Making Money with NFC

NFC Forum

CTIA Wireless San Diego

October 8, 2009
Today’s Agenda

2:00-2:10  Welcome
           Debbie Arnold, NFC Forum

2:10-2:30  Introduction to the NFC Forum/ Overview of Use Cases
           Dave Wentker (Visa, Inc.), NFC Forum Board of Directors

2:30-2:50  Overview and Status of Compliance Program
           Matt Ronning (SONY), NFC Forum Compliance Committee Co-Chairman

2:50-3:00  Q&A

3:00-4:45  Panel: Making Money with NFC
           Panelists: David de Kozan (Cubic), Dave Wentker (Visa), Mohammad Khan (ViVOtech)

3:00-4:00  Q&A
Please introduce yourself and your interest in NFC
NFC Use Cases

Dave Wentker
NFC Forum
Board of Directors
The NFC Forum

- Established in late 2004
- Philips, Nokia, and Sony were founding members
- Steady growth each year

Now 140 members from all areas of NFC ecosystem
## Members

### SPONSOR MEMBERS

- Innovision
- Nokia
- Samsung Electronics
- MasterCard Worldwide
- NXP (Netherlands)
- ST (STM)
- Inside Contactless
- NTT Docomo
- Sony
- Microsoft
- Panasonic
- Visa
- NEC
- Renesas

### PRINCIPAL MEMBERS

- American Express
- KDDI
- SEL
- Broadcom
- Motorola
- Texas Instruments
- AT&T
- LG
- Skidata
- DNP
- Qualcomm
- Toppan Forms
- BlueChip Technologies
- Marvell
- Sony Ericsson
## Members

### NON-PROFIT MEMBERS

- University of St. Gallen
- IQT
- avu innovation
- CES
- TMF
- BWIN
- FIRA
- STOLPA
- Irene
- ITC
- TDK
- JICSAP
- Transport for London
- Consorzio Triveneto
- ETRI
- MOBEY Forum
- VIV
- AT4
- ATML
- ARM
- E-logic
- ITRI
- Vodafone
- SGS
- Collis
- PaySafe
- Venyon

### ASSOCIATE MEMBERS

- Alcatel-Lucent
- Gemalto
- CDG
- NXP Semiconductors
- SanDisk
- Sasken
- CINTERION Wireless Modules
- Toshiba
- TOSHIBA LEADING INNOVATION
- T&D Group
- RGB
- PARrott
- LG
- SK telecom
- Sprint
- Ericsson
- VISA

### IMPLEMENTER MEMBERS

- Adamsoft
- TRANZFINITY
- Compaq
- Belden
- D-Link
- mobilkom Austria
Our Vision

The vision of the NFC Forum is to enable users to access content and services in an intuitive way, leading to...

a world of secure universal commerce and connectivity

in which consumers can access and pay for physical and digital services

anywhere, at any time, using any device
The NFC Ecosystem is Broad and Complex
We Have Come a Long Way, but There Is Much To Do

• Consumer feedback from projects has been extremely positive.

• We now understand the complexity of the ecosystem and are sharing lessons learned in projects around the globe.

• The NFC Forum still faces major milestones to facilitate development and deployment and ensure interoperability.

• The best talents, companies, and knowledge in the NFC industry are in the NFC Forum and will work together to make NFC grow.
We Are Well into the Journey

Phase One
Define and Stabilize Technology

Phase Two
Enhance Technology
Support Interoperability
Support Ecosystem

Phase Three
Refine Technology
Expand Ecosystem
Promote End-user Usage

2007  2008  2009  2010  2011/12
Cooperation is Key to Success

- NFC is an ecosystem – new services, new opportunities, intersection of multiple industries.
- NFC deployment will be service driven, not a technology push.
- Payment, access, and ticketing via NFC phones are the first applications; others, especially for consumer electronics, will follow.
- Building the NFC ecosystem requires cooperation among the stakeholders.

