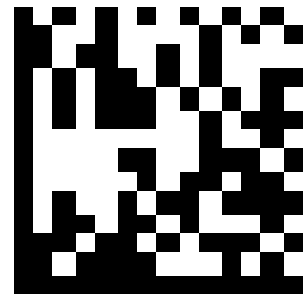


Near Field Communication (NFC) for Mobile Applications in Asia

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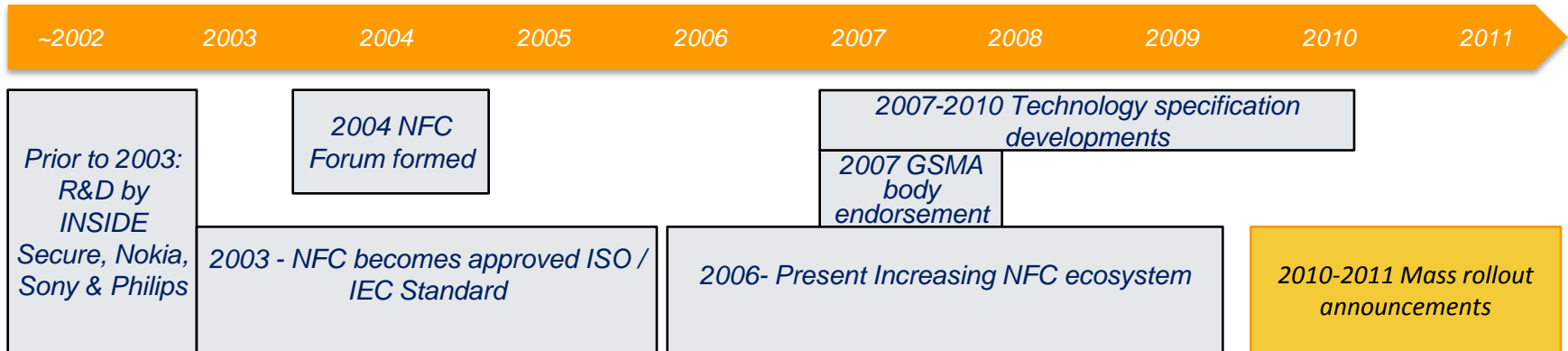
contact

NFC - Bridging the Physical and the Virtual Worlds

Agenda

- NFC History, evolution, and key players
- NFC technologies
- NFC Applications
- NFC in Asia
- Myths, Hypes and Facts
- Resources for NFC
- Q & A

NFC Evolution



The NFC Forum

- Established in 2004
- Currently has >140 members across the NFC ecosystem
- Encourages and promotes development of products using NFC Forum specifications
- Develops standards-based NFC specifications and interoperability parameters

