The Mobile Revolution

Identification, access and micropayment with NFC

Carlos Paternain
May, 2013

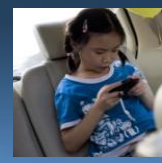| Automotive	Identification	Wireless Infrastructure	Lighting	Industrial	Mobile	Consumer	Computing

‣ **Global player with local reach**
  – 2012 revenue >$4.36 Billion
  – >25,000 employees

‣ **Identification Business Unit**
  – Secure Passports, Banking, Mobile Transactions/NFC,
  – Transport, Infrastructure/Reader IC's, RFID (LF, HF, NFC, UHF)

We bring Security & Convenience
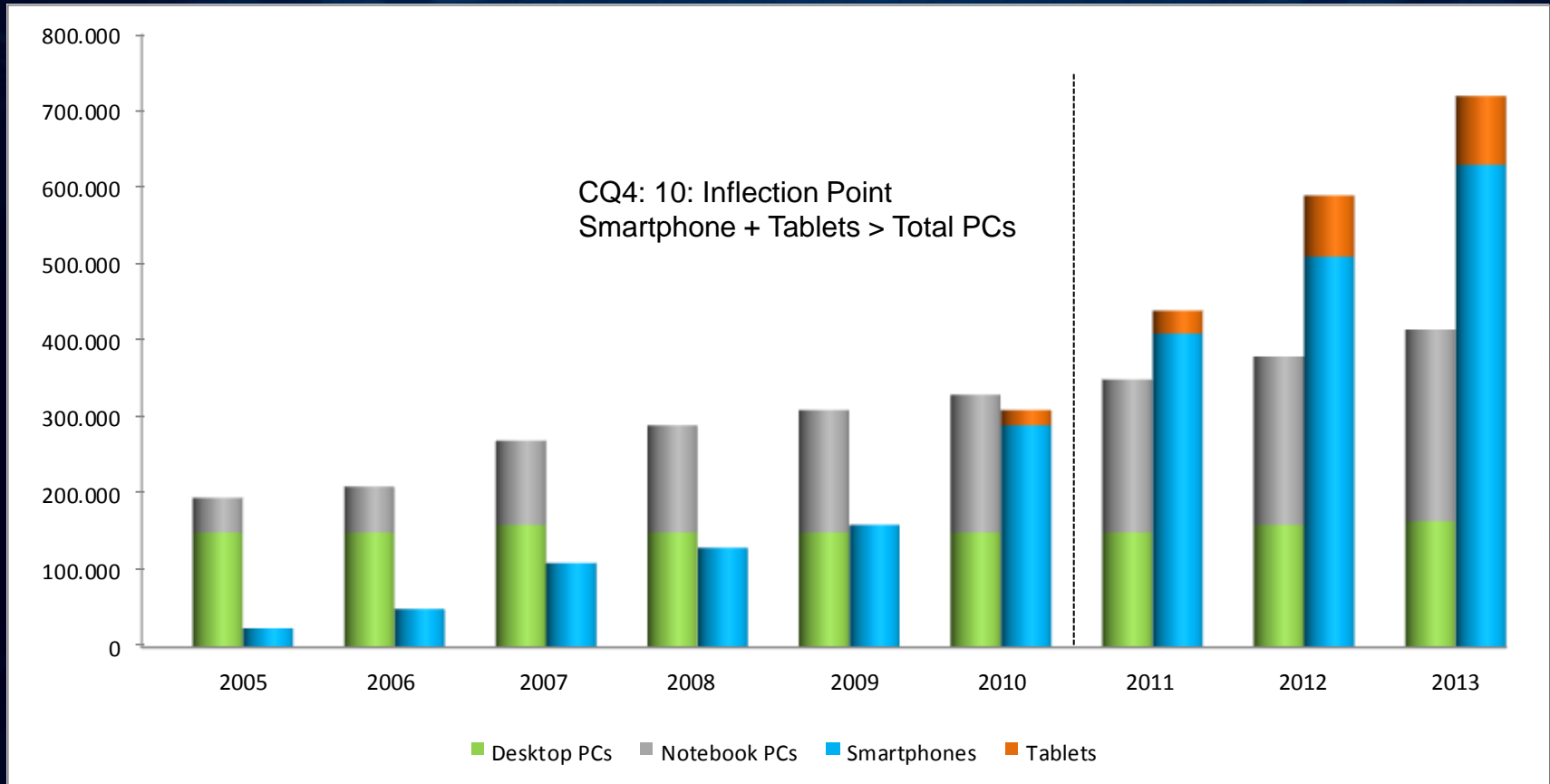
NXP is #1 with over **8B** **units shipped**

