



Development of Near Field Communication (NFC) mobile payment services in Hong Kong

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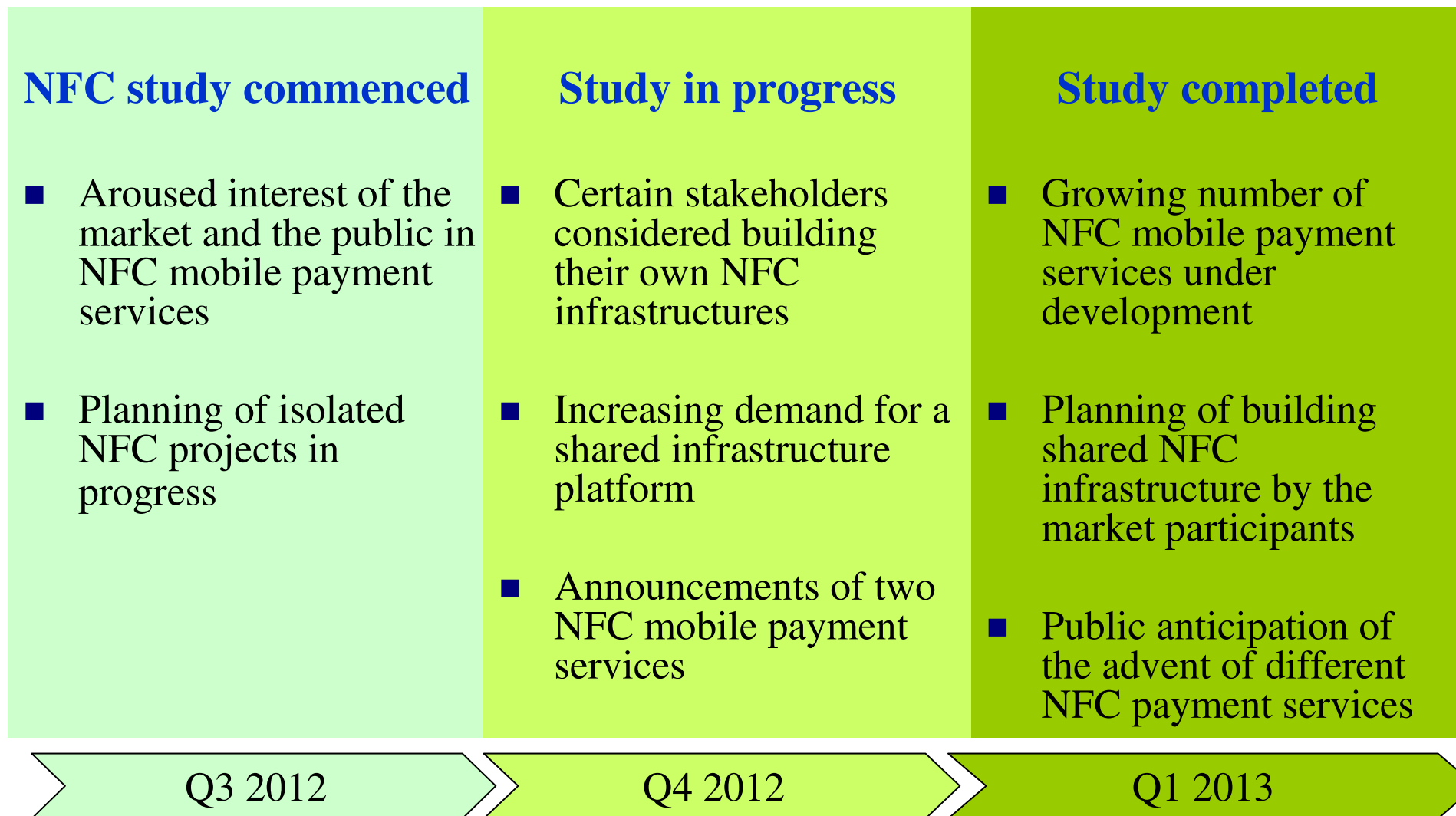
Development strategy of NFC mobile payment services

The HKMA adopts the following strategies in facilitating the development of NFC mobile payment services in Hong Kong:

- Support the development of innovative services
- Establish long-term development objectives
- Support a market-driven approach on infrastructure development
- Develop a set of common standards and guidelines
- Protect users through ongoing supervision of new payment services



