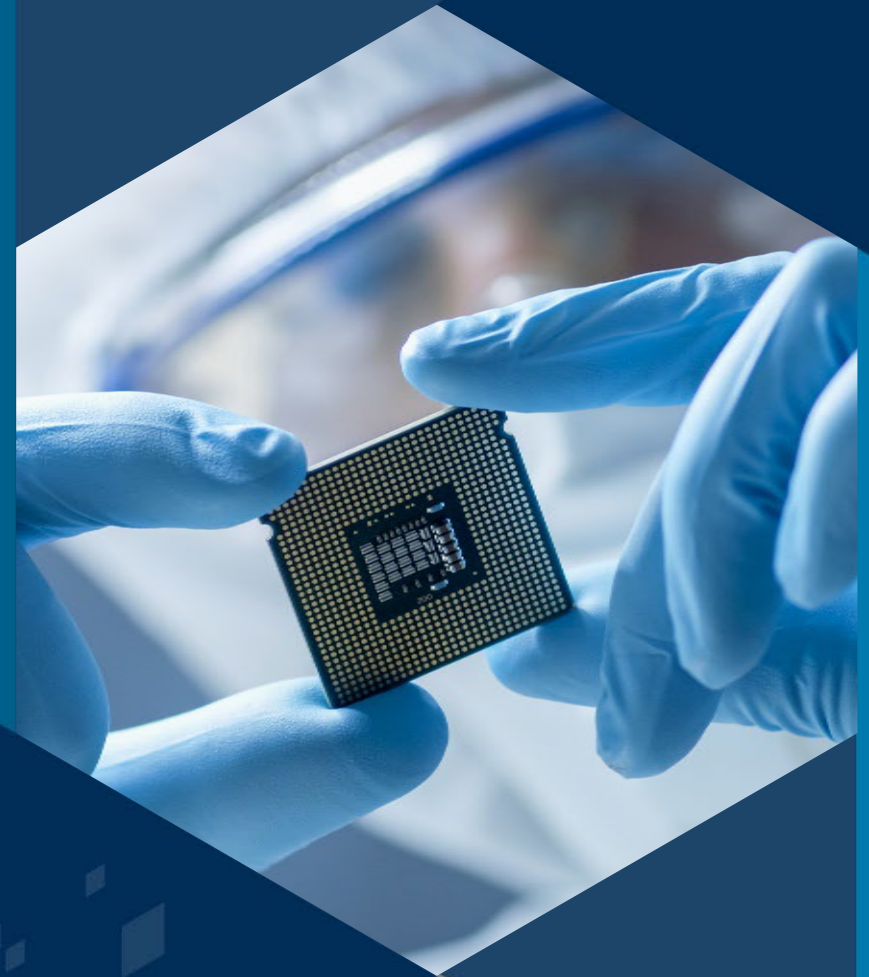


# Next Generation Identity Proofing in HKUST



# Today's outline

- Project Background
- Recent Development
- Recommendations
- Management Direction
- Success Criteria
- Tentative Schedule
- Project Implementation
- Insights and Recommendations for Strategic Planning

# Project Background (1/2)

- The existing HKUST Card (科大咭) has been in used for over 20+ years, based on Java Card Technology developed in 1996.
- The necessity to store highly sensitive information on the HKUST Card, which is one of the main reason the more costly Java Card technology is adopted, is now deemed unnecessary since the obsoletion of HKUST e-Purse in 2023.
- At the same time, there are other new technologies in the market offering similar cryptographic capabilities and security features while leveraging newer technologies, and most importantly, at lower cost.



# Project Background (2/2)

- In or around 2019-2020, ITSC was tasked by senior management to conduct a comprehensive review of the overall strategy for physical identification and technical alternatives, and subsequently provide a recommendation for the appropriate course of action to be taken. The recommendations should cover the following area:
  - The standards for short-range contactless communications in HKUST, including:
    - ❖ Contactless smart card technology
    - ❖ Communication protocol between reader and tag / card
    - ❖ Operating frequency and range
    - ❖ Data encoding and format
    - ❖ Encryption method
  - To ascertain the appropriate University-wide identification proofing method to be adopted in HKUST

# Recent Development

- In mid of 2023, HKUST was informed by the current HKUST Card provider indicating the forthcoming retirement of the existing version of Java card by the end of 2023. Subsequently, an upgraded version of Java card will be provided starting 2024.
- Although the current inventory of HKUST Cards will adequately cater to the demand for card issuance in 2024, it is imperative to secure an alternative source of HKUST Cards prior to the depletion of existing inventory.
- Taking advantage of the situation, ITSC recommended senior management to expedite the previous timeline of migrating from Java card to capitalize on the momentum.

