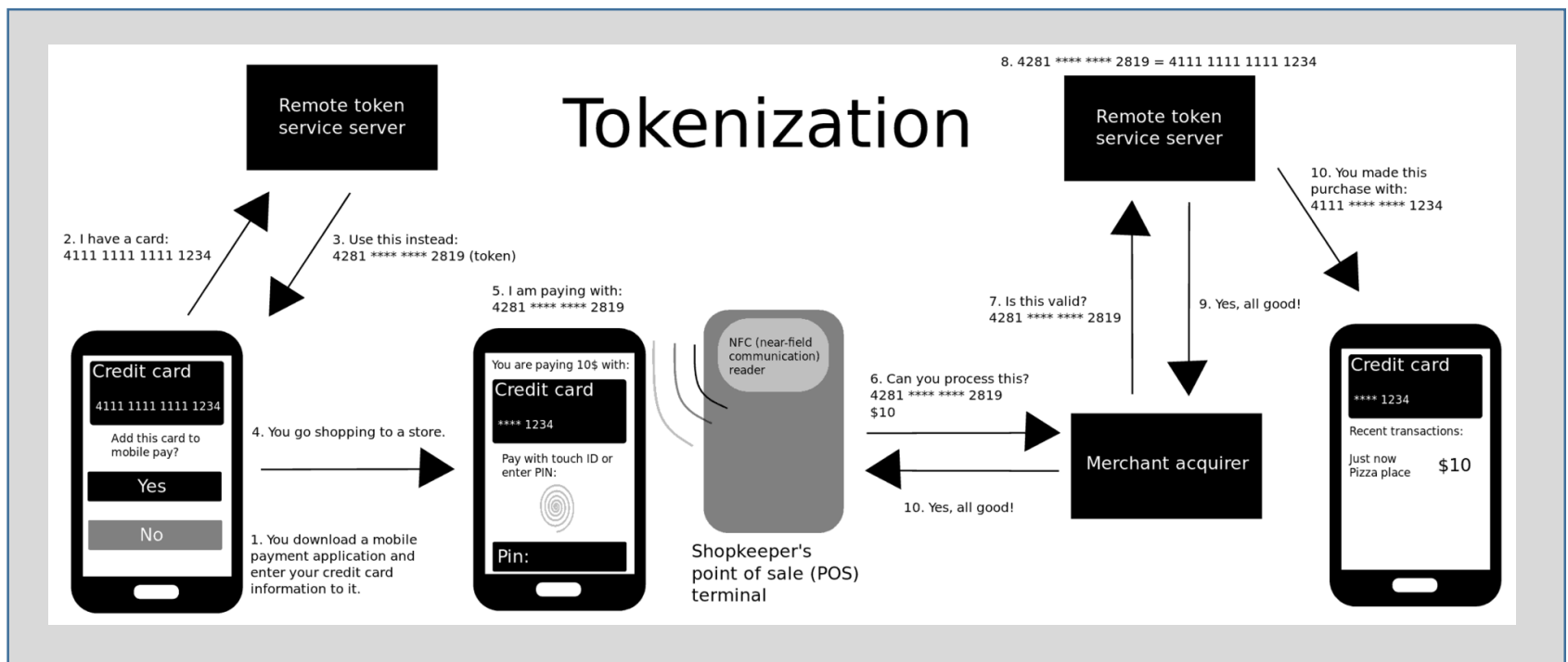
Case Study - Apple Pay



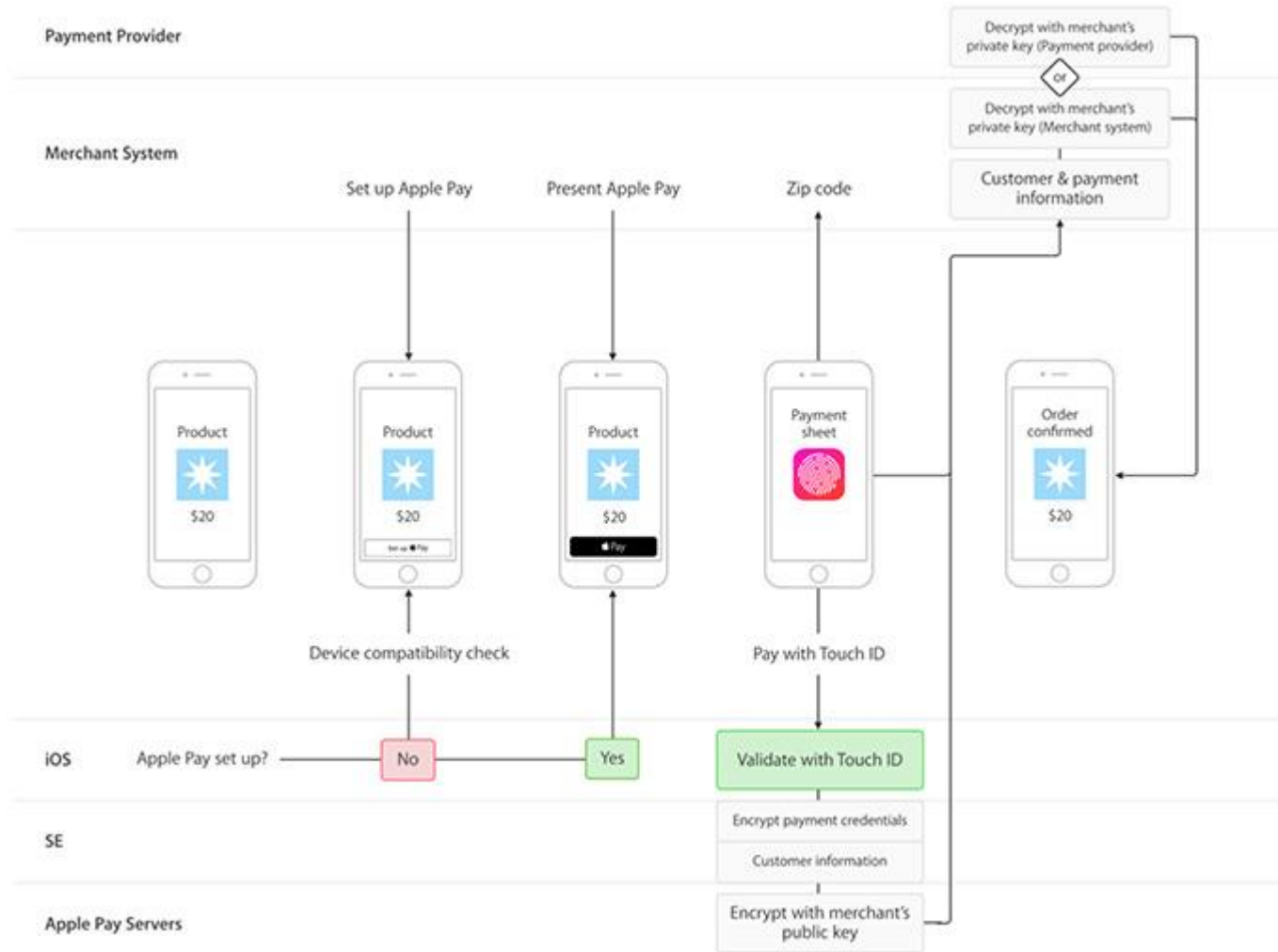
- According to the 2018 Hong Kong Retail Banking Satisfaction Study by JD Power, between November 2017 – January 2018, about 29% of residents saying it was their main mobile wallet.
- It uses near-field communications (NFC) technology built into iPhones and Apple Watch devices
- Face ID or Touch ID for Security
- “Tokenization.”
- According to an Apple spokesman, Apple Pay accounts for nearly 90% of all NFC transactions globally.

Security in Mobile Payment -Tokenization

- It is the process of substituting a sensitive data element with a non-sensitive equivalent, referred to as a token, that has no extrinsic or exploitable meaning or value.
- Tokenization may be used to safeguard sensitive data involving, for example, bank accounts, financial statements, medical records, criminal records, driver's licenses, loan applications, stock trades, voter registrations, and other types of personally identifiable information (PII). Tokenization is often used in credit card processing.



Payment Flow of Apple Pay



Source: developer.apple.com

Security in Mobile Payment

- **Mobile app** fraud transactions have increased by over 600% since 2015.
- About one in every 20 fraud attacks are associated with a rogue mobile app.
 - Rogue mobile apps are counterfeit apps designed to duplicate those of trusted brands.
 - On average, there are 82 new rogue applications submitted per day.
- Mobile fraud losses totaled more than \$40 million across 14,392 breaches in 2019.