We have the right people, programs, and tools to do it!
NFC Core Applications

NFC Connect
- Set up wireless home office connections
- Access buildings and events
- Touch your camera to a printer to print

NFC Access
- Read smart posters
- Share business cards

NFC Transactions
- Pay for goods and services
- Buy transit tickets, and access trains, planes, etc.
Major (Public) NFC Projects Globally

Over 100 NFC projects, trials, and commercial deployments world-wide have shown strong adoption and positive feedback from users about ease-of-use.
Payment and Ticketing with Mobile Have Led the Way

- Easy to build on existing contactless infrastructure
- Mobile devices are becoming personal devices and easy for the consumer to use and understand
- Players are in place
- Business case issues being worked out
But NFC Is Not Just Mobile

• Early applications have exploited the convenience of today’s mobile phone
• But NFC brings value to many other electronics as well
New Business Opportunities

Target Verticals that can benefit from NFC

- Financial services
- Transportation
- Retail
- Health Care
- Automotive
- Travel and Entertainment
- Consumer Electronics

...and many more!
Example: Consumer Electronics

- **Pairing NFC Devices**
  - Home computer components
  - In-car devices
  - Home entertainment systems
  - Headsets and handsets
  - Cameras and printers / digital frames

- **Connectivity**
  - Quick and secure WLAN set-up
  - Fast data transfer
  - Audio handover

- **Information Gathering**
  - Read product history from smart tag to NFC phone

- **Asset Management**
  - Use NFC phones to read smart tags per product for inventory control
Example: Health Care/Social Benefits

- **Payment**
  - Pay with NFC phones at contactless POS

- **Information Gathering**
  - Use NFC devices to read patient history from smart card or device-to-device

- **Access**
  - Ensure secure hospital area access for personnel with NFC device and contactless reader

- **Asset Management**
  - Use NFC devices to read smart tags on prescriptions to track inventory

- **Reporting**
  - Use NFC devices to track patient visits
  - Record activities performed by health care workers with NFC devices and smart tags
NFC:
What’s it going to take to make it real?
Step #1: Stable Specs

- The Forum has finalized 11 specifications, with 2 candidate specifications pending.
- These will enable a basic level of interoperability.
- Members are already using them in over 100 projects around the world.
Step #2: Compliance Program

• The Forum has priority work to introduce a Compliance Program, with testing tools, a certification mark, and mechanisms to establish product and service interoperability.

• This will enable vendors to build global products.
Step #3: Build the Ecosystem

- The Forum announced its liaisons with GSMA, Mobey Forum, ETSI, Smart Card Alliance; many more are in progress
  - Liaisons are key to building out the ecosystem and ensuring interoperability
- The Forum introduced a new Implementer level of membership to attract business interests and vertical market players
Step #4: Go Public

For use in smart posters.
Free license at
www.nfc-forum.org/N-Mark

- Get webcast slides and recording www.nfc-forum.org/resources/presentations/
- Download specifications www.nfc-forum.org/specs
- Send questions to info@nfc-forum.org
- Join the NFC Forum! www.nfc-forum.org/join
NFC Forum Compliance Program Overview

Matt Ronning
Compliance Committee Chairman
Wireless Market Space

- **Wireless USB/Ultrawideband**
- **WiFi**
- **WiMax**
- **Bluetooth**
- **3G**
- **GSM**
- **NFC**
- **ZigBee**

Data rate

- 1Gb
- 100Mb
- 10Mb
- 1Mb
- 100Kb

Range

- 0.01m
- 0.1m
- 1m
- 10m
- 100m
- 1km
- 10km
Relationship to Other Standards

• Proximity and Vicinity Standards
  – ISO/IEC 14443
    • Included as a base standard in Digital Protocol and Analogue specifications
  – ISO/IEC 18092 – NFCIP-1
    • Included as a base standard in Digital Protocol and Analogue specifications
  – JIS X 6319-4 – FeliCa
    • Included as a base standard in Digital Protocol and Analogue specifications
  – ISO/IEC 15693 – Vicinity
    • Out of scope of NFC Forum work
NFC Forum Technology Architecture

NFC Card Emulation Mode

Peer-to-Peer Mode

Reader/Writer Mode

Applications

Card Emulation
Smart Card Capability for Mobile Devices

LLCP
Logical Link Link Protocol

NFC Forum Protocol Bindings
IP, OBEX, ....

RTD
Record Type Definition &
NDEF
Data Exchange Format

Tag type 1,2,3,4

Mode Switch

RF Layer ISO 18092 + ISO 14443 Type A, Type B + FeliCa

ADVANCING NEAR FIELD COMMUNICATION TECHNOLOGY
Eleven Specifications Released to Date