VIDEO

Smartphones revolutionize mobile

Global Unit Shipments (MM)

CQ4: 10: Inflection Point
Smartphone + Tablets > Total PCs

Legend: ■ Desktop PCs ■ Notebook PCs ■ Smartphones ■ Tablets

Source: Morgan Stanley Research

Benefits of NFC technology on campus cards

For students

‣ Use you smartphone just like your student cards.

‣ One device less to carry (or to forget).

‣ Higher convenience as students embrace technology

‣ Easier interaction with the application (screen)

‣ Added value on top of application (connectivity)

For Campus management

‣ The technology supports over-the-air provisioning and management of digital keys, which simplifies access control administration.

‣ Lost phones carrying digital keys are more likely to be noticed and reported than physical keys or ID cards.

‣ Higher security due lowering the risk of key and/or card copying

‣ No need to replace current contactless infrastructure
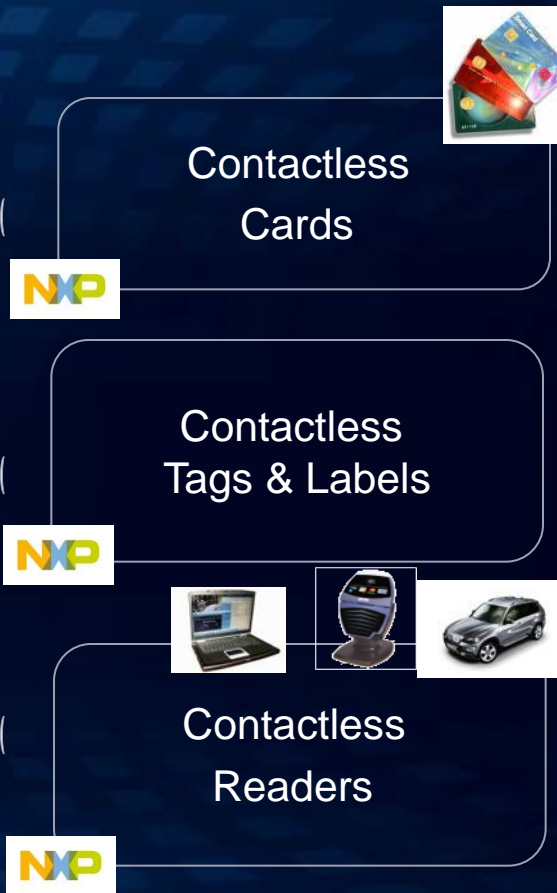
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NFC enables a new mobile experience

Card Emulation

Read / Write

Peer 2 Peer

Contactless Cards

Contactless Tags & Labels

Contactless Readers

NFC IC
NFC Host SW
JavaCard OS
Security Controller
MIFARE4Mobile API

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NFC Market update

- **NXP: 125m NFC devices sold in 2012**
  - 2012 has been a year of change for NFC
  - From selective/limited adoption to massive adoption
  - Analysts predict 280m for 2013

- **NFC attach rate > 50% in 2015**
  - High Adoption on high-end & flagship models
  - Now reaching mid-range and going to low-end smartphones

- **180 NFC phones & tablets models commercially released**
  - up to 250 including the design-in pipe
  - NXP NFC technology

- **> 70% NFC+eSE:**
  - Embedded Secure Element enables new value creation opportunities
  - Secure Transactions: Payment, Transit, Access, Authentication,…