DataProt: <https://dataprot.net/statistics/mobile-banking-statistics>

Hong Kong's e-commerce market trends:

Compact city-state slow to adopt e-commerce

HONG KONG: At a glance

Population ⁴	7.5 million
Average age ⁵	44.4 years
Gross domestic product ⁶	\$341.4 billion
E-commerce market value ⁷	\$3.7 billion
Mobile commerce market size ⁸	\$1.4 billion
Mobile commerce as a percentage of e-commerce market size ⁹	36%
Internet penetration ¹⁰	89.4%
Smartphone penetration ¹¹	75%
Bank account penetration ¹²	95.3%
Card penetration per capita ¹³	3.48

- The potential of Hong Kong's e-commerce market is reinforced by the fact that most of the population is yet even to use e-commerce, but this suggests both a challenge and an opportunity for merchants.
- Its online shopping market is projected to expand at a compound annual growth rate of 10.2 percent to 2021.
- [The Hong Kong Institute of Bankers: Security](#) is one key issue to customer retention → over 80% of customers have not tried or do not intend to try mobile banking.
→ mobile security is a critical issue

Smart Phone Security Threats



<https://www.le-vpn.com/security-challenges-on-mobile-devices/>

Tips to enhance Mobile Security and Privacy

- Always password-protect your phone
- Only download safe apps
- Always read the terms and privacy policy
- Turn off Bluetooth
- Encrypt your phone
- Set up remote locate/wipe

- Back up your data
- Don't jailbreak or root your phone
- Update the operating system
- Download anti-malware
- Use public WiFi with caution
- Use a VPN

Potential vulnerabilities affecting the Security in Mobile Payment System

