

World Bank Fast Payments Toolkit

Case Study: Hong Kong SAR, China

FPS | 2018

Payment Instruments



Credit
Transfer



Direct Debit



E-money

Use Cases/ Services



Merchant
Payment



Bulk/Batch
Payment



Bill
Payment



Request to
pay



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Glossary of terms

S. No.	Term	Definition
1	GDP	Gross Domestic Product at current price
2	Income Category	Classification as per World Bank based on Gross National Income (GNI) per capita
3	CPMI	Committee on Payments and Market Infrastructure
4	FPS	As per CPMI, fast payment System is defined as payments in which the transmission of the payment message and the availability of final funds to the payee occur in real time or near-real time and on as near to a 24-hour and 7-day (24/7) basis as possible
5	Oversight	Regulating or governing body supervising the payments system
6	Operator	Institutions responsible for the operation of the payment system
7	Alias	Alternative to bank account numbers for increased convenience of the customer. For e.g., mobile number, national identification number
8	Access Channels	Modes used by customer to initiate transaction on FPS. For e.g., branch, internet, mobile
9	Individual Payment Type	Person to person (P2P) – Payment between individuals for non-business purposes
10	Business Payment Type	Person to Business (P2B) – Payment from an individual to a business entity Business to Person (B2P) – Payment from a business entity to an individual Business to Business (B2B) – Payment between two business entities
11	Government Payment Type	Person/Business to Government (P/B2G) – Payment from person/Business to a government institution Government to Person/Business (G2P/B) – Payment from government institution to a person or business entity
12	Credit transfers	Credit transfers are payment instruments based on payment orders or possibly sequences of payment orders made for the purpose of placing funds at the disposal of the payee
13	Direct Debits	Direct debits are payment instruments in which the transaction is pre-authorized, and funds are blocked in account for a debit to be initiated at a future date. In direct debits, payer's account is debited on execution of mandate by merchant or payee
14	E-Money	E-money is a prepaid value stored electronically, which represents a liability of the e-money issuer (a bank, an e-money institution or any other entity authorized or allowed to issue e-money in the local jurisdiction), and which is denominated in a currency backed by an authority

Abbreviations

S.No.	Term	Expanded form
1	BOCHK	Bank of China (Hong Kong)
2	CFI	Cybersecurity Fortification Initiative
3	CHATS	Clearing House Automated Transfer System
4	FIDD	Financial Infrastructure Development Division
5	HKAB	Hong Kong Association of Banks
6	HKD	Hong Kong Dollar
7	HKID	Hong Kong Identity
8	HKICL	Hong Kong Interbank Clearing Limited
9	HKMA	Hong Kong Monetary Authority
10	PSSVFO	Payment Systems and Stored Value Facilities Ordinance
11	SVF	Stored Value Facility

Select parameters



GDP
USD 366 billion



Income Category
High



Population
7.5 million



Access to mobile phone*
92.02%



Access to internet*
81.30%



Bank account*
95.30%



Branches per 100,000 adult
21



Made or received digital payment in last 1 year*
84.50%



Received government wages or transfer in account*
57.20%

Source : World Bank – 2019, Income Category: World Bank – June 2019
Currency Exchange Rate USD 1 = HKD 7.8 <2018 Average, World Bank>
Others – World Bank 2017

* For age >15 years

How to read this report

- This **draft deep dive report** relates to the **Faster Payment System** in **Hong Kong SAR, China**
- It has been developed based on **primary interviews** with key stakeholders such as **regulators, operators** and **service providers** in the system as well as by leveraging **secondary sources**
- Key secondary sources include HKMA website, HKICL website and their publications
- The table below presents a legend to assist readers as they navigate through different sections of the report

Legend



The first slide of every section includes a chapter summary to provide readers with an overview of the section contents



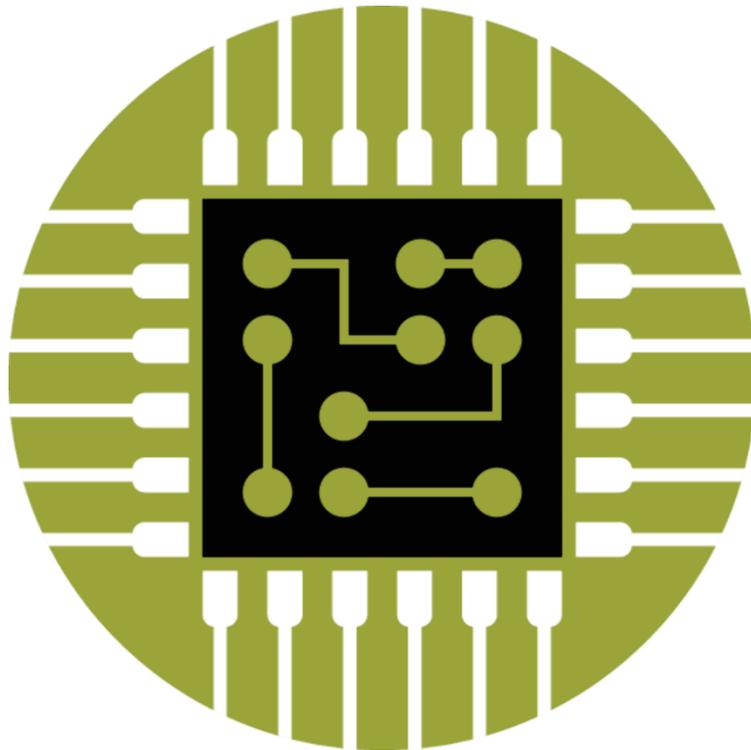
The green box with the adjacent icon indicates **section/sub-section summary across** the report. Reader may choose to read through this for a **high-level overview on the selected topic**

Table of Contents

		Slide number
A.	Executive Summary	8
B.	Detailed Report	
1	Overview	
1.1.	Background and Objectives	11
1.2.	System Development and Key Timelines	12
2	Business and Operating Model	
2.1.	FPS Structure	14
2.2.	Participants	15-16
2.3.	Payment Instruments, Transaction Types and Channels	17
2.4.	Aliases	18
2.5.	Use Cases	19
3	User Adoption	20
4	Technical Details and Payment Process	
4.1.	Technical Details (Messaging Format, QR Codes, APIs, Customer Authentication and Tokenisation)	22-23
4.2.	Payment Process (Customer Registration, Transaction Fulfilment, Liquidity Management and Settlement)	24-28
5	Governance Framework	
5.1.	Legal and Regulatory Aspects	31
5.2.	Risk Management	32-34
5.3.	Customer Complaints	35-36
6	Annexure	
6.1.	Key Features	38
6.2.	HKMA Smart Banking Initiatives	39
6.3.	Direct Debit Transaction Process	40

A. Executive Summary

Faster Payment System | Hong Kong FPS



- Faster Payment System (FPS) is an instant payment system launched in September 2018 in Hong Kong. FPS enables their customers to make cross-bank/e-wallet payments easily, by entering the mobile phone number or, the email address, or the FPS Identifier of the recipient, with funds available to the recipient almost immediately
- FPS came about as a result of one of the **smart banking initiatives** announced by Hong Kong Monetary Authority (HKMA) in September 2017
- The system was developed jointly by HKMA & Hong Kong Interbank Clearing Limited (HKICL). **HKICL** was entrusted with the responsibility to **operate the system**
- FPS was developed as a new extension of the CHATS which was already a designated system under the Payment Systems and Stored Value Facilities Ordinance (PSSVFO)

- **Key features of FPS are**

- | | | |
|---------------------------------------|--------------------------------|-----------------------------|
| • Real time payments | • ISO 20022 messaging standard | • Real time settlement |
| • Simple addressing via three aliases | • Operates 24x7x365 | • Supports multi currencies |

- Users can make FPS payments via various channels like **internet or mobile banking platforms**. They can also initiate Request to pay via **QR codes**.
- Currently, the FPS supports **P2P transfers, merchant payments, bill payments** and enhanced capabilities such as **Direct Debit, Request to Pay and bulk/batch payments**

B. Detailed Report

1. Overview

Chapter sections:

- 1.1. Background and Objectives
- 1.2. System Development and Key Timelines



Chapter Summary:

- Prior to the launch of FPS, **interbank transfer in Hong Kong SAR, China** was done by Real Time Gross Settlement (RTGS) system also known as Hong Kong Dollar Clearing House Automated Transfer System (**CHATS**) which was introduced in 1996
- However, HKMA identified few drawbacks in the pre-existing payment ecosystem such as
 - There existed a multi-tier clearing system based on transaction value
 - Lack of interoperability between banks and SVFs
- Considering the above constraints, HKMA decided to introduce Faster Payment System in Hong Kong to **provide cost effective, safe, efficient and widely accessible channel for customers** to send and receive payments
- A sound and secure ecosystem for electronic payment systems with proper regulatory and legal backing was provided with amendment of the Payment Systems and Stored Value Facilities Ordinance (PSSVFO) in 2016 which brought Stored Value Facilities (e-wallets) in the payment ecosystem prompting innovation
- FPS in Hong Kong offered unique characteristics compared to other Faster Payment System in the world like dual currency acceptance (Hong Kong Dollar & Chinese Reminbi), settlement and operation split between two entities i.e., HKMA & HKICL and RTGS mode of settlement
- It was developed as a new extension of CHATS jointly by HKMA and HKICL

1.1. Background and Objectives



- With a view at driving innovation & usher the era of smart banking, **HKMA introduced few major initiatives** in the banking sector in 2017
- **One** of the identified **initiative** was **develop Faster Payment system** and drive innovation by bringing onboard e-wallets on the platform in addition to banks
- Broad objective for the fast payment platform was to introduce **smart banking & consolidate the position of Hong Kong's status as international financial center**

- HKMA has been proactive in seeking inputs from the banking sector and the payment industry to improve the payment system facilities in Hong Kong. To ensure wider usage of electronic payment and to drive innovations, it amended the **Payment Systems and Stored Value Facilities Ordinance (PSSVFO)** in 2016, which brought Stored Value Facilities(SVFs) to its fold
- Despite these developments, HKMA identified space for further enhancing payment efficiency in smaller-value payments as **smaller-value fund transfers across different banks would often take more than a day to complete.** There were only limited top-up channels from bank accounts to SVF e-wallets, while transfers between e-wallets were not possible. This reflected the underlying issue of the **lack of a common platform** open to all payment service providers
- Therefore, HKMA considered it important to conceptualize **development of a Faster Payment System (FPS) in Hong Kong for complete connectivity of digital retail payments among customers of banks and SVFs**

- With rapid technological advancement and its growing impact on the banking industry, the **HKMA announced in September 2017 several initiatives to prepare Hong Kong SAR, China to move into a new era of Smart Banking***
- FPS was launched as one of the initiative which aimed to provide full connectivity of digital retail payments