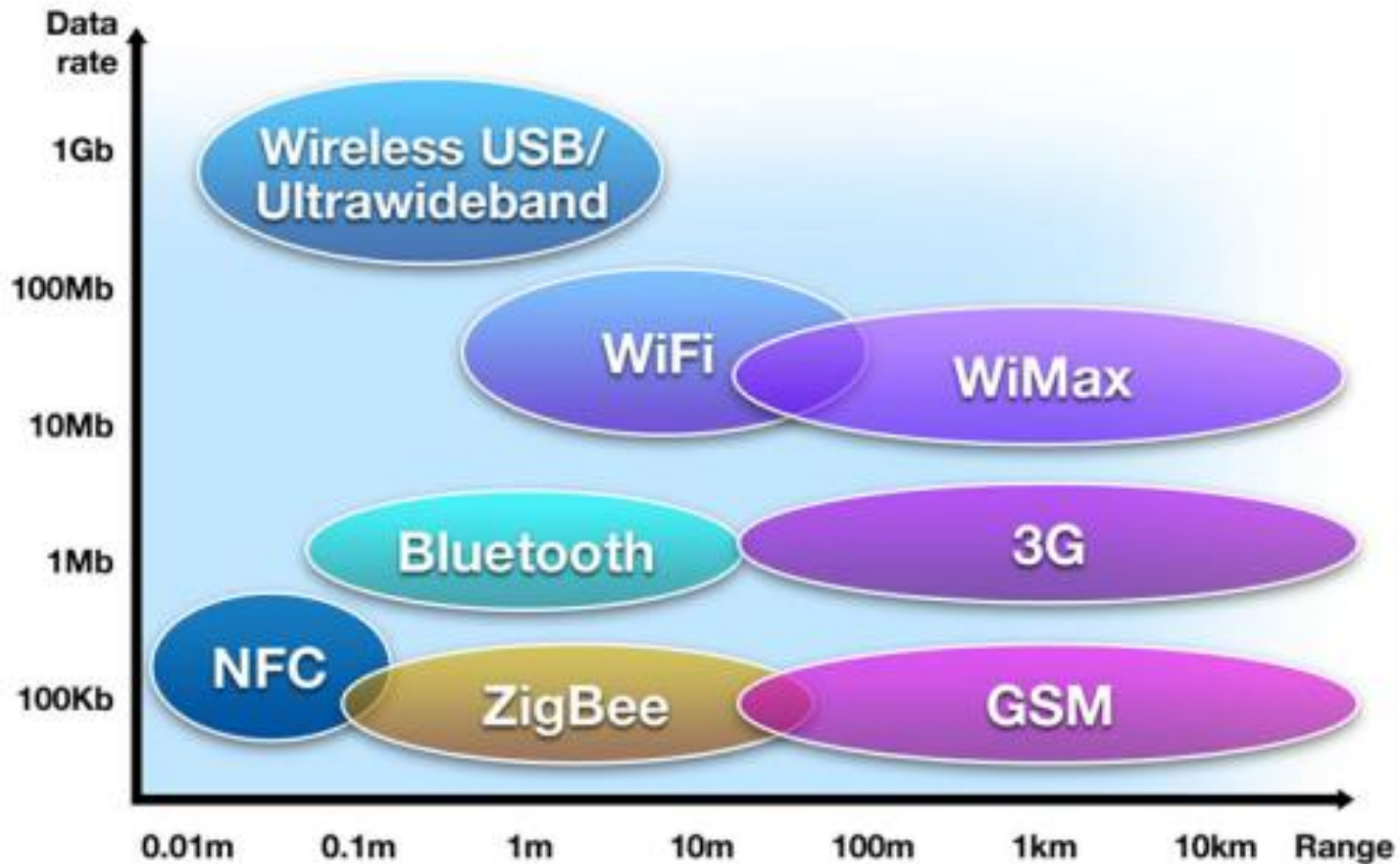


History of Mobile Commerce

In 1997, first two mobile phone enabled Coca Cola vending machines were installed in Finland. Payment was made by SMS text message