Support the development of innovative services





Establish long-term development objectives

The HKMA formulates four long-term development objectives to enable the public to benefit from the innovative services and at the same time to ensure safety and security :

- Ability to download multiple payment services onto a single NFC-enabled phone
- Payment service continuity despite switching from one mobile network operator to another operator
- Payment service continuity despite changing one's NFC-enabled phone
- High level of security in line with international standards and relevant regulatory requirements



Development Objective 1

Ability to download multiple payment services onto a single NFC-enabled phone



Multiple payment cards downloaded onto a single phone



Card A from Bank X



Card B from Bank Y



Card C from Bank Z



Development Objective 2

Payment service continuity despite switching from one mobile network operator to another operator



Payment services are ported to the new network operator



Operator P



Operator Q



Development Objective 3

Payment service continuity despite changing one's NFC-enabled phone





Development Objective 4

Compliance with international security and control requirements in order to prevent:

- Unauthorised access or tampering of transaction data
- Unauthorised usage or leakage of payment card information
- Interruption or disruption of payment services and processing



Consultancy study on NFC mobile payment services

The HKMA appointed a consultant in Q3 2012 to conduct a study on the establishment of an interoperable NFC mobile payment infrastructure

- Collected feedback from the local market
 - 19 stakeholders were interviewed, including banks, payment service providers, mobile network operators, card associations, merchant acquirers and handset manufacturers
- Analysed the approach and development strategies adopted by other markets
- Recommended the implementation strategy for Hong Kong



Hong Kong possesses good market conditions for a market-driven approach

- High acceptance of contactless payments – 85% of non-cash transactions are already contactless
- High smartphone penetration rate – 90% of mobile phones shipped to Hong Kong in 2013 will be smartphones
- Increasing availability of NFC-enabled phones in local market – over 40% of smartphones are expected to be NFC-enabled in 2013



Support a market-driven approach for infrastructure development

- Shared infrastructures are being developed by certain card association to speed up launches of NFC service

- The HKMA supports a market-driven approach for shared infrastructure development as it suits the Hong Kong market:
 - Services can be launched more quickly
 - More receptive to stakeholders

- The HKMA will continue to monitor the market development to ensure accomplishment of the long-term development objectives



Different form factors of NFC devices in the market

- Banks adopt different form factors of NFC devices when launching their mobile payment services
- Shared infrastructures developed by the market participants are able to support various kinds of form factors of NFC devices

Embedded form



Chip embedded in the phone

External device form



E.g iPhone sleeves

Slotted form



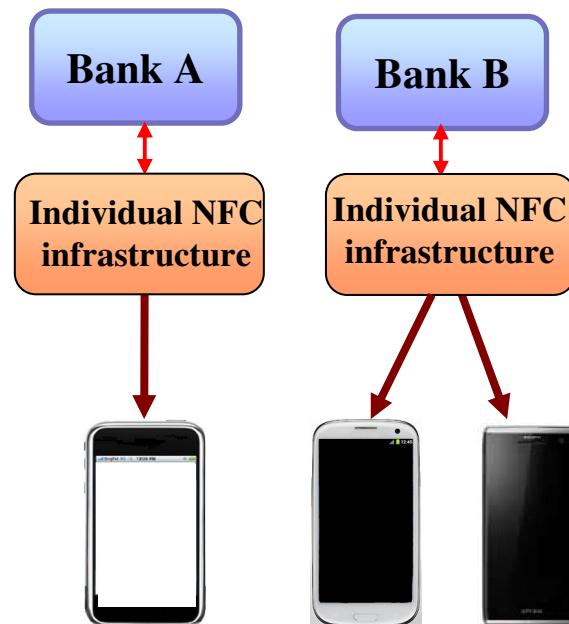
E.g NFC SIM card

- Compliance with the international security and control standards and requirements regardless of the form factors adopted