Objectives of the Faster Payment System



1.2. System Development and Key Timelines



The implementation of the HK FPS took approximately **a two and a half years to complete** post initiation by HKMA. The entire system was **developed in-house** by HKICL with external vendors only being employed in the testing phase

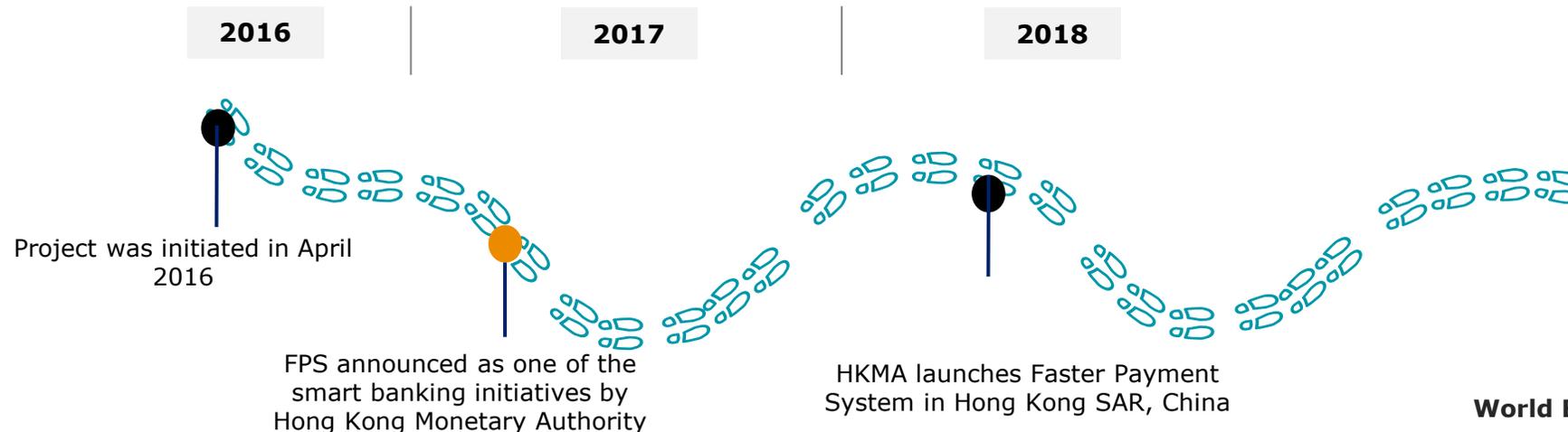
Development Process

- The FPS encompasses a basic infrastructure which supports real-time credit transfers and direct debit functions, and other overlay services enabling value added functions such as an addressing service and direct debit mandate creation
- The entire system was **developed in-house** jointly by HKICL & FIDD of HKMA and no external vendors were engaged. Services of external vendors were taken only during the testing phase of the development
- The HKICL is owned jointly by the HKMA and HKAB. It has extensive experience in developing and operating the critical FMIs including the RTGS (with which the FPS is closely linked)

Implementation Timelines



Key Milestones



2. Business and Operating Model

Chapter sections:

- 2.1. FPS Structure
- 2.2. Participants
- 2.3. Payment Instruments, Transaction Types & Channels
- 2.4. Aliases
- 2.5 Scheme Pricing and Fee Structure
- 2.6 Use Cases



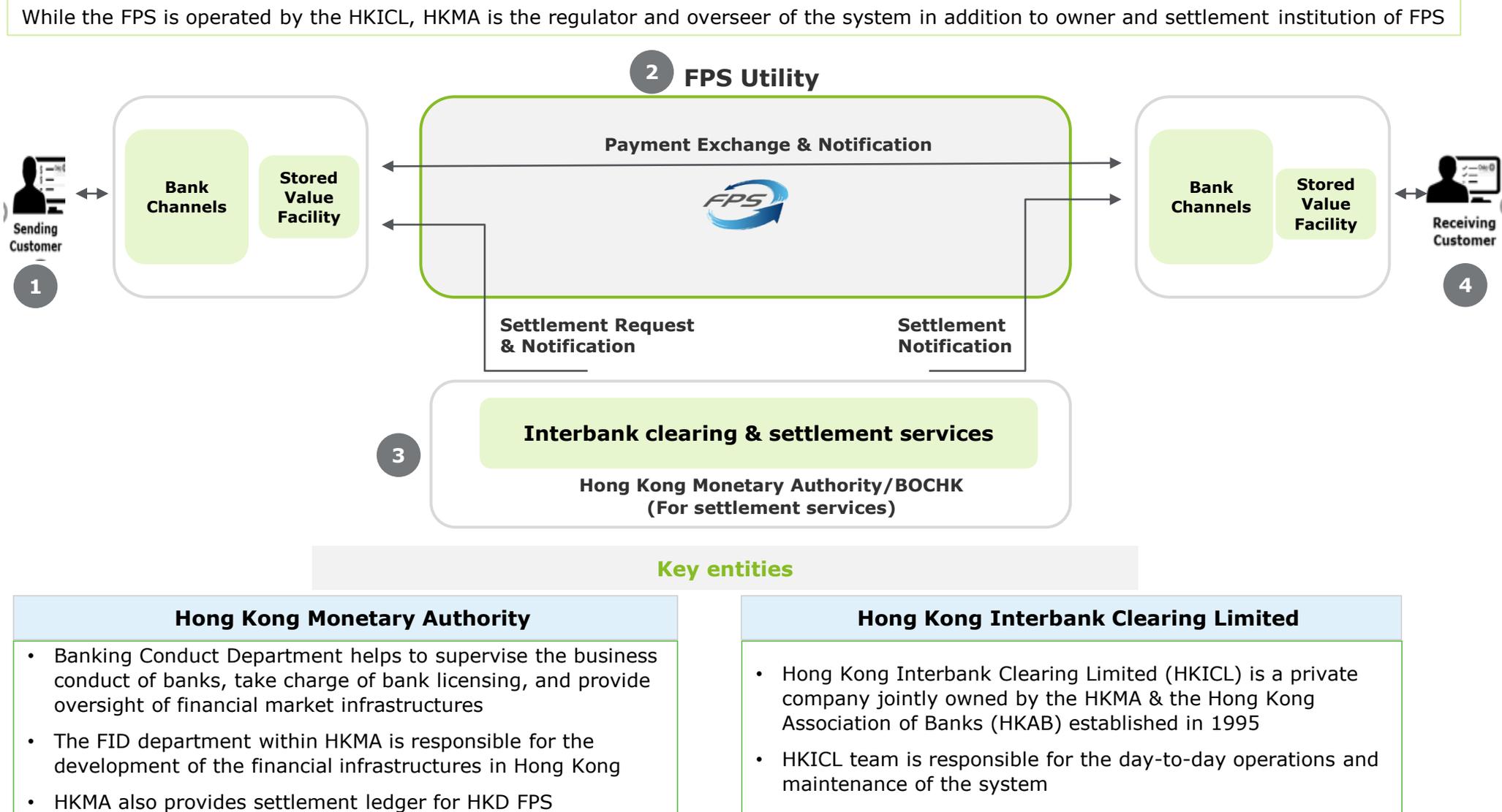
Chapter Summary:

- Hong Kong Interbank Clearing Limited (**HKICL**) is a private company jointly owned by the Hong Kong Monetary Authority (HKMA) and the Hong Kong Association of Banks (HKAB)
- It was entrusted with the **responsibility of operating the system** in Hong Kong SAR, China while **the HKMA retained the role of overseer of the system**
- Banks have direct participation in FPS as they maintain settlement account with HKMA and are called Settlement Participants (SPs) while SVFs have indirect participation as they engage an SP as their settlement service provider and are called Clearing Participants
- FPS **supports both bank account and SVFs with complete account to account interoperability** to make **individual, business and government transactions** in both the currencies and is accessible to customers via **mobile, e-banking & QR code**
- Users can access all FPS services via bank's own channel
- Maximum permissible transaction limit are defined by the participants based on their business model and liquidity concerns
- FPS supports **mobile number, email, FPS identifier** currently and will support **Hong Kong ID** from December 2020 as an alias. Mobile number continues to remain the most popular alias accounting for almost 2/3rd of all alias registrations
- FPS supports multiple use cases which results in more customer convenience and adoption. At present, FPS offers **P2P, merchant, bill, batch/bulk payments** to its users
- Users can also schedule **future payments** via their banks and **authorize direct debit** with all relevant security features. Setup of direct debit mandate is initiated by a payer through a FPS paying participant or FPS payee participant. After receipt of the mandate setup instruction, the receiving participant should verify the information and respond to accept or to reject

2.1. FPS Structure



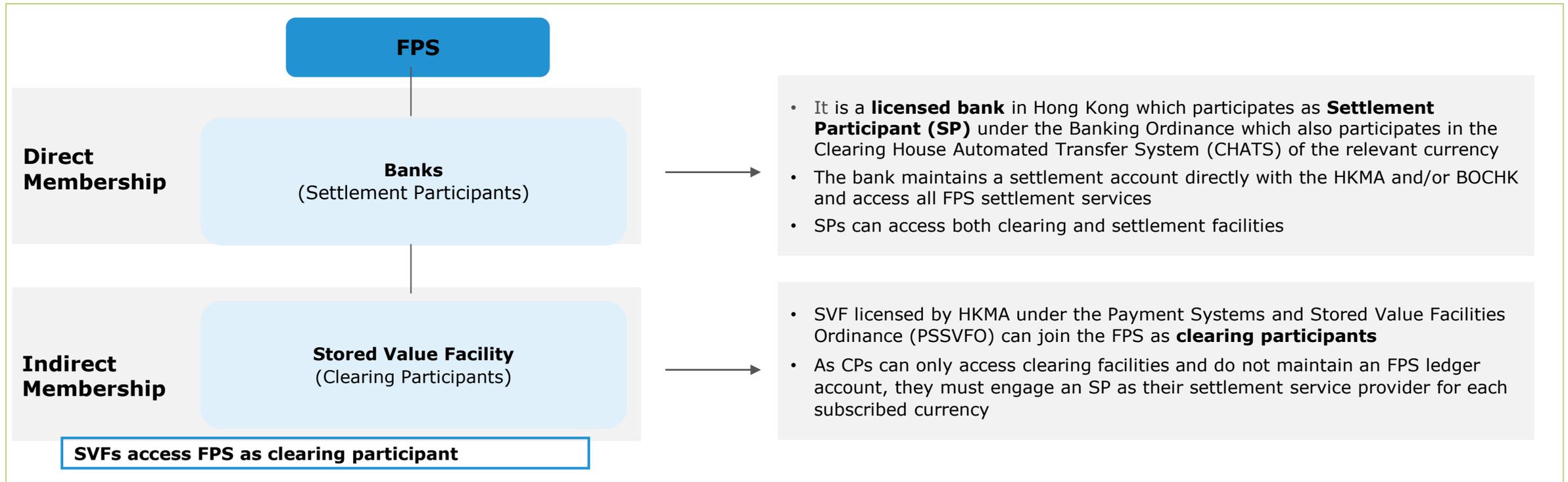
- The introduction of fast payments in Hong Kong SAR, China was enabled through the extension of existing CHATS system
- **HKMA** was the facilitator and the sponsor of the project
- **Banking Conduct Department of HKMA** is the overseer of the system
- The operational team of HKICL is responsible for operation of the system governed by various board and risk management committees



2.2. Participants(1/2)



Banks and non-banks/e-wallets (through indirect membership) participate in FPS. In particular, all licensed banks in Hong Kong are required to be a settlement participant (SP) regardless of the kind of FPS functions subscribed to.