Wireless Technologies

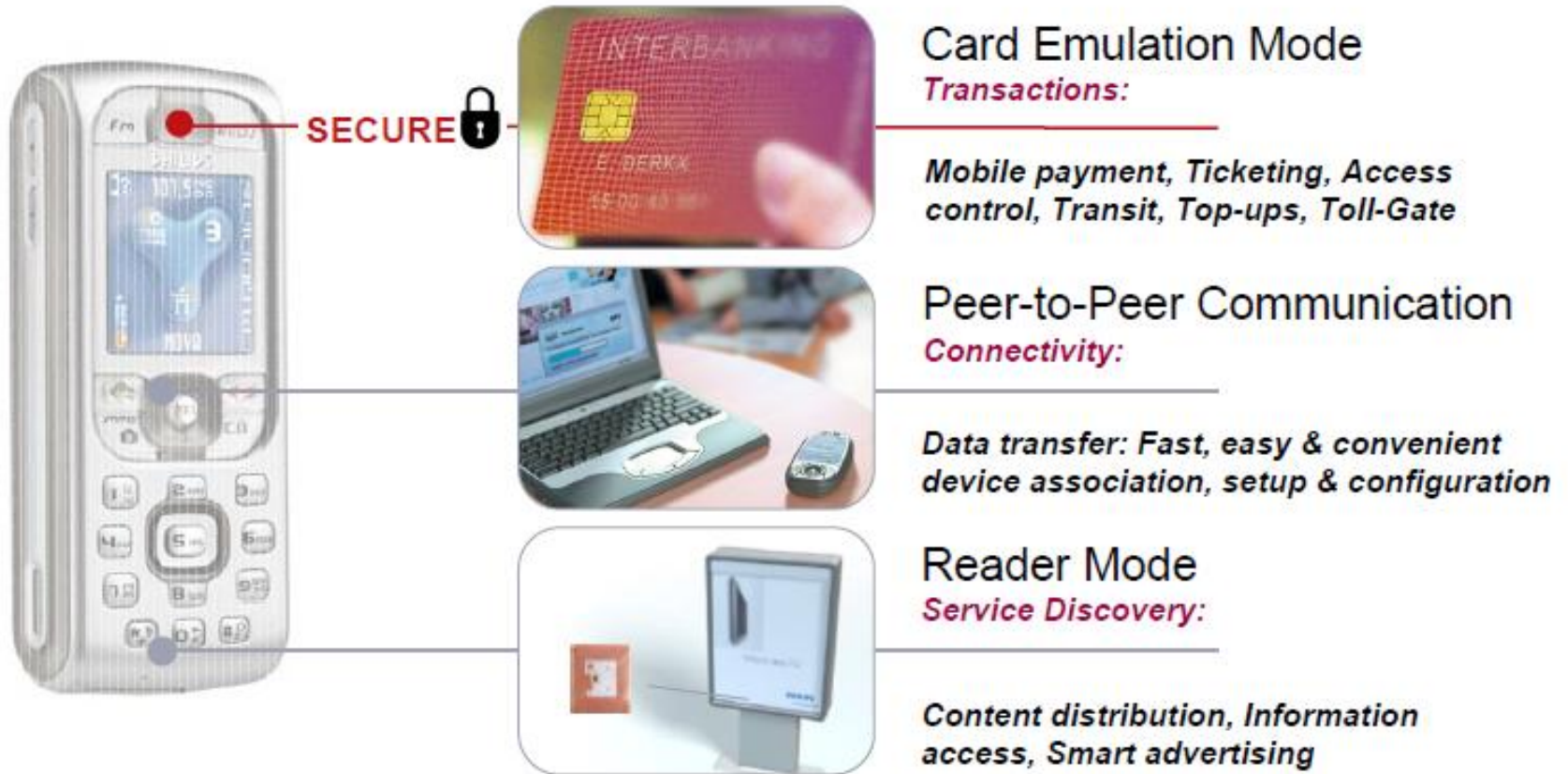


NFC Specifications

Wireless Short Range Communication Technology

- Based on RFID technology operates at 13.56 MHz
- Operating distance typical up to 10 cm
- Data exchange rate of 106, 212, 424 or 848 kbit/s
- ISO/IEC 18092 for Interface and Protocol
- ISO 14443-A and 14443-B for transit and proximity
- ISO 15693 for extending the distance of ISO 14443

NFC: Three Modes of Operation



NFC Communications

Passive Communication Mode:

- The Initiator device provides a carrier field and the target device answers by modulating the existing field. In this mode, the Target device may draw its operating power from the Initiator-provided electromagnetic field, thus making the Target device a transponder.



POS as the Initiator



NFC phone as the Initiator

NFC Communications

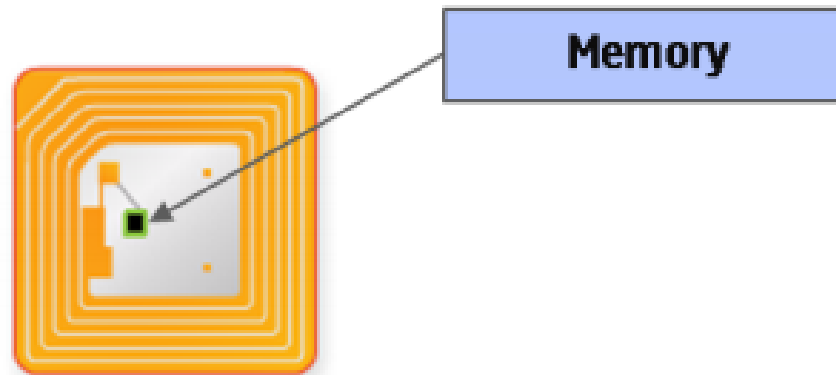
Active Communication Mode:

- Both Initiator and Target device communicate by alternately generating their own fields. A device deactivates its RF field while it is waiting for data. In this mode, both devices typically have power supplies.



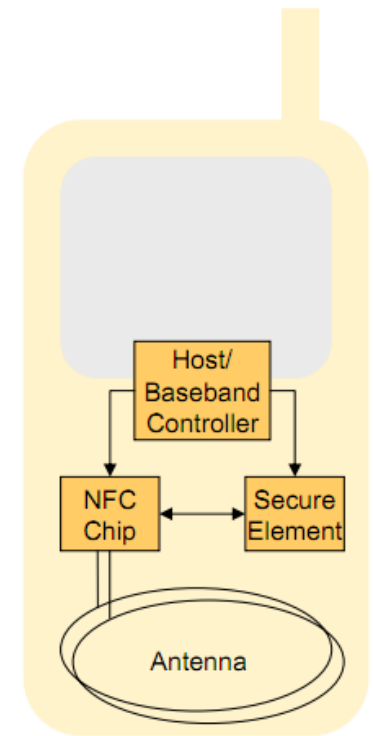
NFC Tag

The NFC tag is a thin simple device containing antenna and small amount of memory. It is a passive device, powered by magnetic field generated by the reader device. Depending on the tag type the memory can be read only, re-writable, and writable once



NFC Architecture & Secure Element

- NFC Chip for basic NFC communications
- Secure Element (SE)
 - Secure storage to provide a standard and secure environment to manage multiple applications in a multiple tenants environment
 - Special hardware for random numbers generation of keys
 - SE can be accessed through Baseband Controller (internal) and RF Field (external)



Implementation of SE

- SIM Card
 - Issuer: MNOs
 - SIM is more flexible as no “Card-Slot” is needed
 - “NFC” SIMs can be used in regular (non-smartphones) phones
- Secure Memory Cards
 - Issuer: Banks for mobile payment
 - Micro SD Card Slot Required
- Integrated in Handset
 - Issuer: ?
 - Handset belongs to consumer
 - SmartCard Chip always in Handset
 - Will evolve to multiple SEs

Many Mobile Applications with NFC



We may already have contactless payment cards that we don't know

Look for the symbol on the front or back of your cards



American Express Expresspay™

Antenna



NFC chip

Discover Zip™



Mastercard Paypass™

Smart Chip

Contactless



<http://www.mastercard.us/paypass.html#/home/>

Google Wallet with Citi Bank Mastercard



http://www.youtube.com/watch?v=DsaJMhcLm_A

VISA payWave™



STEP 1:
Look for this symbol at checkout.