Market-driven Approach: First Stage

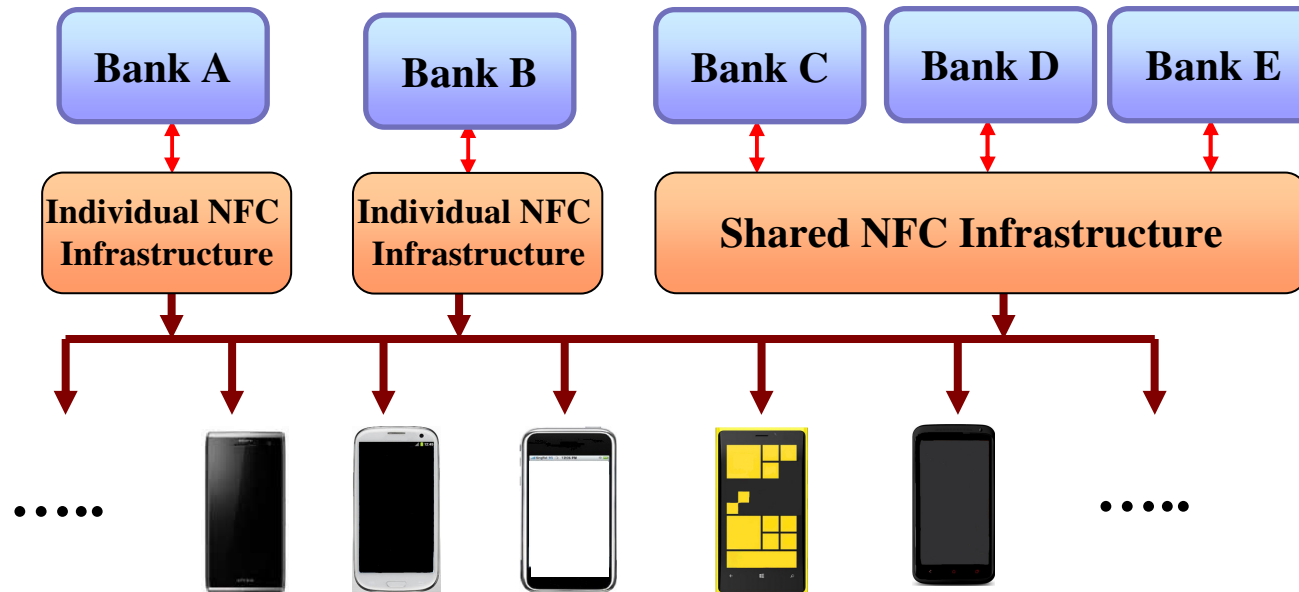
Market focus: time to market through mainly one-to-one partnerships





Market-driven Approach: Second Stage

Market focus: to maximise coverage of a broader customer base through interoperable infrastructures