- **9 out of 10 top NFC smartphone manufacturers rely on NXP**

- **2013 should be the year of applications**
  - we shall see many mobile wallet rollouts
  - application developers and service providers will leverage this
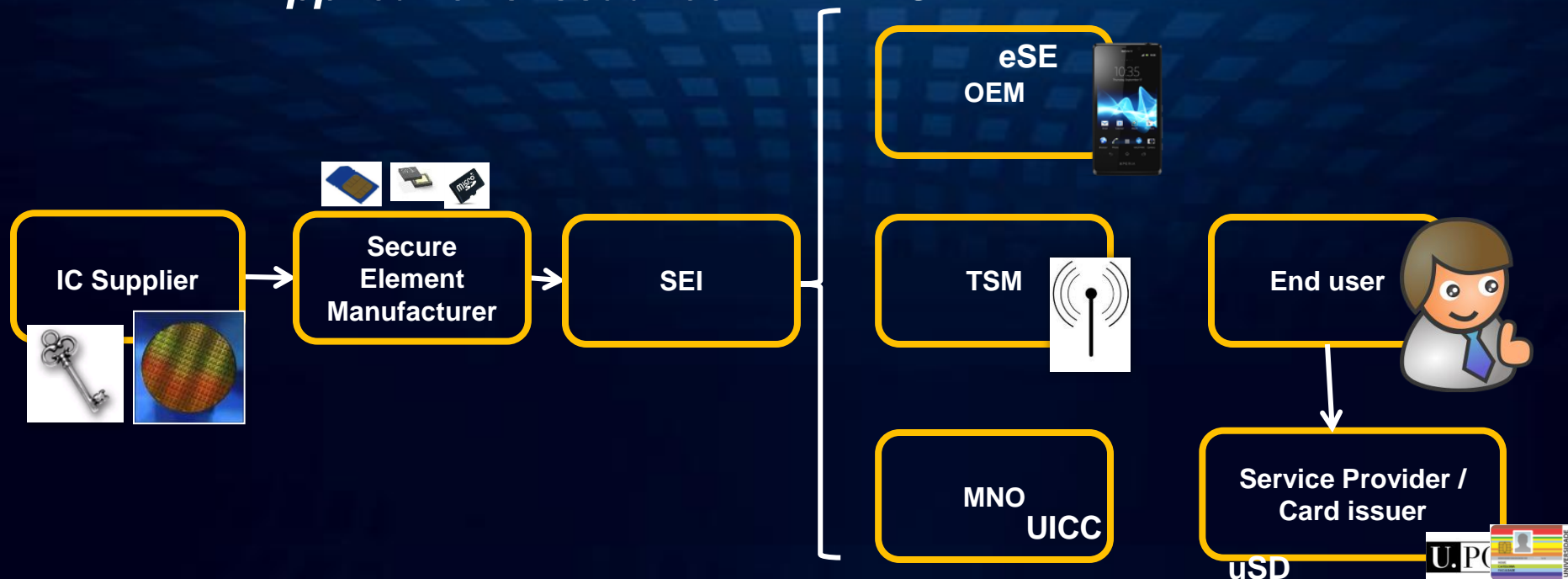 - OEMs will increasingly design NFC into laptops and accessories such as headsets, speakers
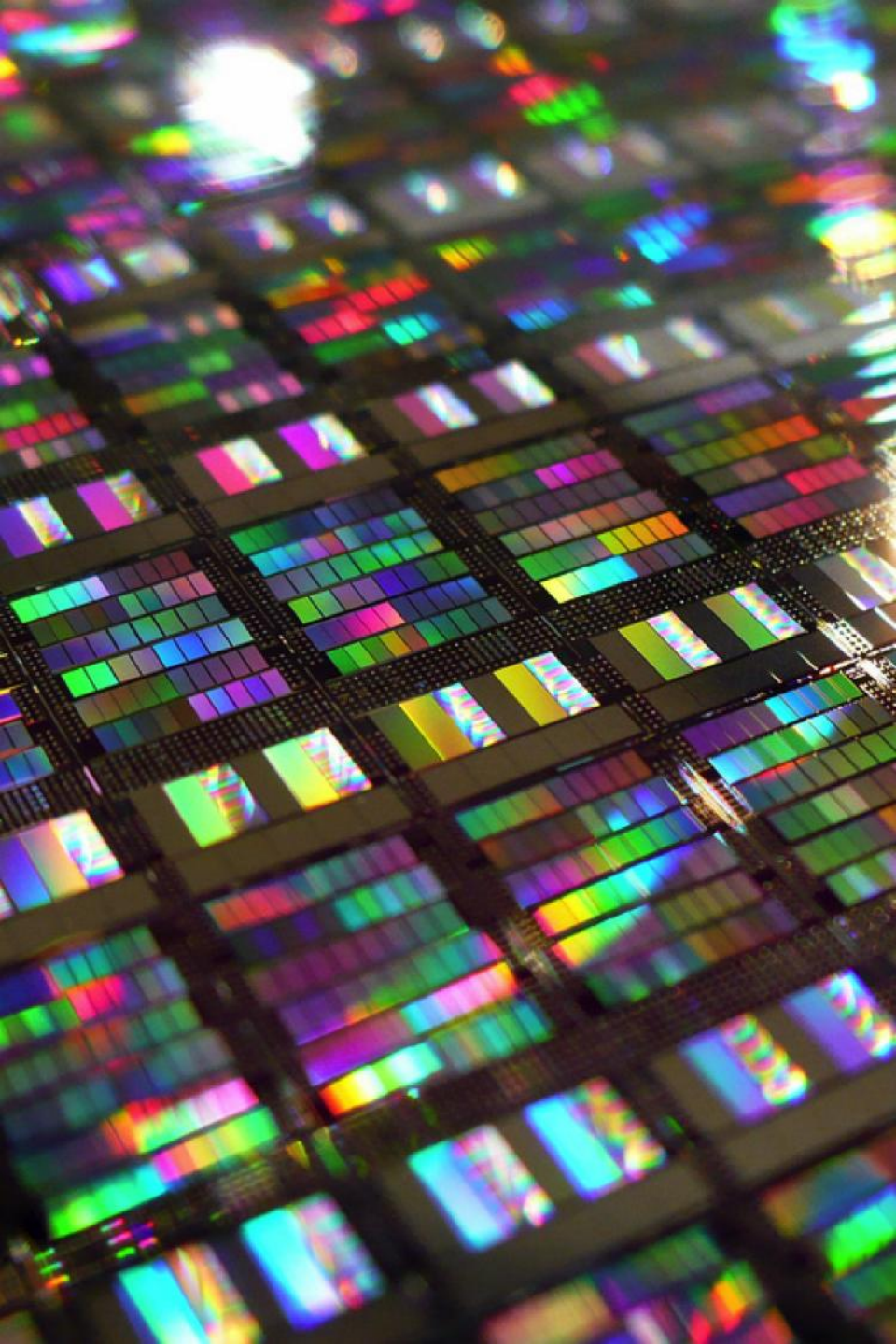
MIFARE In Mobile