Adoption Statistics (as on October-2020)

35 Retail Banks

12 SVFs

2.2. Participants(2/2)



- Banks access the FPS as **direct participants** as they maintain settlement account with the central bank for HKD and BOCHK for RMB
- SVFs access the system as **indirect participants** as they do not have direct settlement account with the central bank and settle on the books of a direct member
- Direct & indirect participants have been provided **full liberty to determine the nature of arrangement** between them
- There is **no difference** in experience of the end user irrespective of the type of participants it accesses the FPS with

Participation of SVFs in Hong Kong FPS

- In order to increase accessibility of FPS, **Stored Value Facilities (SVF)** were allowed to **participate indirectly**. Due to the different nature of SVF, there were **concerns on liquidity management** as they do not maintain account with HKMA. Therefore, SVFs were asked to **make indirect arrangement** via banks who have settlement accounts with HKMA
- Banks and SVFs have been given the **liberty to negotiate the arrangement** between them keeping in mind their liquidity concerns. Banks (SP) can set limit amount for individual SVFs (CP) basis their arrangement depending on funds available with the SPs. Banks can also **offer liquidity instruments** to their partner SVFs. Settlement of CP takes on the book of SP
- The FPS facilitates respective settlement participants to monitor and manage SVF liquidity balances. In the exceptional case where an SVF has liquidity issue, the case will be notified to the supervision department of the HKMA.

Regulatory Considerations for SVF participation

- HKMA upholds the security and effectiveness of the retail payment industry by executing the regulatory norms for SVFs in agreement with the PSSVFO. As per the PSSVFO, HKMA is authorized to license SVF issuers & undertake appropriate supervisory & enforcement functions
- Technical specifications prepared by HKICL were provided for joining participants to enhance their systems to get access to the FPS. This significantly enhanced customer experience in making merchant and business payments via the FPS using mobile devices.

Onboarding Process

- Enrolment with the Hong Kong Monetary Authority (HKMA) for Hong Kong Dollar FPS and/or Bank of China (Hong Kong) Limited (BOCHK) for Renminbi FPS
- Signing of confirmation letters agreeing to observe and abide by the HKD FPS Rules, RMB FPS Rules and relevant Operating Procedures respectively upon completion of enrolment
- After the completion of these onboarding process, HKICL will conduct testing with the intended participants to ensure they are technical ready to be onboard

Interoperability

- Transfers between banks and SVF is allowed
- Customers can initiate transactions from their own bank/PPI access channels
- Currently, **twelve SVFs** have already connected to the FPS and are providing real-time FPS services to their customers

2.3. Payment Instruments, Transaction Types and Channels



FPS enables payments via **banks account & e-wallets in both currencies** i.e., H.K Dollar & Chinese Reniminbi with the help of **mobile & internet banking and QR codes**

Payment Instruments Supported

Payment Instrument	Supported	Interoperability
 Credit Transfer	✓	<ul style="list-style-type: none"> Account to account interoperability supported Customers can transfer money from banks to SVFs and vice versa
 Direct Debit	✓	
 Stored Value Facility (E-money)	✓	

Payment Types, Limit and Currency

Payment Type	Transaction Limit	Transaction Currency
 Individual	<ul style="list-style-type: none"> No transaction limit has been defined by HKICL Banks are allowed to set up threshold limit for different use cases based on their business models & risk control management 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>HK \$</p> </div> <div style="text-align: center;">  <p>¥</p> </div> </div> <ul style="list-style-type: none"> Customers may register a multi-currency account which can receive both HKD and RMB, and there is no need for a separate registration Both currency payments are not interoperable between each other, and are settled by two different institutions
 Business		
 Government		

Access channels and Agent networks



Mobile



Internet



QR Code

- FPS allows transactions across mobile banking, SVF apps, e-banking and with the use of QR codes
- Currently **agent mode or any other assisted mode of transfer is not supported** by the FPS

2.4. Aliases



FPS enables simple addressing of payments via three aliases. It also plans to introduce the use of HKID number as an alias for payment

Aliases

- Payers can make use of **addressing proxy identifiers** of payee's account number to make a payment (i.e., Payees do not need to disclose account numbers to payers). FPS follows a **One-to-many addressing design**, i.e., one proxy can be linked to multiple banks but within one bank one can link to only one customer. The first registered participant account for a proxy ID will become the default account to receive payments, customers can change default account at their own discretion if they register more than one account
- Currently **mobile number, email and FPS ID supported** as aliases. There is a central registry in FPS for mapping of proxy identifiers to the specific customer of a bank/e-wallet. Centralised database registry can be accessed by FPS participants and is subject to tariff

1

Mobile number

~66% of all registrations*

- Customer can register multiple banks/e-wallets with the same mobile number
- Customer to designate a default bank/e-wallet to receive money

2

Email address

~ 17% of all registrations*

- For each bank/e-wallet, one email address for one customer only
- Customer to designate a default bank/e-wallet to receive money

3

FPS identifier

~ 17% of all registrations*

- Unique ID generated by FPS
- Mainly for merchant/corporate as payee (but also support individuals)
- One FPS ID mapped to one customer of one bank/e-wallet only
- Assigned FPS ID cannot be transferred to another bank/e-wallet

4

HKID number

(to be introduced in Dec 2020)

- Facilitate payments using HKID number as payee identifier
- To be used only for G2P & B2P payment
- Only bank account can register for HKID number addressing proxy, SVF's e-wallets are not eligible to register for the same addressing proxy
- Not allowed to be used for P2P payments

2.5. Use Cases/Services

Merchant Payments (P2M)

- The HKMA works with the industry to extend FPS usage from person-to-person payments to merchant payment
- Enhancements were made to enable merchants to use a variety of proxy identifiers and accept partial or over-payments via a QR code

Payment Instruments

Credit Transfer & SVF

Access Channels

Mobile

QR

Internet

Request to Pay using QR code

- Participants can leverage on the core service of FPS to provide the following payment services to their customers using QR code:
 - P2P payments
 - e-Commerce payments
 - Electronic bill payments

Payment Instruments

Credit Transfer & SVF

Access Channels

QR

Mobile

Bulk / Batch Payments

- FPS supports batch mode operations in addition to real-time fund transfers
- Batch (Outward to real time Inward mode)
- Batch Mode (Outward and Inward*)

*On Weekdays: Mandatory for payee banks to receive & apply funds for three batches delivered at 08:30, 14:30 & 17:00

Payment Instruments

Credit Transfer & SVF

Access Channels

Banks own channels*

Bill Payments

- Registration is not compulsory for bill payment
- User needs to enable the QR Code scanner of mobile banking app or e-wallet, which supports bill payments through FPS QR Code
- Users can then use it to scan the FPS QR Code printed on the bills to make payment

Payment Instruments

Credit Transfer & SVF

Access Channels

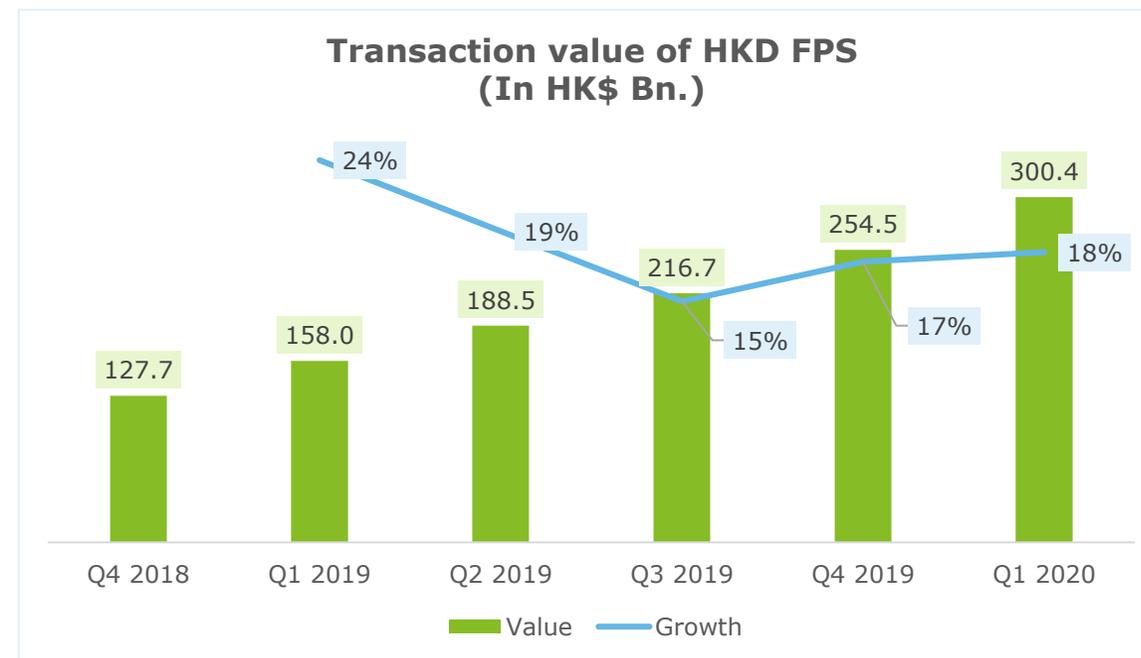
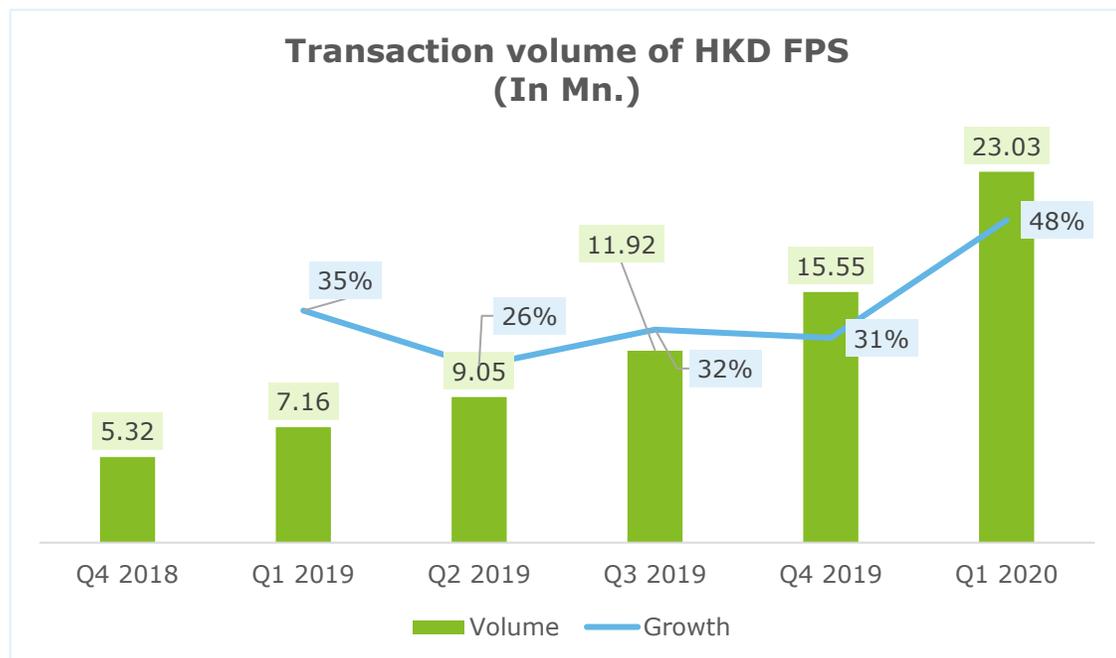
Mobile