Development of common standards and guidelines

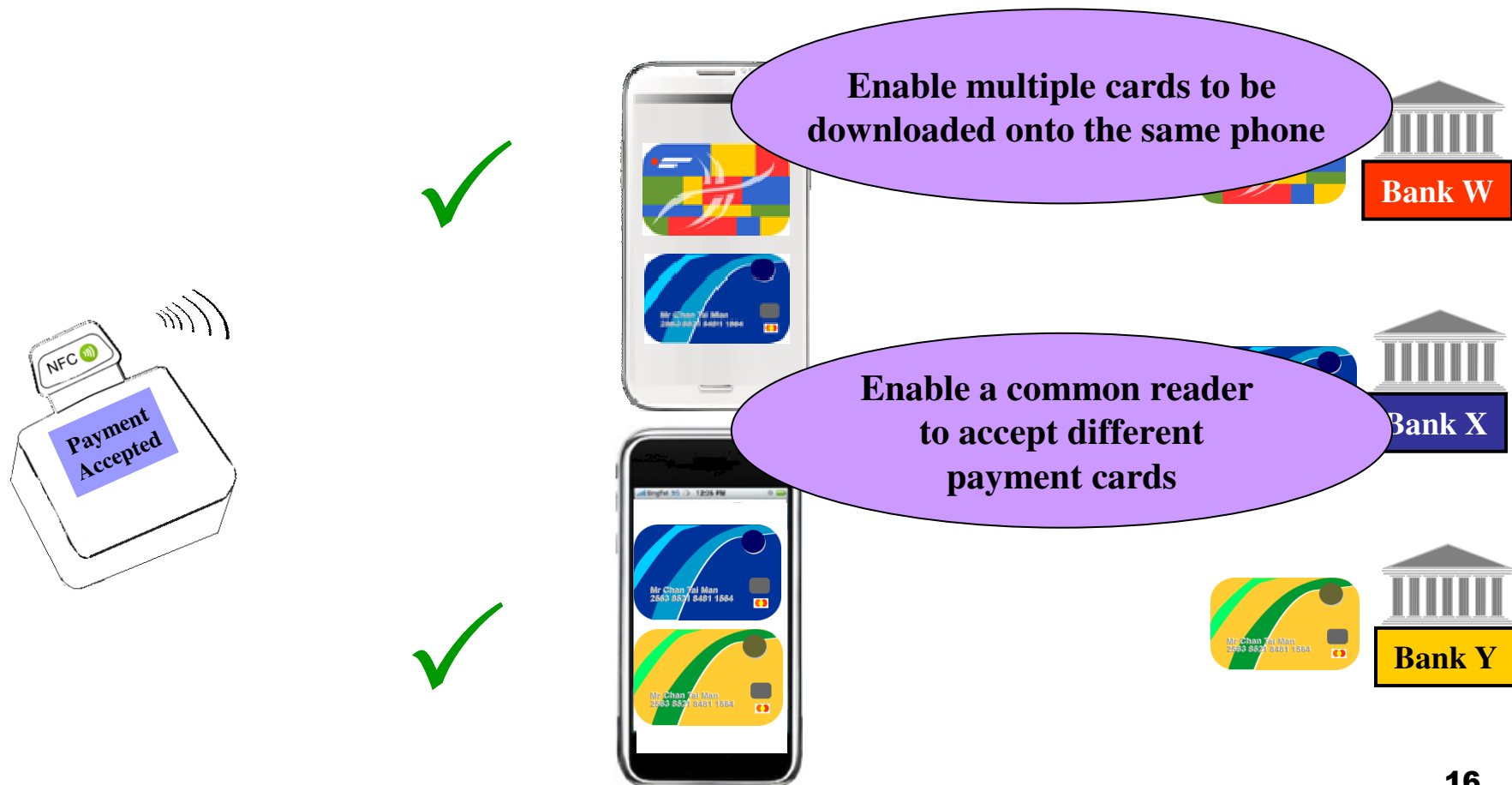
- The HKMA appointed the consultant to develop a draft set of common standards and guidelines based on the international standards
- The HKMA and Hong Kong Association of Banks will establish a working group to discuss and finalise the common standards and guidelines
- The industry supports the proposed approach to attain an interoperable and sustainable environment for the development of NFC mobile payment services



Overview of Guidelines and Standards

A. Technical standards

- Follow the widely adopted industry and international standards to encourage interoperability among the NFC infrastructures, NFC handset devices and point-of-sale terminals





Overview of guidelines and standards (continued)

B. Operational guidelines

- Operational guidelines include the relevant workflows and will offer the following benefits:

Convenient to use

- Service subscriptions
- Service activation
- Service termination
- Service renewal or version upgrade
- Service lock
- Service unlock

Easy to change

- Mobile phone change
- Mobile phone subscription change
- Mobile phone number change