NFC Ecosystem
MIFARE Applications issuance with NFC

- ▸ Service provider needs to load the MIFARE application into the SE

- ▸ **Keys** to acces the SE are in **possesion of the SEI**

- ▸ **Phone with SE** is in **possesion of the end user**

- ▸ **Product and security follow different paths!**

- ▸ New players modifying the established business model of contactless

NFC SE form factors and implications

- Availability: globally, multiple OEMs integrated
- Associated to specific device
- Ownership = OEM

- Availability: local markets (MNO decision to roll out)
- easy SIM swap – NFC mobile required
- Ownership = MNO

- Availability: local markets (Retail)
- Easy fit into most phone models (no NFC required)
- Relatively high price
- Ownership = SP/CUSTOMER*

*in case of rental model – owner = rental company

Licensing activities to ensure availability of MIFARE™

‣ MIFARE is the **open architecture platform** for secure and flexible end-to-end system solutions.

‣ All leading **manufacturers of SIM** cards and **embedded secure elements** have acquired a **MIFARE™ license.**

‣ MIFARE license agreements with **Renesas** and **STMicroelectronics** assure multi vendor supply for banking applications.

‣ Leading **infrastructure providers** such as **HID** and **LEGIC are licensees of NXP's MIFARE** technology**.**

‣ **UL** providing functional **testing and certication**

What is MIFARE4Mobile?