<table>
<thead>
<tr>
<th>Specification</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>• NFC Data Exchange Format (NDEF)</td>
<td>• Common data format for devices and tags</td>
</tr>
<tr>
<td>• Generic Control RTD</td>
<td>• Way to request an action</td>
</tr>
<tr>
<td>• NFC Record Type Definition (RTD)</td>
<td>• Standard record types used in messages between devices/tags</td>
</tr>
<tr>
<td>• Text RTD</td>
<td>• For records containing plain text</td>
</tr>
<tr>
<td>• Uniform Resource Identifier (URI) RTD</td>
<td>• For records that refer to an Internet resource</td>
</tr>
<tr>
<td>• Smart Poster RTD</td>
<td>• For posters with tags with text, audio or other data</td>
</tr>
<tr>
<td>• Connection Handover</td>
<td>• How to establish a connection with other wireless technologies</td>
</tr>
<tr>
<td>• NFC Tag Types 1-4 Operation</td>
<td>• Defines R/W operation for NFC tags</td>
</tr>
</tbody>
</table>
Work in Progress

• Candidate Specifications (publicly available free from the NFC Forum website)
  – Digital Protocol
  – LLCP

• Other Specifications in progress
  – Signed NDEF RTD
  – Simple NDEF Exchange Protocol (SNEP)
  – NFC Controller Interface (NCI)
  – RF Analogue
  – NFC Activities Specification

• Check for updates at
  http://www.nfc-forum.org/specs/
NFC Forum Compliance Program Objectives

• Develop a means of establishing compliance and interoperability with the Forum’s published open standards

• Develop a product certification program with a consumer-recognizable trademark guaranteeing the NFC-brand promise of compliance and interoperability
Questions to Answer

• To meet these objectives, the Compliance Committee had to answer the following questions:
  1. What does a device have to do in order to be certified?
  2. What needs to be certified, how will it be certified, and how do we track devices through the process?
  3. How and what do we have to test (or not test) for conformance and interoperability?
Status of Compliance Work

• Over 100 representatives of 30 member companies within the Forum have worked for the past 2-3 years on:
  – Defining minimum levels of interoperability
  – Developing a certification program
  – Defining and developing test procedures, tools, and test laboratory relationships

• “First Wave Certification Program” should be ready in late 2010
Types of Testing

Conformance Testing

Interoperability Testing

✓ NFC Forum is focusing on **Conformance Testing**
Certification Process Overview

- Test tool Vendor
  - Validation Request
  - Test tool approval
  - Tool Sales

- Certification Test Lab
  - Product submission
  - Test results report

- NFC Forum
  - Certification Request
  - Certification approval

- Certification Applicant
  - Initial Registration
  - Certification Request

- Third party
  - Validation
  - Validation Results
  - Test Tool Submission

- Certification Administrator
  - Test results report
  - Certification approval
First Wave Certification: Conformance Testing

- Applicant for First Wave Certification must:
  1. “Self Confirm” Device is compliant to certain existing NFC Forum Specifications, which may or may not have Test Cases available, including but not limited to:
     - Digital Protocol
     - Activities
     - Tag Operation
     - Others?
  2. Submit Device for Certification Test
     - Conformance Test using NFC Forum-Approved test tool
     - Conformance Test coverage will be different than Step 1, and will include Tag Operation, Digital Protocol, and Activity Specifications
First Wave Certification: Interoperability Testing

• The NFC Forum also strongly recommends some Interoperability Testing
  – NFC Forum will define and support an interoperability test event (“plugfest”) by using a “Test Bed” to decrease chances of interoperability issues.
  – Interoperability testing by the applicant is not required at this point in First Wave Certification. However, it is strongly recommended (and could become mandatory).
  – Certification will not be denied based on the results of interoperability testing.
Target Schedule

Certification

1st Certification Wave
- Digital Protocol
- Activity
- Tag Operation
- LLCP (Peer-to-Peer)
- RF Analog

2nd Certification Wave (Advanced Certification)
- Digital Protocol
- Activity
- Tag Operation

Plugfest

- PlugFest

2009 2010 2011 2012
Ongoing Activities

• High-Level Conformance Requirements (HLCR) document that defines minimum levels of interoperability for certification

• Traceability Matrix to enable implementers to map requirements in the HLCR document to technical specifications

• Certification administration
  – Selected The Open Group as Administrator
  – Policy/procedures almost complete
  – Development and implementation underway
Ongoing Activities (2)

- Developing partnerships with test equipment manufacturers
  - Integri and AT4 Wireless selected to collaborate with the NFC Forum
- Creating Requirements Catalogs, Test Purposes, and Test Cases (1800+ to date)
- Prioritizing, selecting, and completing test cases for First Wave Certification
- Selecting the Test Tool Validation House
- Drafted RF testing requirements
Final Comments

• As a developer who is interested in getting your product certified, your first step should be to join the NFC Forum