# Recommendations

- After thorough technical / operation review, the ITSC is recommending the follow standards for short-range contactless communications:
  - ❖ Contactless smart card technology: **Mifare DESFire EV3**
  - ❖ Communication protocol: **Near Field Communication (NFC) on ISO/IEC 14443**
  - ❖ Operating frequency and range: **13.56 MHz**
  - ❖ Data encoding, format: **UTF-8, format to be further defined**
  - ❖ Encryption method: **Advanced Encryption Standards (AES)**
- For identification proofing method:
  - ❖ While the prevailing trend among organizations is shifting towards the migration from physical to digital identity, HKUST acknowledges the significance of physical identification and **will continue to issue physical HKUST Card** as a tangible token of identification.
  - ❖ Simultaneously, HKUST is also **launching digital identity (i.e. HKUST e-Identity)** **as an alternative** means of identification, thus paving the way for future advancements in this realm.

# New HKUST Card



- Embedded NFC chip on the smart card for contactless communication exclusively.
- The information currently **stored in the NFC** will remain intact in initial phase, pending for software enhancements to eventually eliminate the necessity of retrieving information from the card.

	Existing HKUST Card	New HKUST Card
1	Personal PIN	To be remove and retrieved from backend
2	Card Expiry Date	To be remove and retrieved from backend
3	Card owner name	To be retained
4	Student / Staff ID	To be retained
5	Card serial no.	To be retained

# Success Criteria

1. Achieve overall cost reductions in the operational aspects of the new HKUST Card.
2. Facilitate the operational needs of new HKUST Card management, in particular the issuance process for students and staff members.
3. Enabling the provision of vital services to students and staff via new HKUST Card.
4. Provided it aligns with the project schedule and technical feasibility, accommodate the inclusion of HKUST e-Identity within the new card reader system as far as possible.

- Facilitate the operational needs of new HKUST Card management, in particular the issuance process for students and staff members.

	System / Process	Dept.	Action
1	Define new technical standards	ITSC	- Define the required standards - Implement related backend services
2	HKUST Card Management System	ISO	- Modify card activation / update module - Modify card printing module
3	Issuing HKUST Card for Students	ARO	- No change
4	Issuing HKUST Card for Staff	HRO	- No change

➤ Enabling the provision of **vital services** to students and staff via new HKUST Card, and HKUST QR code if feasible

	System / Process	Dept.	Action
1	Physical Access Control (SDACS)	ITSC	1.1 Fine tuning for new HKUST Card 1.2 Already support HKUST QR code
2	Network Printers	ITSC	2.1 Enable support of new HKUST Card and / or QR Code
3	Staff Attendance Taking System	ISO	3.1 Enable support of new HKUST Card and / or QR Code
4	Facility Access	DSTO	4.1 Enabling existing physical access control devices to support new HKUST Card and / or QR code at: 4.1.1 - Sports Hall 4.1.2 - Swimming Pool 4.1.3 - Student dormitory 4.2 Enhancement in Attendance Taking System
5	Staff Quarter Entrance	CMO	5.1 Enable support of new HKUST Card and / or QR code
6	Shuttle Bus Service	CSO	6.1 Enable support of new HKUST and / or QR code
7	Library Services	LIB	7.1 Enabling entrance gate to support new HKUST Card and / or QR code
8	Physical Access Control (Non SDACS)	Various Dept	8.1 Enabling support of new HKUST Card and / or QR code
9	Alumni App	DAO	9.1 Adopt HKUST QR Code 9.2 Enabling entrance fate scanner to support new HKUST QR code

# Tentative Schedule (1 of 2)

	Tasks	Duration	Calendar Month
1	Impact Analysis	2 month	Apr 2024 – May 2024
2	Resource Estimation	1 month	Jun 2024
3	Funding Application	1 month	Jul 2024
4	Procurement and Tendering	1 month	Aug 2024
5	Change Implementation	3 months	Sep 2024 – Nov 2024
6	Testing	1 month	Dec 2024
7	Service Launch	-	Dec 2024

## Tentative Schedule (2 of 2)

1. Replacement / upgrade of card readers for vital services should be completed on or before Dec 2024.
2. Replaced / upgraded card readers should support both existing and new HKUST Cards
3. No one-off exercise would be conducted to replace all existing HKUST Cards, instead, new cards to be released on or after Jan 2025 would be adopting the new HKUST Cards standards.

# Project Implementation

1. Overall project management / progress monitoring by ITSC
2. Representative from individual department to manage their corresponding change(s)
3. Regular meeting to report and review progress
4. ITSC will be responsible to report the regular progress to senior management regarding the readiness of issuing new HKUST Cards

# Insights and recommendations for strategic planning

1. When developing your strategy, please be reminded that the process of replacing the new HKUST Card will inevitably involve a transitional period in majority of cases, during which both the existing and new HKUST Cards will be utilized concurrently.
2. Minimize changes and maintain a concentrated focus on the objectives to be accomplished.
3. Formulate contingency plans / workaround in the event that complete replacement or implementation is deemed impractical or unattainable.
4. Leverage established standards, designs, and hardware that have demonstrated their effectiveness.