QR

Internet

*As per HKMA, all channels provided by the bank can be utilized for bulk/batch payments
 Source: HKICLI | HKMA | Primary Interview

3. User Adoption



- **FPS has had a series of Q-o-Q increase in transaction volume and value** since its launch in September 2018. In 2019, as more banks and SVF adopted the system, FPS saw continuous growth in terms of volume and value

Key Factors for high user adoption

- HKMA undertook range of **publicity measures** to popularize FPS before its launch through advertisements detailing out its benefits to the users. **HKMA developed a new series of education and publicity materials, such as announcements in the public interest for broadcast on television and radio, as well as videos and electronic banners for digital platforms.** HKMA also participated in trade fairs to promote the FPS to small and medium-sized enterprises (SMEs) and corporates
- Various FPS participating banks and SVFs **launched promotion campaigns and offered incentives** to encourage customers to register with the FPS and to use it for fund transfer and bill payment

4. Technical Details and Payment Process

Chapter sections:

4.1. Technical Details | Messaging Format & APIs

4.2. Technical Details | QR code, Customer Authentication and Tokenization

4.3. Payment Process (Customer Registration, Transaction Fulfilment, Liquidity Management and Settlement)



Chapter Summary:

- Hong Kong FPS adopted **ISO 20022** messaging standard because of its wide acceptance and use of standardized Chinese characters
- FPS supports **merchant presented EMV standard QR code** which can be used for P2P, merchant payments, ecommerce payments, for paying bills/dues, etc.
- Under its smart banking initiative, HKMA also launched **common QR code standard** for retail payments in Hong Kong, releasing a free mobile app known as HKQR (Hong Kong Common QR Code) which converts multiple QR codes from different payment service providers into a single QR code. **FPS QR code is also supported in common QR standard**
- Banks & SVFs have to provide **for two factor authentication** as mandated by HKMA. No additional authentication measures were imposed by FPS post its launch
- FPS allows registration to all users via a simple process where they may link their bank account with one or more of the aliases
- Clearing of all transactions takes place through HKICL done on the books maintained by the HKMA for Hong Kong Dollar and Bank of China (H.K) for Chinese Renminbi
- While HKMA has provided for limited use of APIs for certain functions, FPS **does not have an API arrangement** with any player currently.

4.1. Technical Details | Messaging Format and APIs



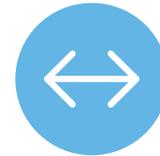
Below are the technical details of FPS covering the **messaging format & use of open APIs**. The messaging standard is extremely important in terms of connectivity and interoperability. Hong Kong FPS **is yet to integrate open APIs** into its system but continues to monitor the space very closely



Messaging Format

ISO 20022

- The FPS has adopted the latest **ISO20022** international messaging standard, which also applies to all participants for sending and receiving messages through the FPS
- The ISO20022 was adopted because it provides a **rich data format and allows the use of standardized Chinese characters**, which better meets the need of the participants in carrying different kinds of payments through the FPS
- The ISO20022 has also been adopted widely worldwide and therefore would provide **easier integration with other payment systems** when FPS enables cross border payments



APIs

Limited Purpose APIs

- In Hong Kong, the regulator HKMA provides for use of APIs in areas like Market Data & Statistics and other Bank & SVF related information
- Open APIs are restricted to a few organizations on a strict need to know basis from a business and security point of view
- Currently, Hong Kong's FPS does not have API arrangements with any player. HKMA continues to actively monitor the situation, and will allow the operator and participants to use APIs when they become vital to FPS

4.1. Technical Details | QR Code, Customer Authentication and Tokenization



Below are the technical details of FPS covering **the QR standards and customer authentication**. FPS has adopted **merchant presented EMV standards** for its QR code which is completely compatible with the common QR standards of Hong Kong SAR, China. Participants in FPS have to ensure **two factor authentication** to ensure transaction security



QR Code

- QR code in FPS can be used for P2P, merchant payments, e-commerce payments, for paying bills/dues, etc. Public utility companies have also started using QR codes on the bill to pay via FPS. At present, FPS only supports **Merchant presented QR code**
- HKMA also worked with industry in Dec-2017 to issue **another standard called common QR code specification** which is also for merchant presented mode. The specification aims at enabling merchants to convert multiple merchant presented QR codes into a single common QR code. It is designed for accepting different payment schemes using one single QR code. **FPS QR code is also supported in the common QR standard.**
- **Both FPS and common QR standards conform to the EMV QR standards.** EMV QR standards were adopted because it is well established and would ensure complete interoperability as it would make it easy for other PSPs to migrate their QR code standards to the one of common QR code. Not much localization or customization was needed to the EMV standard QR code for adopting in FPS
- **Consumer presented QR code is in agenda** but currently there is no urgent need or strong demand in Hong Kong for the same



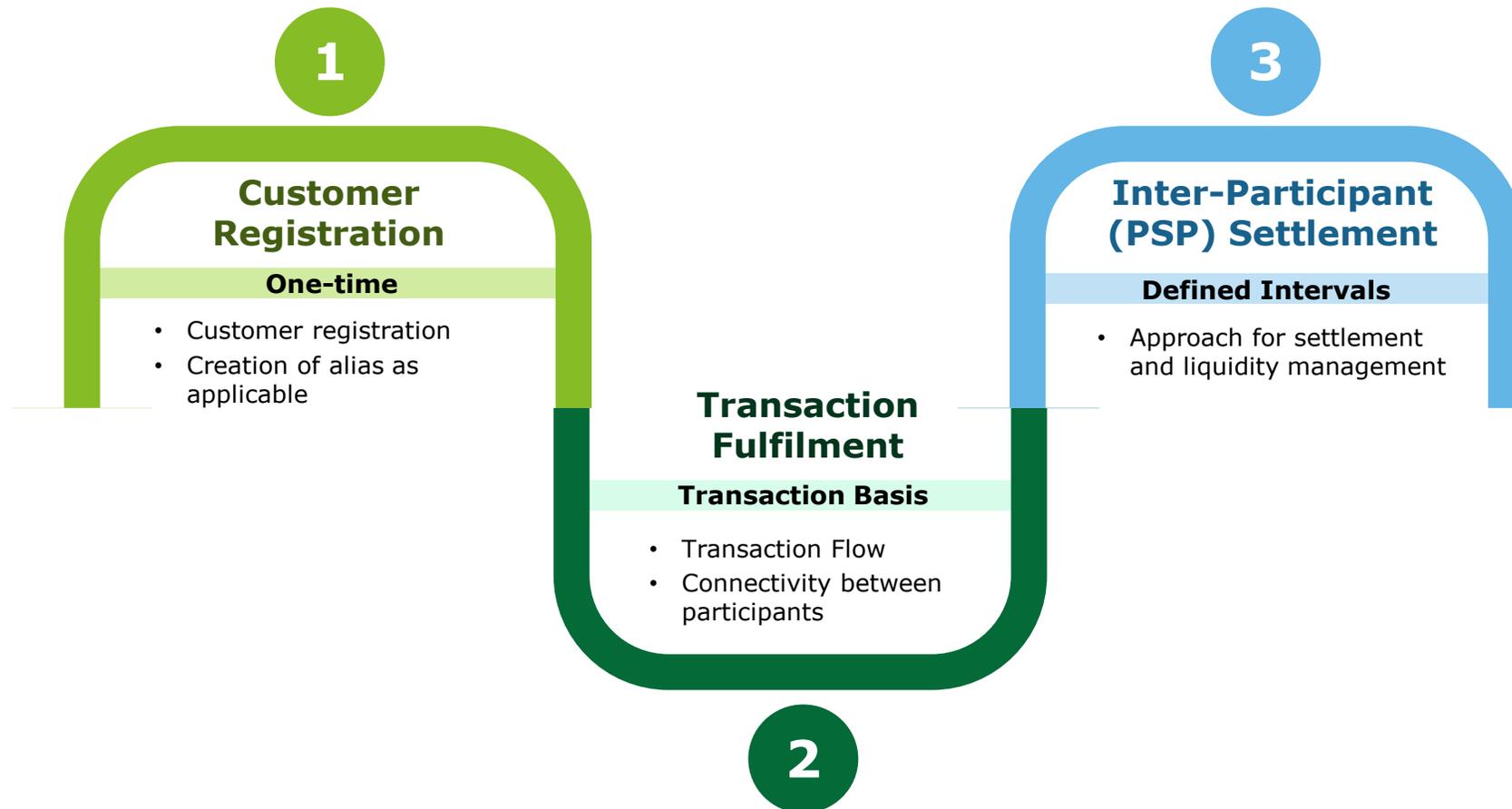
Customer Authentication

- For Customer authentication guidelines have been issued to the banks and SVFs by HKMA
- **All banks and SVFs have to ensure, two factor authentication**
- Participants should fulfil all the relevant regulatory requirements and guidelines issued by HKMA and guidelines issued by HKAB as appropriate in processing the payment. This may include any authentication requirements depending on the riskiness of the transactions as determined by factors such as the size of transaction
- FPS does not impose any additional customer authentication measure other than those mandated by the HKMA