• Good next steps would include:
  – Review the High Level Conformance Requirements Document
  – Review the NFC Forum Certification Policy Document
  – Participate in Testing WG activities finalizing Test Cases and Test Application SW
  – Work with Test Tool Vendors (i.e., provide a sample, familiarize yourself with tools, etc.)
Questions?
Panel: Making Money with NFC
Panelists

- Mohammad Khan, CEO, ViVOtech
- Dave Wentker, VP, Visa, Inc.
- David de Kozan, VP, Cubic
NFC Value Propositions for Retailers

Mohammad Khan
ViVOtech
NFC Provides a Personalized, Dynamic Location-Based Connection to the Customer

- From Back Pocket to Front Pocket
- From Paper to Mobile Offers
- Near-Store to In-Store Experience
- From Mass to Personalized
- From Expensive to Preferred Payments

NFC – Near Field Communication Based on ISO Standard & Compatible with Contactless Payment Standard
NFC Smart Posters Enable Touch Points In and Near Store

Near Store:
- Mall’s entrances
- High-traffic areas such as food court, escalators

Touch Points:
- Digital signage
- Kiosks
- NFC Smart Posters

In Store:
- Store’s entrances
- Every department
- Merchandise fixtures
- Every wrap stand

Touch Points:
- Kiosks
- Price-checkers
- NFC Smart Posters
- Contactless readers at the POS

Convert Browsers to Buyers
Benefits to a Retailer

Lower Cost, More Effective Retailer Card/Loyalty

Revenue Growth

One-to-One Marketing

Real Time Customer Analytics

Deliver WHAT Customers Want WHEN Customers Want It!
1. Customer Taps NFC Smart Poster at Retailer

2. Consumer and Tag ID info sent to Back-End

3. Marketing server issues personalized promotions to phone based on location, interest and personal profile.

Value Proposition 1:
Drive Impromptu Traffic Using Location Based, Personalized, Mobile Marketing

Consumer I.D.
Tag I.D.

Customer #1
Customer #2

Electronic Redemptions

Patent pending
Value Proposition 2:
Tap on Smart Poster to Up Sell with Time-Limited Offers

1. Consumer taps poster to save time and find matching accessories and outfits

2. Based on pre-defined matches, consumer profile and store inventory, server replies with options in different categories

3. A follow-up message gives an incentive for the consumer to buy the combination today for a discount.
Value Proposition 3: Drive Easy Distribution of Retailer Prepaid Cards

- User taps the NFC phone to the Retailer Smart Poster
  - NFC phone will connect to Retailer content website
- Browser will ask user to confirm Retailer gift card download
  - Phone receives the SMS and open wallet application
  - Wallet will initiate the communication with OTA server
  - Wallet will initiate the card download through OTA servers
  - Card is successfully downloaded and ready to use by customer
- User can use the card at point of sale terminal for top-up or payment

Note: Card could be co-branded or private level
Value Proposition 4: Drive In-Store Online Up-Sell of Low Inventory Products

- User taps the NFC phone to Retailer Smart Poster
  - NFC phone will open ViVOwallet application
- Wallet will provide product description based on Smart Poster
- Wallet will display product cost when user clicks “Buy”
  - At check out, wallet will display all credit/debit cards in wallet for payment
  - Customer will select card for payment
  - Wallet will show the confirmation page with the check out basket
  - Wallet will connect to retailer back end for authorization and display tracking information
- Product will be shipped to customer ship to address.

Note: Customer can also use retailer card or coupons during purchase

Patent pending
**How Does A Retailer Benefit?**

### Cost Savings
- Lower transaction fees
- Reduced fraud
- Chargeback/fraud protection

### Revenue Growth
- Convert browsers into buyers
- Drive traffic to stores
- Generate up-sell & deliver convenience

### One-to-One Marketing
- Offer personalized promotions
- Deliver location-based real time offers
- Generate high impact with “tap and go”

### Real-time Customer Analytics
- Collect demographic data
- Gather shopping habits and customer insight
- Measure campaigns/product-placement effectiveness

**Deliver WHAT customers want WHEN customers want it!**
Thank You

Mohammad Khan
khanm@vivotech.com
415-609-0208
Mobile Payment
Public Transport
Building on Contactless Programs
David DeKozan
Transit and Contactless