MIFARE4Mobile is…..

a set of specifications for SE (embedded, UICC SIM, microSD) with capabilities

- – for OTA **installation**, **operation** and **revocation** of MIFARE products (**TSM API**)
- – to **manage** the application lifecycle of MIFARE applications in a mobile handset (**Service Manager**)
- – for **displaying** MIFARE content on the handset screen (**Wallet API**)

Specifications are licensed **free of charge** to anyone who wishes to implement MIFARE4Mobile applet on a SE and **agreeing to the terms & conditions** (Robustness, security, self certification, Non-assert of IPR,..)

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Vilanova University - Wildcard

‣ Wildcard is MIFARE Classic based
  – Currently used for: laundry, vending, copies, sporting events, acces control

‣ Using iPhone sleeves from Wireless dynamics
  – Supporting MIFARE Classic

‣ 54 participants (22 staff members)
  – Pilot included dorm acces

‣ Extending the use of phones by students

‣ 70% of the participants prefered to use their phone instead of the badge
  – No need to change infrastructure for university
  – Participants requested more services!

University of San Francisco – One Card

‣ Following Vilanova pilot

‣ Once card USF based in MIFARE Classic

‣ Using iPhones sleeves fom Wireless dynamics
  – Supporting MIFARE Classic

‣ Applications on NFC pilot included
  – Access control
  – Payment at laundry terminals

‣ Convenience and security with NFC
  – Using phones instead of badges
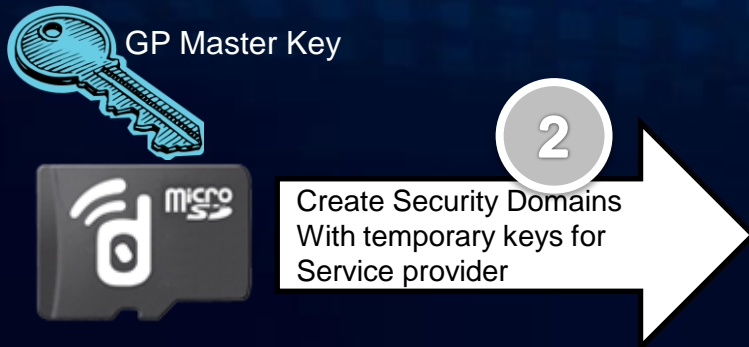 – Credentials equally protected as in badges

uSD use case

‣ uSD from Device Fidelity

‣ Enables any phone with uSD slot to act in Card Emulation mode

‣ Supporting
  – MIFARE Classic implementation
  – MIFARE4Mobile ready
  – Banking applications

‣ Additional memory for user storage

‣ University in full control of the SE
  – Allows new revenue streams by allowing external services on SE

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1 Initial investment
Purchasing of uSD

GP Master Key

uSD Memory part 4GB
Offline Map, discounts
+ all University Apps

GP Master Key

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2 Create Security Domains
With temporary keys for
Service provider

SD pre-paid
Visa payWave))

SD campus card
U.PORTO

SD transport card

Temp SD Key pre-paid

Temp SD Key campus card

Temp SD Key transport

3 Each service provider
Perso keys SD
Perso data e.g.MIFARE keys
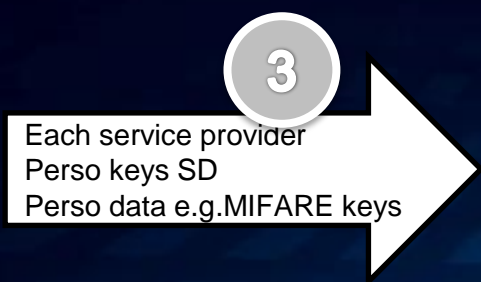
BANK

New secret + **perso** *Visa payWave*))

U.PORTO New secret + **perso** U.PORTO

New secret + **perso**

COMPANY CONFIDENTIAL

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Conclusions

NFC technology provides numerous advantages for campus card applications.

Fun for students & **innovative services opportunities** for campusses.

The **MIFARE platform** used for traditional cards can be leveraged into the mobile space.

Start with a proof of concept and make use of the engineering knowledge in the campusses.

UNIVERSITY

SAMSUNG

12:03
Thu. 3 May

swipe screen to unlock

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Thank you very much.

We appreciate your feedback.

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