4.2. Payment Process



Various steps in the payment process include **one-time customer registration, payer-payee transaction fulfilment and inter-participant settlement**. Subsequently, various aspects related to these areas are covered





4.2. Payment Process | Customer Registration



FPS has a simple registration process for customer to link their bank account with the alias of their choosing

Customers chooses an account to link up with mobile number or email address through internet banking, mobile banking or e-wallets

Customer goes through verification to confirm the mobile number or email address or any other alias

Customers can link up mobile number or email address with more than one bank or e-wallet and set one of them as default receiving account

FPS follows a **One-to-many addressing design**, i.e., one proxy can be linked to multiple banks but within one bank one can link to only one account

Participant A

Name
ABC XYZ

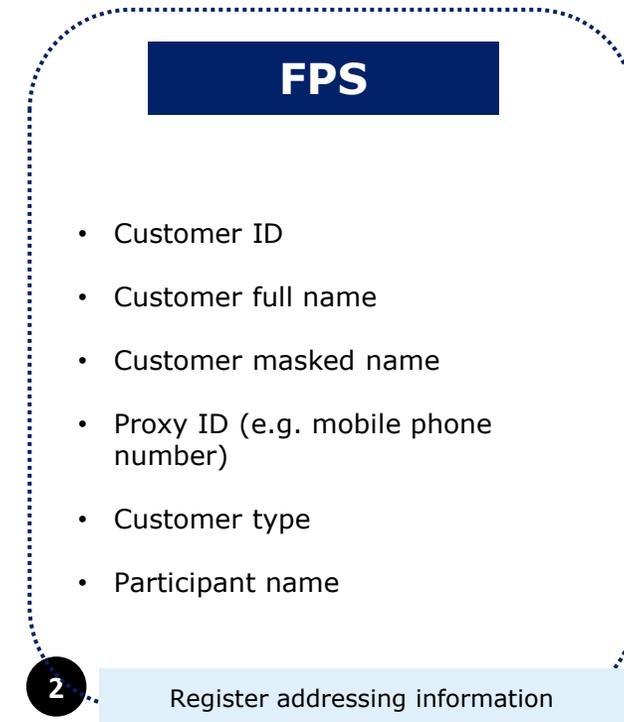
Account number
XXX-XXXXX

Mobile phone number
12345678

Use this account as the default account

Confirm to register this account with the FPS Addressing Service

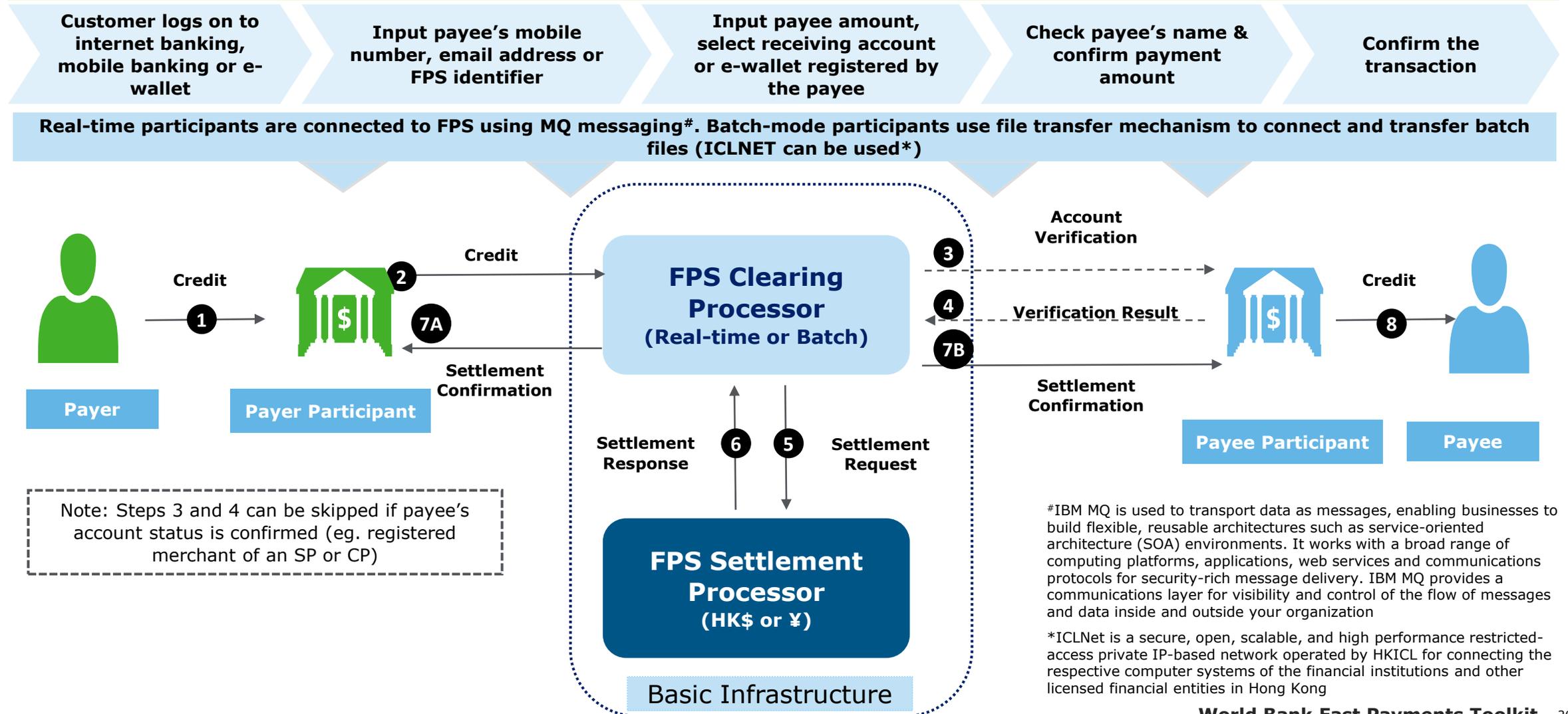
Confirm



4.2. Payment Process | Transaction Fulfilment



The FPS allows customers of a participant to make payments from their account to a customer of another participant with immediate funds availability to the payee. From the perspective of the customers, the **process is simple and takes only seconds**. However, there are **a number of confirmation, clearing steps and settlement steps** that occur in quick succession to make this happen



#IBM MQ is used to transport data as messages, enabling businesses to build flexible, reusable architectures such as service-oriented architecture (SOA) environments. It works with a broad range of computing platforms, applications, web services and communications protocols for security-rich message delivery. IBM MQ provides a communications layer for visibility and control of the flow of messages and data inside and outside your organization

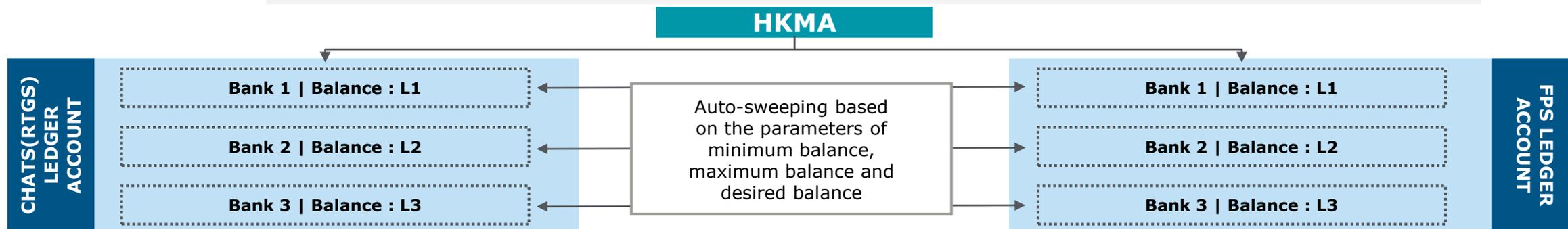
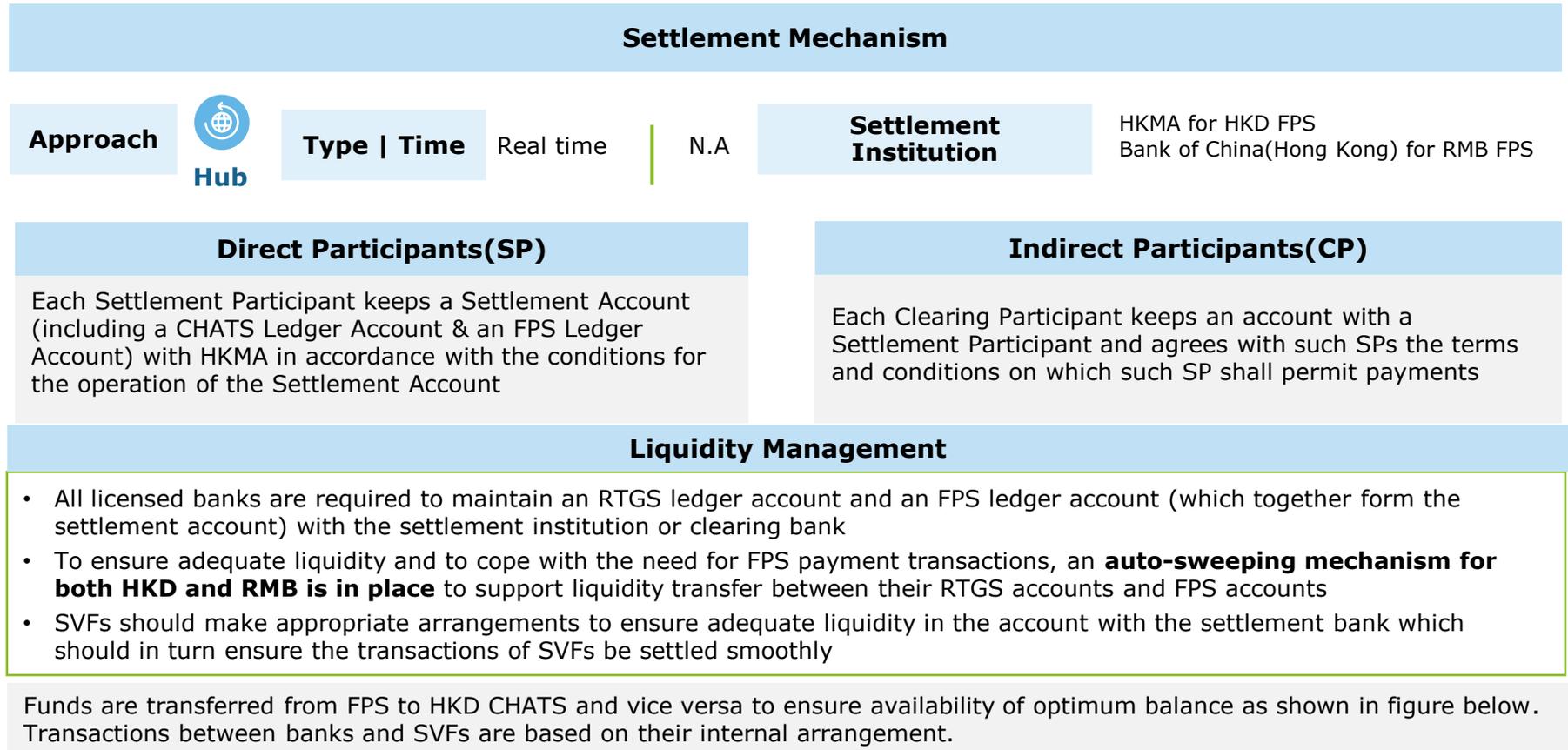
*ICLNet is a secure, open, scalable, and high performance restricted-access private IP-based network operated by HKICL for connecting the respective computer systems of the financial institutions and other licensed financial entities in Hong Kong