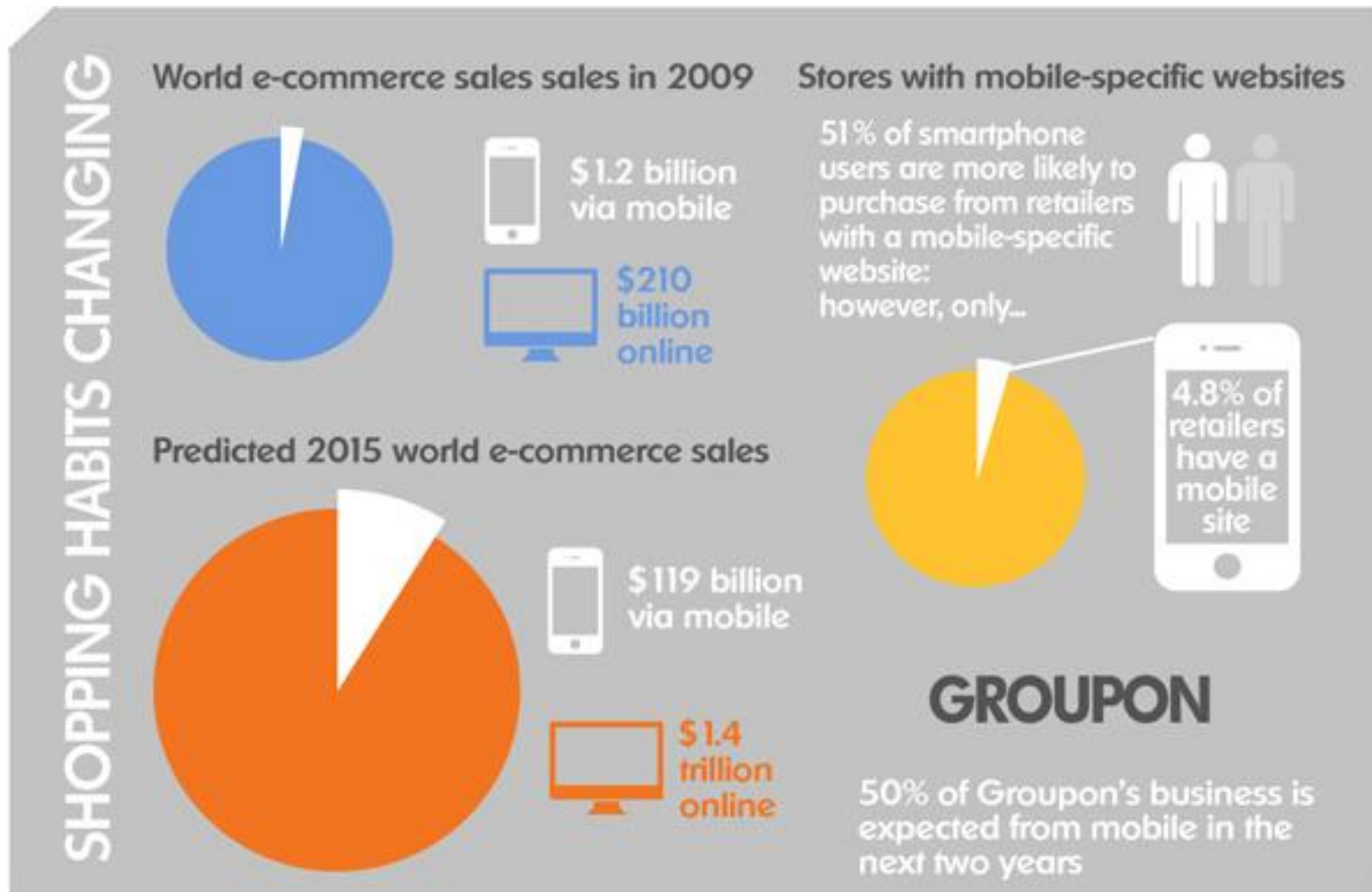
STEP 2:
Wave your card with Visa payWave or Visa Micro Tag in front of the secure reader. The reader will indicate that your transaction has been processed.



STEP 3:
Collect your purchases and go. If you want a receipt, just ask.

Excitement in NFC and Mobile Commerce

High Growth in Mobile Commerce




Retail 2.0 is already on the way...