- Virtually every major metropolitan transit system has either installed a contactless fare system or is in the process of doing so
- Major programs include London’s Oyster, Washington’s SmarTrip, and Atlanta’s Breeze
- Tens of thousands of contactless terminals have been deployed in conformance with ISO 14443 standards
- These points of acceptance are spread widely across concentrated geographies and are in close proximity to a wide range of retailers
- Transit users are “trained” in the use of contactless and many interact with fare systems every day
- Transit users cut across all demographic profiles and often make up more than 50% of a regional population
<table>
<thead>
<tr>
<th>City</th>
<th>Terminals</th>
<th>Projected Users</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>1,500</td>
<td>824,000</td>
<td>Full Operations</td>
</tr>
<tr>
<td>Boston</td>
<td>4,000</td>
<td>1,800,000</td>
<td>Full Operations</td>
</tr>
<tr>
<td>Chicago*</td>
<td>5,000</td>
<td>3,500,000</td>
<td>Transitional</td>
</tr>
<tr>
<td>Houston</td>
<td>1,500</td>
<td>750,000</td>
<td>Full Operations</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>6,600</td>
<td>3,600,000</td>
<td>Mid-Launch</td>
</tr>
<tr>
<td>Miami</td>
<td>2,000</td>
<td>900,000</td>
<td>Initial Launch</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>1,200</td>
<td>425,000</td>
<td>Full Operations</td>
</tr>
<tr>
<td>New York (PATH)</td>
<td>350</td>
<td>400,000</td>
<td>Full Operations</td>
</tr>
<tr>
<td>Philadelphia (PATCO)</td>
<td>200</td>
<td>35,000</td>
<td>Full Operations</td>
</tr>
<tr>
<td>San Diego</td>
<td>1,200</td>
<td>370,000</td>
<td>Initial Launch</td>
</tr>
<tr>
<td>San Francisco</td>
<td>4,500</td>
<td>2,800,000</td>
<td>Mid-Launch</td>
</tr>
<tr>
<td>Seattle</td>
<td>3,000</td>
<td>947,000</td>
<td>Mid-Launch</td>
</tr>
<tr>
<td>Wash/Balt</td>
<td>4,500</td>
<td>2,700,000</td>
<td>Mid-Launch</td>
</tr>
</tbody>
</table>
Responding to a broad user demographic

Age of Transit Passengers:
- 14 and under, 4.0%
- 15 to 19, 8.5%
- 20 to 24, 11.5%
- 25 to 34, 21.7%
- 35 to 44, 20.2%
- 45 to 54, 17.5%
- 55 to 64, 9.8%
- 65 and over, 6.7%

Source: American Public Transportation Association (APTA), Profile of Public Transportation Passengers, 2007
Mobile Phones offer the potential to serve in many fare system roles:

- An internet access device
- A portable point of sale device
- A self service kiosk
- A customer service response node
- A personalized mail box
- A delivery channel for promotional messaging
- A fare payment device
Transit as a Merchant

• Transit authorities currently accept credit and debit cards at vending machines, on-line, and via attended service locations

• There is a trend to open systems to contactless payments with each device becoming a specialized POS terminal

• As with other merchant categories, transit authorities will wish to manage the payment behavior of their customers to drive cost optimization

• With a mix of pre-paid, account based, credit, and debit products available, product strategies will need to consider such management

• For those running card based systems, the application enables a mobile program without dependency on outside “card” issuers or major infrastructure changes
Many pilots have been performed and a few full scale programs have been launched
- Tokyo (full roll out)
- San Francisco (pilot)
- London (pilot)
- Germany (small scale full roll out)

All have met with substantial positive reaction by the public

The technology works

The key is resolving the commercial case, getting handsets into the market, and establishing the OTA eco-system

Transit could be a strong entry point upon which to support initial investments
Data from the London pilot

• More than 90% of trialists found the product to meet or exceed their expectations

• Almost 2/3 of trialists were highly likely to take up Oyster on their mobile phones

• More than half reported the Oyster feature would highly influence their choice in mobile phone

• Oyster usage for those carrying phones increased as trialists reported a lower propensity for “forgetting their Oyster card”

• Customers reported a desire for a single customer support line
APTA NFC architecture...a work in progress
Getting Traction with Mobile

• The immediate focus could start with customer service strategies leveraging immediately available technologies and infrastructure
• There are many things to “borrow” from mobile commerce models being followed in other segments
• There is no reason to wait for NFC
• A properly crafted mobile solution has a sound basis on its own and is only enhanced by the addition of NFC
• Technologies such as stickers and memory cards may act as a bridge between mobile service and payment while the NFC ecosystem and related standards work through their stages of development
• The infrastructure is there….let’s get moving