4.2. Payment Process | Liquidity Management and Settlement



- Direct participants settle directly with HKMA while indirect participants settle via Direct Participants
- For liquidity management, each bank maintains one **settlement account with the HKMA or Bank of China (depending on currency)** with **two ledger balances**, one in the CHATS system & another in the FPS
- **Auto-sweeping** mechanism is in place between the two ledgers to manage liquidity



5. Governance Framework

Chapter sections:

- 5.1. Legal and Regulatory Aspects
- 5.2. Risk Management
- 5.3. Customer Complaints



Chapter Summary:

- The Payment Systems and Stored Value Facilities Ordinance (**PSSVFO**) provides the legal **basis** for the powers of the HKMA in relation to the oversight and regulation of payment system
- HKMA follows a risk-based oversight approach to continuously monitor and assess the compliance of FPS with the relevant requirements using a variety of techniques, including on-site examination, off-site reviews and continuous monitoring, meetings with management of FPS and independent reviews, with the aim of detecting any problems at an early stage
- All risk management regulations mandated by HKMA for payments system in Hong Kong were also applicable on FPS since its inception in 2018
- FPS has adopted the extensive **Cyber Fortification Initiative of HKMA** including all its detailed guidelines to raise the level of cyber resilience in its system while HKICL has been entrusted with the responsibility of managing all FPS data in a safe and secure way
- Dispute Resolution for customers is guided by the procedures laid down in circulars issued by the Hong Kong Association of Banks (HKAB) and the DTC Association (DTCA) on **“Handling Procedures for Following up Mis-transfer of Funds Reported by Customers”**
- The guidelines lay down step by step redressal procedures to be adopted by banks and SVFs in case of any customer complaint regarding mis-transfer of fund. Apart from redressal mechanism, the guidelines also focus on **training** of bank/SVF staff for handling customer complaints and also **customer education** on their responsibilities and rights

5.1 Legal, Regulatory and Governance Aspects



The laws of Hong Kong SAR, China form the legal basis for the operations of FPS, supplemented by various statutes, regulations and contractual provisions. All the relevant documents are governed by Hong Kong SAR, China law and are legally binding and enforceable

Institutional and Governance Framework

Legal Framework:
Payment Systems and Stored Value Facilities Ordinance (PSSVFO)

Regulator and Overseer: HKMA

System Operator:
HKICL

As per the details present on HKMA's website

- The Clearing and Settlement Systems Ordinance (CSSO), which came into effect on 4 November 2004, established a statutory regime for the Hong Kong Monetary Authority (HKMA) to designate and oversee Clearing and Settlement Systems (CSSs) that are material to the monetary or financial stability of Hong Kong or to the functioning of Hong Kong as an international financial center. The HKMA is therefore empowered to designate and oversee CSSs on an ongoing basis to ensure their compliance with the CSSO
- On 13 November 2015, the CSSO was amended and retitled as the **Payment Systems and Stored Value Facilities Ordinance (PSSVFO)** to introduce a regulatory regime for stored value facilities and retail payment systems in addition to the existing oversight framework for CSSs under the pre-amended CSSO. As far as the designated CSSs are concerned, all designations, certificates of finality and exemptions granted under the pre-amended CSSO continued to have effect under the Ordinance
- Pursuant to PSSVFO
 - Payments settled in the FPS enjoy settlement finality as it is an extension of CHATS to which the certificate to finality is issued under PSSVFO
 - The certificate of finality provides statutory backing for the finality of settlement of transactions settled through the system
 - This finality is protected from insolvency laws and other laws by the PSSVFO.
 - This ensures that transactions settled are final and irrevocable and will not be reversed in circumstances, including the insolvency of a system participant, whereas any rights resulting from the underlying transaction of any such transaction will be preserved
- With the above context, **Payment System & Stored Value Facility Ordinance (PSSVFO) 2015** which was already applicable to HKD CHATS was also made applicable to FPS on its launch in 2018

5.1 Legal, Regulatory and Governance Aspects



As the designated authority under the Payment Systems and Stored Value Facilities Ordinance (PSSVFO), HKMA issued various regulations and guidelines for payment systems and participants, and is also performing its oversight function through offsite and onsite inspections

Institutional and Governance Framework

Legal Framework:
Payment Systems and Stored Value Facilities Ordinance (PSSVFO)

Regulator and Overseer: HKMA

System Operator:
HKICL

As per the details present on HKMA's website

- Under the PSSVFO Ordinance, 2015, HKMA is responsible for designating and overseeing FPS with a view to promote the general safety and efficiency of the operations
- By monitoring the compliance of FPS with its obligations stipulated in the PSSVFO, HKMA aims to protect the monetary and financial system in Hong Kong from possible destabilizing effects arising from the disruption to the functioning of any of those system

Payment System Oversight:

- Oversight is primarily a **combination of offsite supervision and onsite inspection**
 - **Offsite review:** Primary means for oversight and conducted through:
 - Off-site reviews and continuous monitoring form the core of the HKMA's oversight approach. The reviews enables the HKMA to evaluate the degree of compliance of Financial Market Infrastructure(FMIs) under its purview with the relevant requirements and to conduct cross-institutional or peer group analysis
 - Monthly information is collected on transaction volumes and values, system performance statistics, incidents of default and non-compliance with operating rules, and significant events in the coming months
 - In addition, the HKMA also requires the System Operators (SOs) and the Settlement Institutions(SIs) under its purview to provide supplementary information for off-site reviews. The information includes submissions of periodic independent reviews on various risk areas, business continuity plans, and data on the financial strength and commitment of the SOs and the SIs
 - **Onsite inspection**
 - On-site examinations are conducted when necessary and their frequencies vary as per the discretion of central bank. In general, the scope of an on-site examination focuses on priority areas identified through the off-site review. These include high-risk areas or where control process validations are needed. An on-site examination report, identifying any area of weakness or concern and making recommendations for remedial action, are issued to the SOs and the SIs
- To supplement off-site reviews and on-site examinations, the HKMA may also request the SOs and the SIs to submit an independent review conducted by professional parties on high-risk areas or other areas of concern
- The HKMA holds annual meetings with senior management of the SOs and the SIs to discuss the findings of the off-site reviews (and on-site examinations if conducted), particularly any significant deficiencies in safety and efficiency identified, or any other matters of concern or mutual interest.

5.1 Legal, Regulatory and Governance Aspects



The Settlement Institution i.e. HKMA has appointed HKICL as the System Operator of the HKD CHATS/FPS. Accordingly, HKICL has published rules on the operations of both HKD & Rmb FPS which is mandatorily applicable on all the participants of the system

Institutional and Governance Framework

Legal Framework:
Payment Systems and Stored Value Facilities Ordinance (PSSVFO)

Regulator and Overseer: HKMA

System Operator:
HKICL

HKICL Governance and Authorization:

- Hong Kong Interbank Clearing Limited (HKICL) is a private company jointly owned by the Hong Kong Monetary Authority (HKMA) and the Hong Kong Association of Banks (HKAB)
- HKICL was established in May 1995 to take over in phases the clearing functions provided by the former management bank of the Clearing House, The Hong Kong and Shanghai Banking Corporation Limited, and the process was completed in April 1997
- As per the mandate given by the HKMA, HKICL shall, subject to the provisions of these FPS Rules & in accordance with the FPS Operating Procedures, provide, manage & operate the FPS Facilities & make available the FPS Facilities to all the participants
- HKICL operates both HKD FPS and RMB FPS

Enforcement of guidelines across FPS:

- The FPS Rules have been made by HKICL with the approval of HKMA
- The FPS rules apply mandatorily to:
 - Settlement Participants
 - Clearing Participants
 - Payments by HKMA to Participants, or by Participants to HKMA
- HKICL has the authority to issue operating procedures for the FPS Facilities and to amend such FPS Operating Procedures from time to time as it thinks fit with HKMA's approval
- These FPS Rules and the FPS Operating Procedures are binding on the Participants. Participants need to comply with and observe all laid down guidelines in the same
- HKICL will monitor performance by Participants of their obligations under these FPS Rules
- In the event that HKICL becomes aware of any non-performance by any Participant of its obligations under these FPS Rules, HKICL shall inform the Participant concerned and require it to ensure performance of the relevant provision
- Each Participant shall have systems in place which are complementary to HKICL's contingency arrangements so as to enable HKICL to ensure the timely recovery of its usual operations in the event of the occurrence of an adverse contingency affecting such operations

5.2. Risk Management (1/3)



- Before the launch of FPS, **HKMA had put in place a robust risk management framework** covering wide ranging risks like operation , liquidity, technology, information, fraud, settlement risk, etc. for the existing systems
- With the launch of FPS in 2018, **all preexisting risk management guidelines were directly applicable to FPS while certain additional measures particularly for liquidity risk were introduced** due to the instant nature of payments

Legal and Regulatory Basis

- In order to manage the credit risk, legal basis is provided to '**settlement finality**' and the operator (HKICL) has been mandated by the HKMA to make available the services of the FPS Facilities to the Participants

Real time settlements

- Interbank payments are settled continuously on a gross deal-by-deal basis across the book of the HKMA (for HKD) and BOCHK (for RMB) as long as there are sufficient funds in the FPS ledger accounts of HKD/RMB FPS participants
- Settlements are **irrevocable and enjoy immediate finality** with the statutory backing of the PSSVFO

Liquidity Management

- Sweeping mechanism is in place in CHATS and FPS to support liquidity transfer between HKD CHATS ledger accounts and HKD FPS ledger accounts of SPs during the CHATS operating hours
- To facilitate banks' liquidity management for settling FPS transactions during the period after the HKD CHATS is closed, **banks are allowed to borrow HKD funds from the HKMA, by entering into sale and repurchase transactions** for the provision of interest-free HKD funds for use in the FPS, namely the FPS DW repo transactions
- Settlement Institution only accepts securities issued by the HKMA (EFBNs) for repo and FPS DW repo and hence do not incur credit exposure to any other third-party issuers of the repo securities