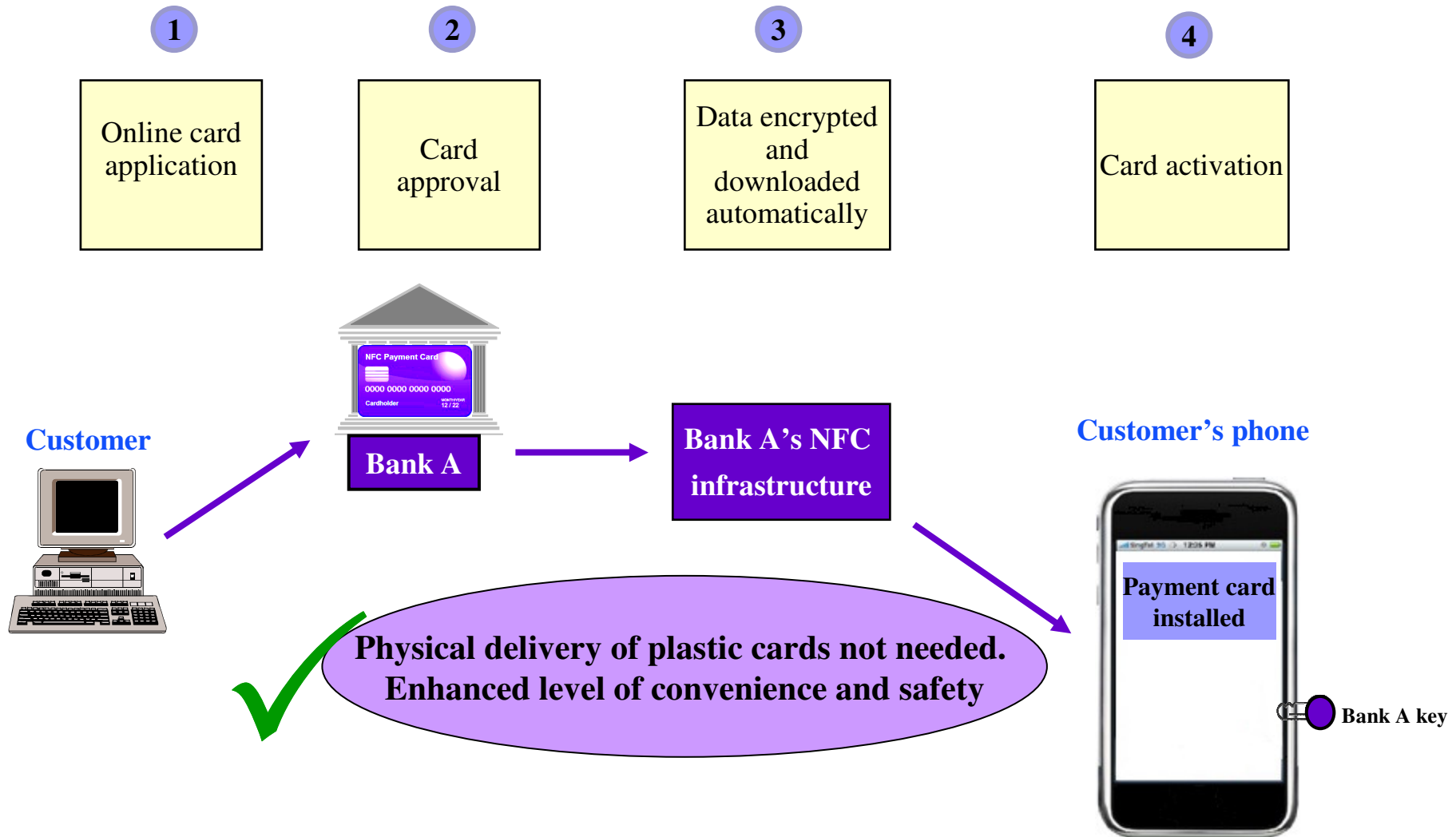
Secure to use

- NFC device loss and replacement
- Mobile phone loss
- Mobile phone recovery
- Mobile PIN change/unblock

- Such workflows also focus on requirements of “know your customer”(KYC), cardholder authentication and mobile PIN management