- 90% of the overall installed handset base will be smartphones by 2014*
- 70% of shoppers use smartphone while shopping in-store**
- 74% of smartphone shoppers made a purchase as a result of using smartphone**
- The smartphone is becoming the platform for shopping experience AND a unique opportunity for retailers to engage with customers in the store

*A New Age of Mobile Services, Gartner Inc., (Oct. 29, 2010)

** The mobile movement study (April 2011)

Transitioning from paper to digital format

- 99% of paper coupons never redeemed
 - ~10% gift card dollars never spent
 - Loyalty cards underutilized
- 
- Digital distribution of free and prepaid offers
 - Digital coupons have 10-20% redemption rates
 - Location-based loyalty services

Google Wallet Experience

SEARCH



Discover offers online or in-app, and save

PAY



Tap to pay and redeem offer at POS

SAVE



Manage and redeem offers, gift cards and loyalty

Sample of new NFC applications



M to M



Single Top
Location Based



Counterfeit
detection of
food, drugs,
consumer goods



Peer 2 Peer
Social
Networking



Room key for
home, office
and hotels



Creative
Gaming Use
Cases

Mobile Commerce in Asia

Mobile Commerce in China

- In 2005, TOM partnered with Union Mobile Play, the sole authorized mobile payment gateway in China, to develop bank card, debit card and credit card mobile payment. Customer pay via mobile phone bill even plane tickets.
- In 2007 China Unicom and Smartpay Jieyin launched “China Unicom Mobile Wallet” on utility bill, insurance, lottery ticket.
- China’s m-commerce reached RMB 1.3 Billion (US \$163 Million) in 2006. Forecast to reach RMB 7.6 Billion (US \$953 Million) by 2010.
- Since it was founded in 2002, UnionPay has issued more than 2.38 billion bank cards through its members.
- Total transaction amount switched by UnionPay network in 2010 exceeded RMB11,200 billion, a year-on-year growth of 46%. Today, all bankcard issuers in China are members of UnionPay and UnionPay cards are accepted in 104 countries and regions.

Jiepiang in China



Jiepiang, similar to Foursquare, is partnering with 3,000 stores in six cities to roll out NFC payment to give offers after customers “check in”.

JC Decaux Smart Posters in Australia



<http://www.youtube.com/watch?v=SVtnxaPbtjE>

Virtual Grocery Shopping in Korea Subway Station



<http://www.youtube.com/watch?v=fGaVFRzTTP4>

Japan's Suica for Transit and mobile payment



Myths, Hypes and Facts

Myth #1 - NFC phones are not secure for mobile payment

- NFC phones with Secure Element offer much more security with pin, tokens etc., as compared to magnetic stripe or contactless credit cards
- NFC antenna is turned off when the phone is not in the “active” mode, so, info cannot be easily sniffed
- Contactless transit cards are based on NFC technologies and have been in used for many years without major security issues

Myth #2 - Not enough POS terminals

- Over 1 million contactless POS terminals will be installed in 2011 globally*
- 15% of top 150 US Merchants are equipped with Contactless POS terminals*
- Visa and Mastercard have issued statement to shift card fraud risks to the merchants who do not upgrade their POS by Oct. 2015
- By 2016, 85% of POS terminals will support contactless payment**

* Source: Vivotech, Apr. 2011

** Source: ABI Research, Aug. 2011

Myths #3 - Not enough NFC phones

- Less than 40 million NFC handsets in 2011^{*}
- Smartphones are expected to represent 44% of all mobile handset shipments by 2014^{**}
- 31% of all mobile phones or 580 million NFC handsets in 2015^{***}
- 630 million handsets, representing 40% of all mobile phones shipped, will come with NFC in 2015^{****}