No loss sharing arrangement

- There **is no loss-sharing arrangement** in FPS. Transactions will only be settled when there are sufficient funds in the FPS Ledger Accounts
- Each participant has a responsibility to ensure that it has sufficient liquidity to effect its payments in a timely and orderly manner
- Default procedures are in place and regularly drilled to minimize the impact of a default on the system and the participants

5.2. Risk Management (2/3)

Defined guidelines and Framework	<ul style="list-style-type: none">• Pre-existing risk management frameworks and guidelines for other payment systems in Hong Kong were directly applicable on FPS post its launch in 2018• Risk management framework clearly defines the roles & responsibilities of the Board of Directors, Risk committee, Management, Risk owners, etc. and cover various risk areas such as operational risk, IT risk, security, cyber resilience, etc.• Risk assessment was done at the beginning of the project. There was prelaunch audit assessment and regular internal /external audits are performed to check for any vulnerabilities. Recommendations are implemented according the prescribed timeline to mitigate any risk identified• In terms of day-to-day operational risks, system operation is monitored continuously in terms of transaction volume, response time, whether service levels are met, system health monitoring, etc. Instant response procedure in case of system/operational incident has also been developed. Business continuity and contingency plans are also in place.
KYC / AML	<ul style="list-style-type: none">• As FPS does not deal directly with end customers, the participants have to ensure KYC, AML/CFT¹ norms are met as mandated by the HKMA• HKMA has issued comprehensive regulatory requirements for e-banking services, KYC, AML, CFT, etc. for banks and SVFs
Data & System Management	<ul style="list-style-type: none">• HKICL is responsible for the day-to-day computer and data operations, clearing services and management of HKD CHATS/FPS on the terms and conditions set out in the service agreement signed between the HKMA (as SI) and HKICL. It is also responsible for system development as well as any equipment upgrade and maintenance• External and/or internal audits are organized to assess critical aspects of the company by carrying out, where applicable, regular information technology audits, operations audits, compliance assessments, etc.• HKICL has obtained certification under two ISO systems and established associated risk management frameworks: the ISO27001 standards for Information Security Management System and ISO9001 for Quality Management System

¹ Anti-Money Laundering and Counter-Terrorist Financing Ordinance (AMLO)

5.2. Risk Management (3/3)

Cyber Security

In light of increasing cyber threats, regulators across the globe are focusing their efforts on improving the cybersecurity of banking systems. The Hong Kong Monetary Authority (HKMA) announced the launch of the 'Cybersecurity Fortification Initiative' (CFI), a new scheme designed to enhance the resilience of Hong Kong banks to cyber attacks. The CFI consists of three pillars

1. Cyber Resilience Assessment Framework (C-RAF) is a risk-based framework for Authorized Institutions to assess their own risk profiles and benchmark the level of defense and resilience that would be required to accord appropriate protection against cyber attack

○ The assessment comprises three stages:

- Inherent Risk Assessment – This facilitates an Authorized institution(AI) to assess its level of inherent cybersecurity risk and categorize it into “low”, “medium” or “high” in accordance with the outcome of the assessment
- Maturity Assessment – This assists an AI in determining whether the actual level of its cyber resilience is commensurate with that of its inherent risk. Where material gaps are identified, the AI is expected to formulate a plan to enhance its maturity level
- Intelligence-led Cyber Attack Simulation Testing (iCAST) – This is a test of the AI’s cyber resilience by simulating real-life cyber attacks from adversaries, making use of relevant cyber intelligence. AIs with an inherent risk level assessed to be “medium” or “high” are expected to conduct the iCAST within a reasonable time

2. Professional Development Programme (PDP)

- The PDP is a localized certification scheme and training program for cybersecurity professionals developed by the HKMA in collaboration with the Hong Kong Institute of Bankers and the Hong Kong Applied Science and Technology Research Institute
- It is an integrated and well-structured program to train and nurture cybersecurity practitioners in the banking and information technology industries, and to enhance their cybersecurity awareness and technical capabilities of conducting cyber resilience assessments and simulation testing

3. Cyber Intelligence Sharing Platform (CISP)

- The CISP provides an effective infrastructure for sharing intelligence on cyber attacks. The timeliness of receiving alerts or warnings from a commonly shared intelligence platform can help the whole banking sector prepare for possible cyber attacks

5.3. Customer Complaints(1/2)

Customer Complaints



- Dispute Resolution for customers is guided by the procedures laid down in circulars issued by the Hong Kong Association of Banks (HKAB) on **“Handling Procedures for Following up Mis-transfer of Funds Reported by Customers”** which licensed banks & SVFs must adopt

- The Handling Procedures applies to reports by customers who have made payments to wrong recipients through any channel effected via the FPS

- **The procedures were brought into effect from 25th March 2019**

Handling Procedures as per the circular (1/2)

HKMA has laid down detailed set of procedures to be followed by banks & SVFs when **customer complains of transaction being processed to a wrong recipient**. The guidelines are as follows:

1. When the transferor reports a case of mis-transfer of funds to the transferor’s bank or SVF, the Transferor’s Institution must request the transferor to provide relevant information to facilitate follow-up actions and obtain consent from the transferor for the sharing of these information with the Transferee’s Institution, the Transferee and the Hong Kong Police Force (“Police”) as appropriate for the purpose of handling the mis-transfer of funds
2. The Transferor’s Institution must provide a written acknowledgement of receipt to the transferor by post, e-mail or SMS no later than the close of business of the next business day after receiving the transferor’s report
3. The Transferor’s Institution on behalf of the transferor and within 2 working days after receiving the transferor’s report, requests the transferee’s bank or SVF to
 - (a) Inform the transferee of the matter and
 - (b) Confirm with the transferee if any funds were mis-transferred and, if so, obtain the transferee’s authorization of returning the mis-transferred funds
4. The Transferee’s Institution must provide necessary information (e.g., the transferee’s bank statements, transaction records, or details of the relevant transaction, such as the transferee’s relevant bank account number, transaction date, transaction amount, transactional channel and transactional narrative (if any)) that could help the transferee to determine in a timely and helpful manner if the funds were mis-transferred to them
5. If the Transferee’s Institution does not receive a response from the transferee within a reasonable period, it should contact the transferee through registered mail to obtain the transferee’s authorization of returning the mis-transferred funds
6. The Transferee’s Institution is responsible for documenting the work done and providing a written confirmation listing the dates, all the actions taken in negotiating with the transferee and the results to the Transferor’s Institution within 15 working days from the date of receipt of the request from the Transferor’s Institution
7. Transferor’s Institution is also required to maintain a proper record and documentation so that it can answer the related queries raised by the transferor from time to time
8. The Transferor’s Institution must send a final written response to the transferor within a reasonable period (normally not exceeding 20 working days from the date of receipt of the transferor’s report

5.4. Customer Complaints(2/2)

Customer Complaints



- Customer complaint guidelines applies both to banks and SVFs
- In the case of intra-bank fund transfer where the Transferor's **Institution and the Transferee's Institution is the same bank or SVF** licensee, the bank or SVF must carry out all the measures and procedures as mentioned accordingly

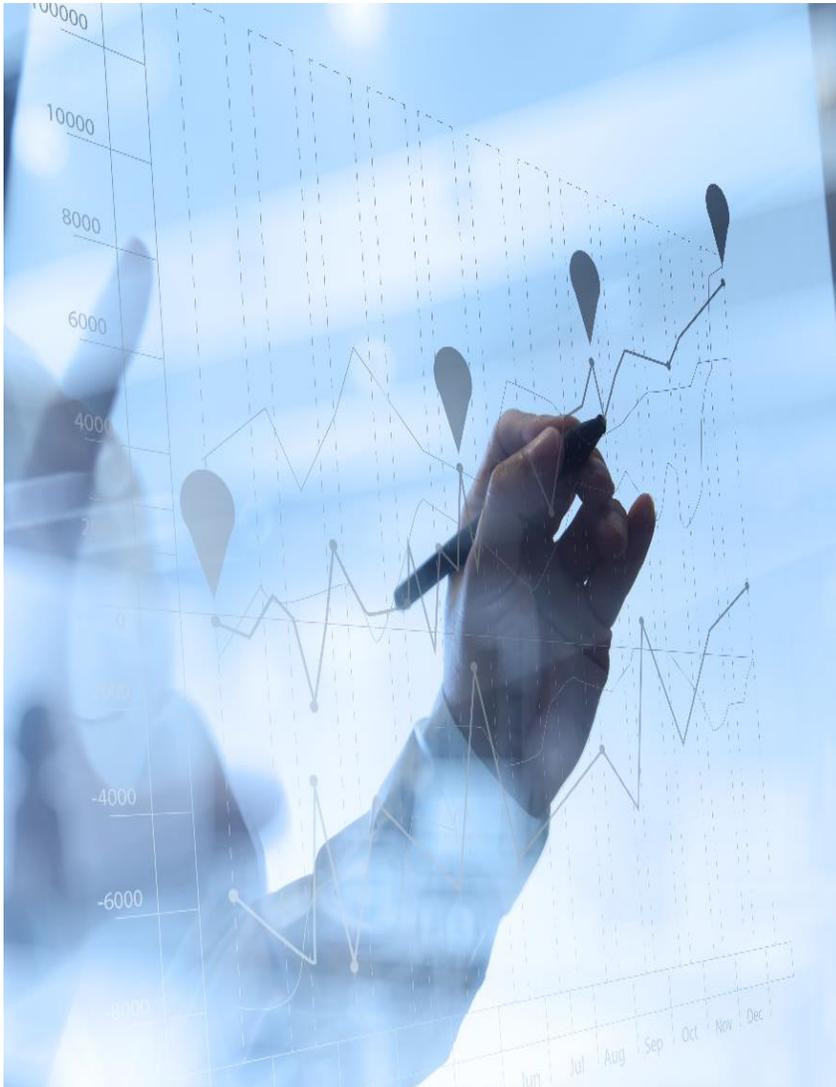
Handling Procedures as per the circular (2/2)

6. The final written response should include written confirmation from the Transferee's Institution with details of the dates and all the actions taken in the negotiation with the transferee and the results, without disclosing the personal data of the transferee. Such information
 - (a) Could assist the Police to assess whether the matter suggests a case of crime and
 - (b) May facilitate the transferor to consider taking further appropriate actions
7. If the funds cannot be recovered through the above process, the Transferor's Institution must inform the transferor the options available to them – such as reporting to the police or seeking independent legal advice on possible legal actions for recovering the funds as necessary
8. The Transferor's Institution and Transferee's Institution must provide appropriate assistance to the transferor to seek to obtain the transferee's authorization of returning the mis-transferred funds even after a final written response has been issued to the transferor
9. If authorization is obtained from the transferee for returning the funds, the Transferee's Institution must recover & return the funds to the Transferor's Institution as soon as practicable. The Transferor's Institution then must return the funds to the transferor as soon as practicable