Example of a payment card application process



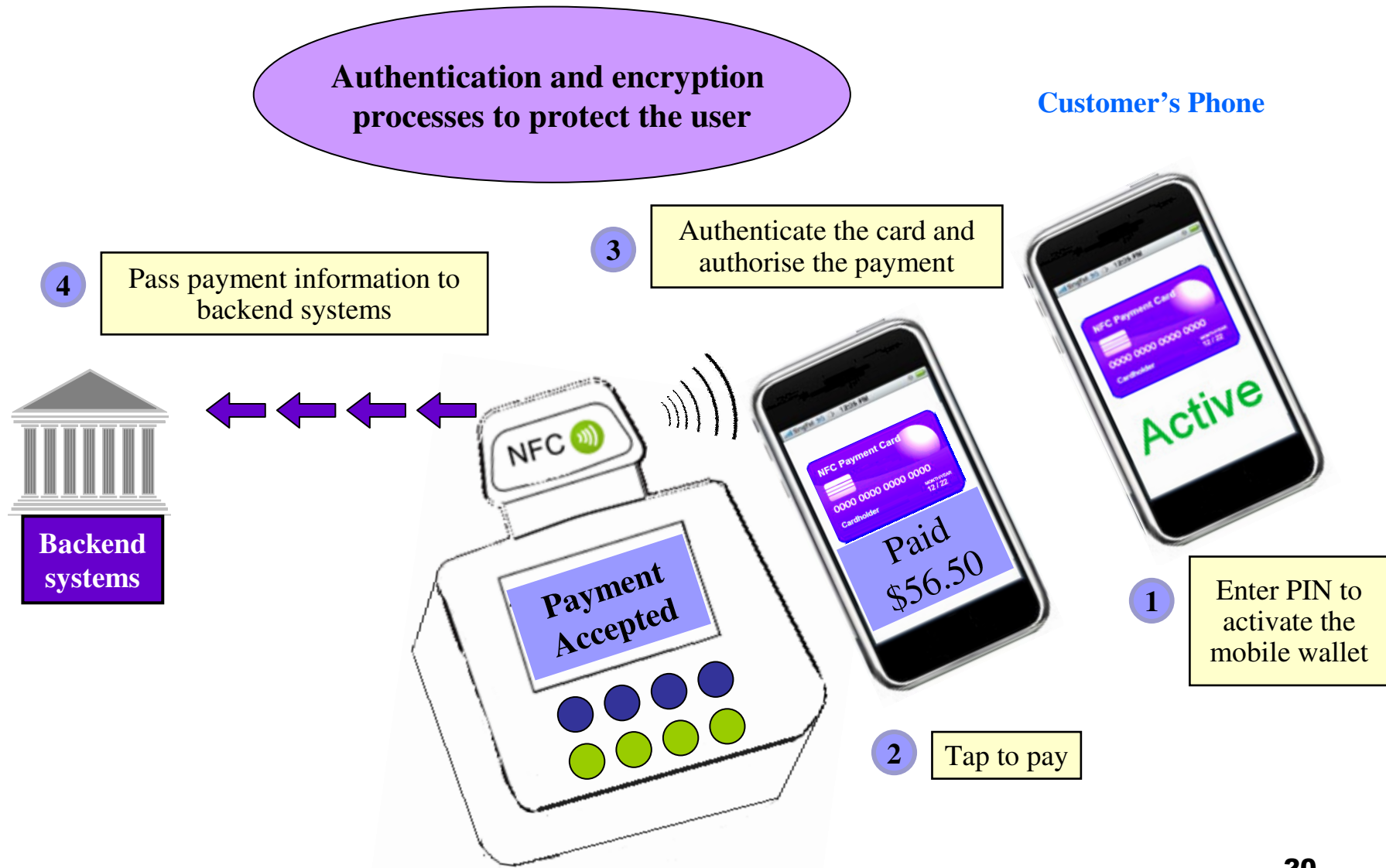


Overview of standards and guidelines (continued)

C. Security measures

| User Concerns | Possible Security Measures |
|---|--|
| Mobile phone hacked and payment card information stolen | Sensitive information of the payment card resides in a tamper-proof NFC device that can not be accessed, modified or copied arbitrarily |
| Mobile wallet accessed and read by others | A personal password can be configured to open the mobile wallet |
| Incorrect transaction amount | User can check the transaction history through the phone |
| Loss of phone | In addition to report of lost phone, the payment card can be locked remotely |
| Data transmission between the phone, reader and back-end systems being hacked | Data transmission process is encrypted to protect the confidentiality (Same level of security as the transmission processes of existing payment cards) |

Example of a credit card payment transaction process





Benefits of adopting common standards and guidelines

- Enjoy multiple services on a single phone
- Increase user confidence
- Enhance user experience and reduce learning curve if similar operational workflows are adopted across different banks
- Promote acceptance of NFC mobile payment services



Protect users through ongoing supervision

To launch a new service

- The HKMA requires banks to conduct the following procedures before launching a new service:
 - Communicate and discuss the plan with the HKMA;
 - Conduct an independent assessment and submit the assessment report for the HKMA's review
 - Provide additional information at the request of the HKMA, if necessary

On-going supervision

- On-going compliance with relevant supervisory requirements by banks is necessary (e.g. internal control system, data protection, application security, etc)
- The HKMA will ensure banks' compliance with the supervisory requirements through on-site examinations and off-site reviews



Conclusion

The HKMA continues to support the rapid development of the market:

- Rapid change of the market landscape within 6 months from generally low market awareness to launching or preparing for launching of NFC mobile payment services by many banks
- Proactively exploring different development strategies and planning of building shared infrastructure by the industry in order to accomplish the HKMA's long-term development objectives
- Through the establishment of an industry working group under HKAB to implement the common standards and guidelines by the second half of 2013