* NFC Times

** Gartner

*** iSupply Aug. 2011

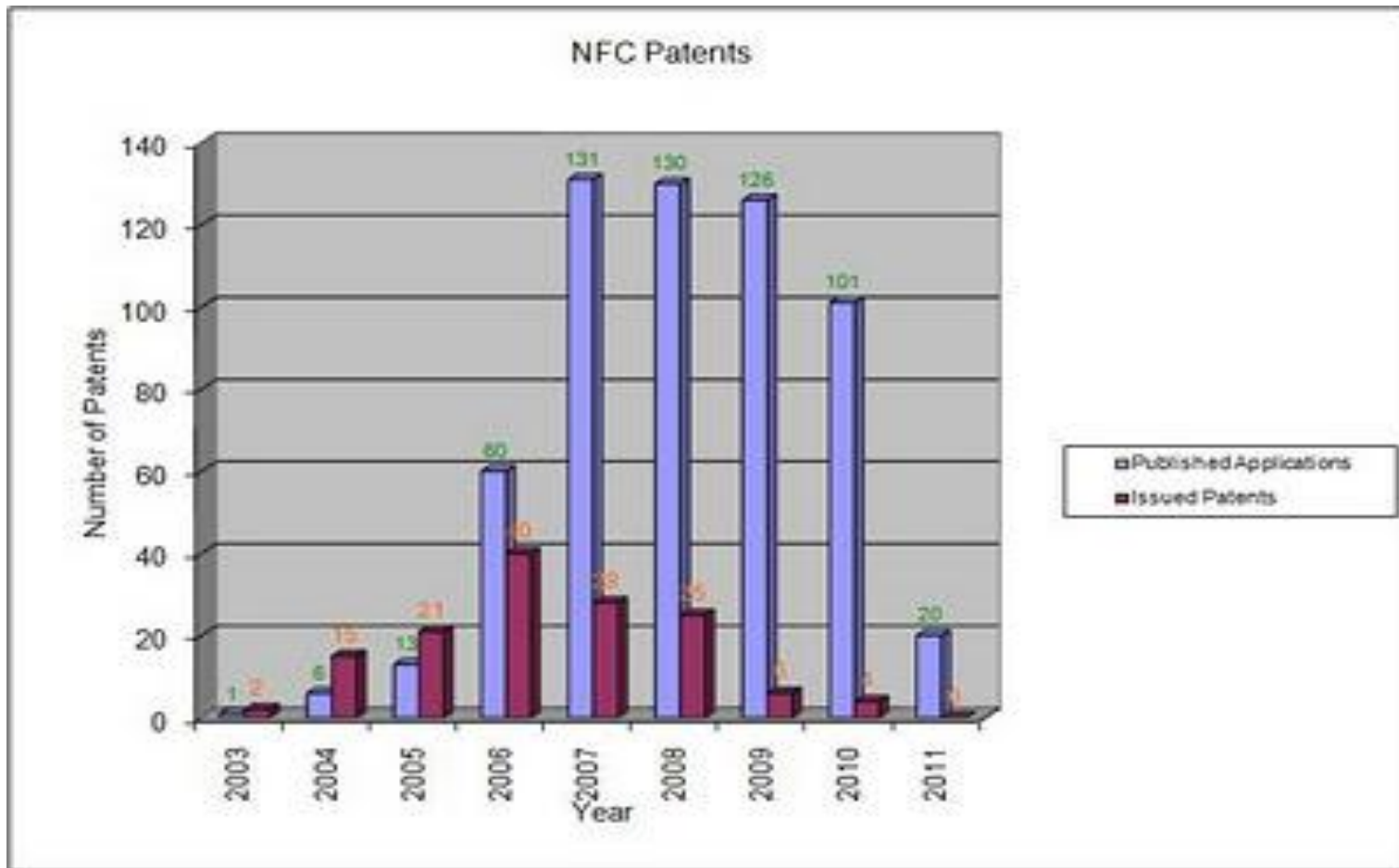
**** Informa Telecoms & Media

Hypes – explosive growth in NFC phones

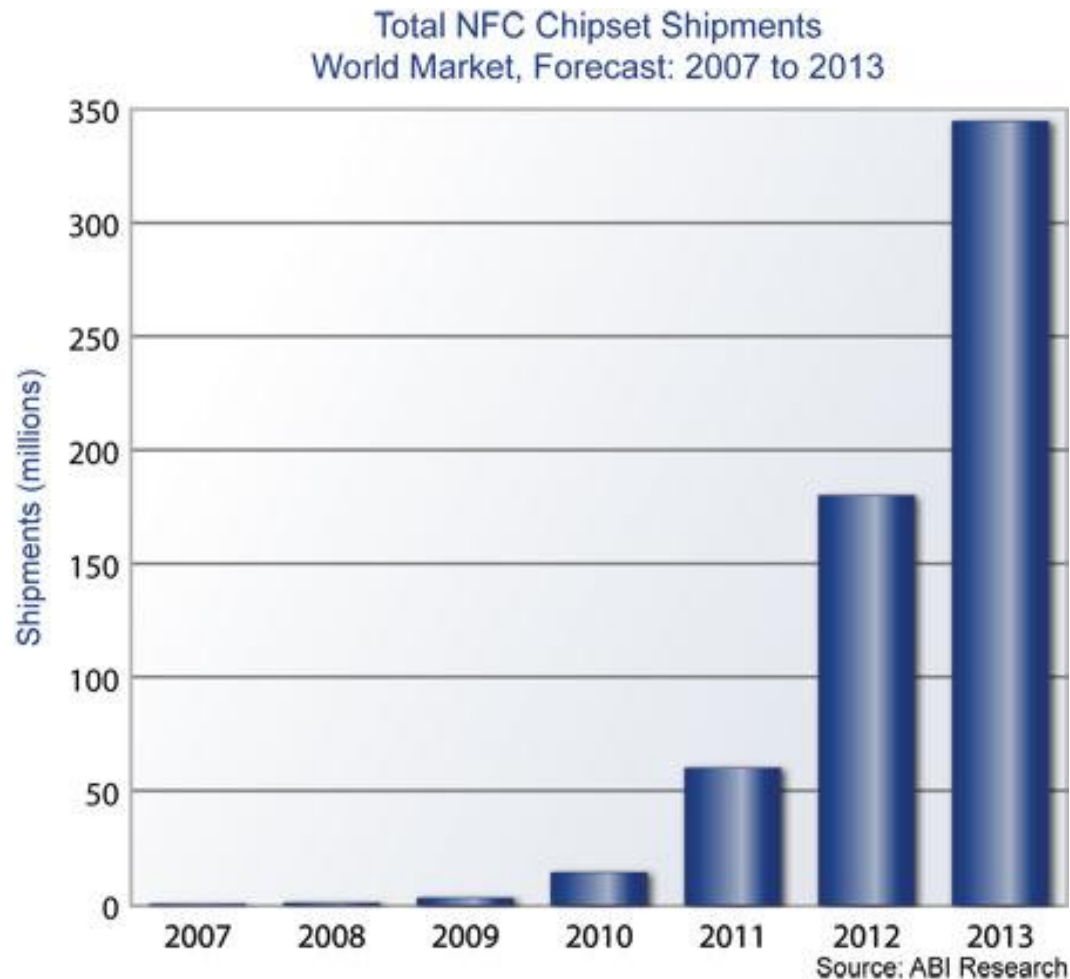
- Initial forecast of 90 million smartphones in 2011 with NFC is now reduced to around 40 million units
- Rumors of Apple iPhone 5 with NFC which turned out to be iPhone 4S with no NFC
- Many other choices for mobile payment that don't need NFC phones
 - M-Pesa in Kenya is based on SMS
 - 90+% of residents of Hong Kong uses Octopus contactless cards for transit and payments daily

***Source: iSupply Aug. 2011

Fact #1 – Large number of NFC patents



Fact #3 - NFC will be in many devices



Fact #4 – Growing number of places supporting NFC Payment



NFC Resources

<http://www.meetup.com/NFC-App-Dev-Silicon-Valley>

<http://www.nearfieldcommunication.com>

<http://www.open-nfc.org>

<http://developer.android.com/reference/android/nfc/package-summary.html>

<http://developer.sprint.com/dynamicContent/nfc/>

<http://www.nfc-forum.org>

[http://en.wikipedia.org/wiki/Near field communication](http://en.wikipedia.org/wiki/Near_field_communication)

Q & A

ISIS™ Mobile Wallet promo



[http://www.youtube.com/watch?v=7ElyAoID2J](http://www.youtube.com/watch?v=7ElyAoID2JE)
E

Tappats NFC for Stanford Bus



<http://www.youtube.com/watch?v=WDsJ5594hq8>

Thank you