Staff training & customer education as per the circular

- All banks & SVFs must conduct sufficient staff training on handling enquiries on mis-transfers of funds, including informing the customer who has reported such a case about the assistance the bank or SVF will provide to the customer
- Banks & SVFs must undertake appropriate customer education through appropriate channels to
 - (i) remind customers to be careful and avoid errors when making fund transfers
 - (ii) remind customers to return the mis-transferred funds through the banks if they have received funds that are mis-transferred to them, and the possible criminal liability if they do not return the mis-transferred fund

6. Annexure



Chapter sections:

6.1. Key Features

6.2. HKMA Smart Banking Initiative

6.3. Direct Debit transaction process

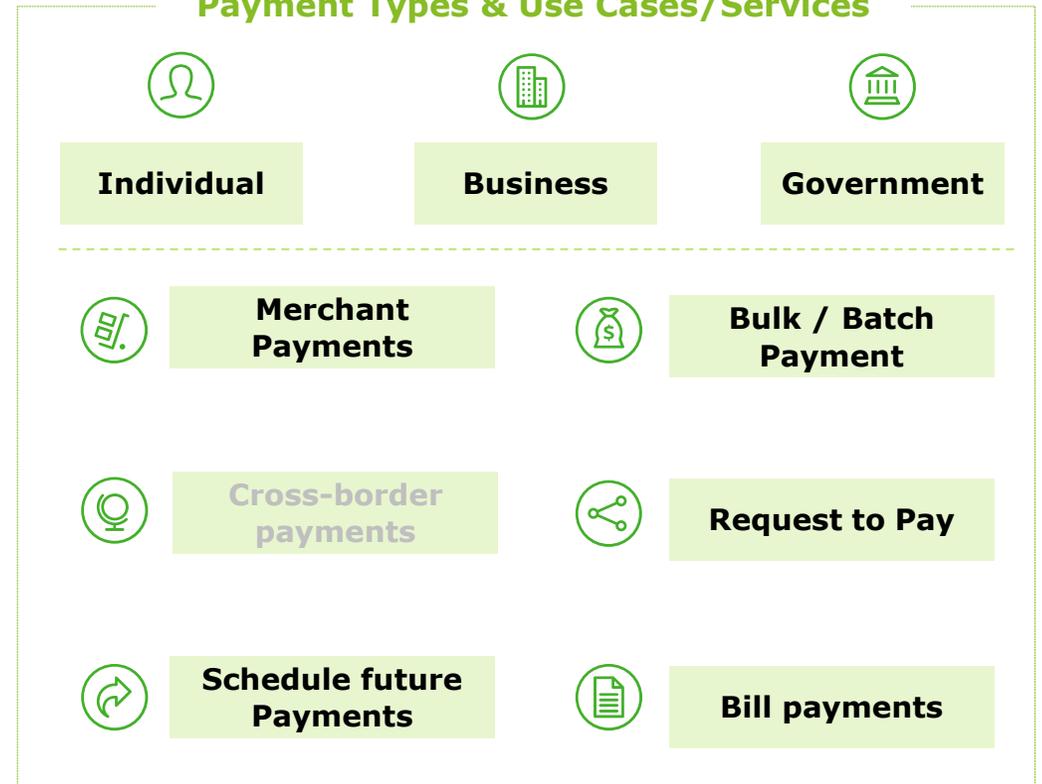
6.1. Key Features

Features

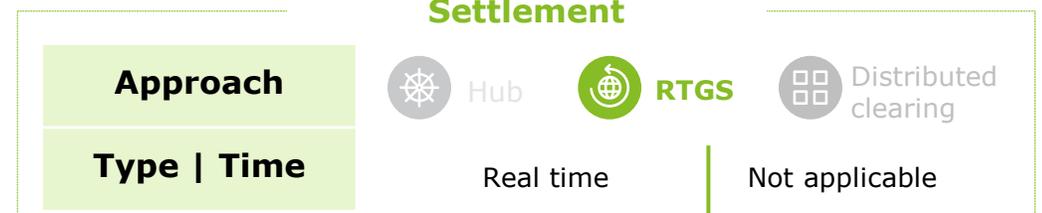
Key Highlights

	Operating hours	<ul style="list-style-type: none"> 24*7 including weekends and bank holidays
	Payment speed	<ul style="list-style-type: none"> Real time*
	Transaction limit	<ul style="list-style-type: none"> FPS imposes no limit Transfer limit also depends on the top up limit of the particular e-wallet
	Alias	<ul style="list-style-type: none"> Mobile Number, E-mail address, FPS identifier
	Channel	<ul style="list-style-type: none"> QR Code, Internet and Mobile channels
	User charges	<ul style="list-style-type: none"> Fund transfer fees is decided by the individual banks & SVFs
	Infrastructure setup	<ul style="list-style-type: none"> Built
	Messaging format	<ul style="list-style-type: none"> ISO 20022
	Use of Open APIs	<ul style="list-style-type: none"> Open APIs available
	Authentication	<ul style="list-style-type: none"> Two factor authentication

Payment Types & Use Cases/Services



Settlement



6.2. HKMA Smart Banking Initiative

In light of rapid technological advancement and its growing impact on the banking industry, the HKMA announced in September 2017 a number of initiatives to prepare Hong Kong to move into a new era of Smart Banking. The initiatives aim to help the banking sector to rise to a higher level and embrace the enormous opportunities brought about by the convergence of banking and technology, thereby improving the quality of banking products and services for customers. As per details provided on the HKMA website, following are the initiatives undertaken

Faster Payment System

- HKMA has launched the Faster Payment System (FPS) which enables their customers to make cross-bank/e-wallet payments easily, by entering the mobile phone number or the email address of the recipient, with funds available to the recipient almost immediately. The FPS operates on 24x7 basis and supports payments in the Hong Kong dollar and the renminbi

Fintech Supervisory Sandbox

- The Fintech Supervisory Sandbox (FSS), launched by the HKMA in September 2016, allows banks and their partnering technology firms (tech firms) to conduct pilot trials of their fintech initiatives involving a limited number of participating customers without the need to achieve full compliance with the HKMA's supervisory requirements.

API Interface framework

HKMA published the Open API Framework for the Hong Kong Banking Sector in 2018. The Framework takes a risk-based principle to implement various Open API functions. It also lays out detailed expectations on how banks should onboard and maintain relationship with TSPs in a manner that ensures consumer protection. The HKMA believes that the Framework will serve as an important guide for the banking industry in Hong Kong to adopt APIs effectively and strike a good balance between innovation and risks.

Cross border cooperation in FinTechs

- HKMA is building collaborative ties with other jurisdictions to strengthen collaboration in FinTechs and to step up global collaboration to ensure a well-functioning financial system

Virtual Banking

- The introduction of virtual banks in Hong Kong is a key pillar supporting Hong Kong's entry into the Smart Banking Era. The HKMA believes that the development of virtual banks will promote fintech and innovation in Hong Kong and offer a new kind of customer experience

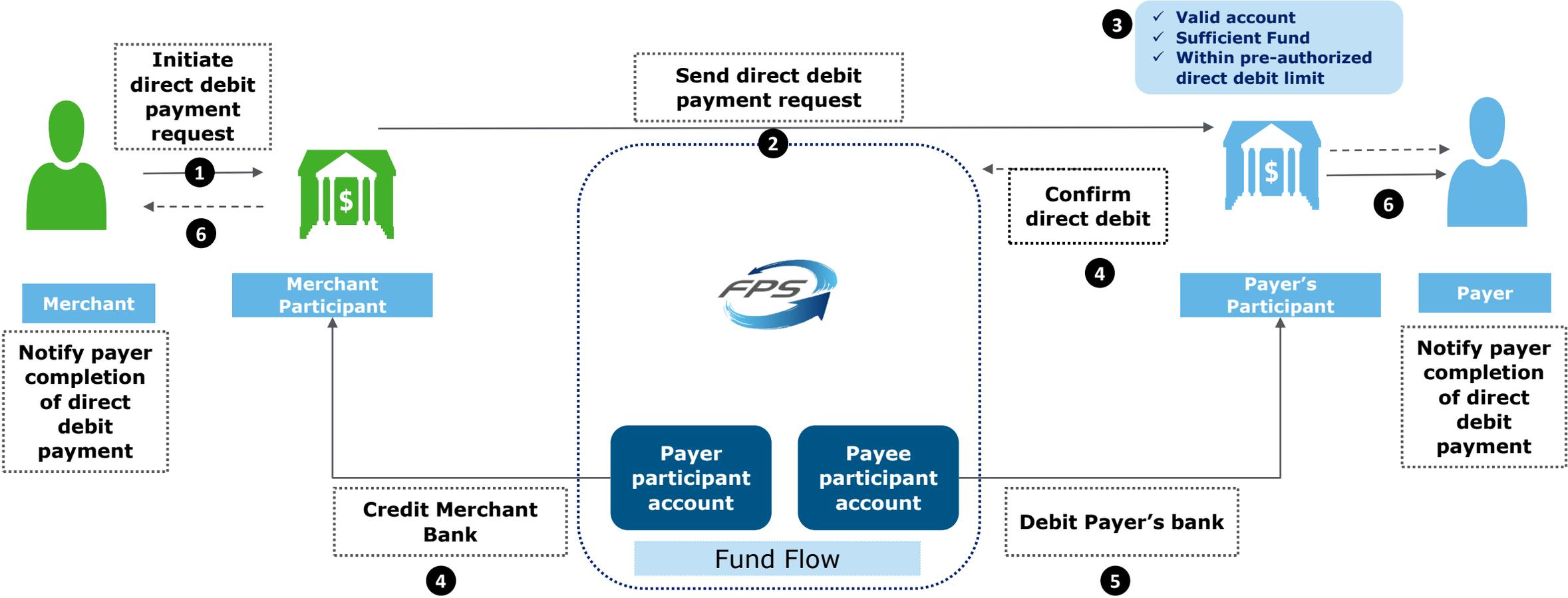
Banking Made Easy Initiative

Banking Made Easy initiative aims at reducing regulatory frictions hindering technological innovations. A Banking Made Easy Task Force has been set up by the HKMA to identify and streamline regulatory requirements so as to enhance customers' experience in the following digital customer journeys in areas like remote customer onboarding and account maintenance, online finance and online wealth management.

6.3. Payment Process | Direct Debit



The FPS allows customers of a participant to authorize direct debit which is also processed real time



Source: HKICL and Primary Interviews