

Near Field Communication  
A Replacement for Plastic Cards

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# Near Field Communication A Replacement for Plastic Cards

## Overview

RFID cards based on ISO 14443 and FeliCa technologies have been in use in the areas of public transport, electric payment and security for years. Over these years, huge investments have been made for infrastructure development and deployment. As of today, about 1 billion cards and 10 million readers based on Felica alone are in use. These technologies allow cash-less transactions, but demand carrying of multiple cards – one each for the metro train, office access, credit/debit card and any such services.

With the emergence of NFC technology, the intelligence of multiple cards can be accommodated in a single device, thereby eliminating need of carrying plastic cards. The biggest advantage of NFC is that it is backward compatible with ISO 14443 and Felica, which means that the existing infrastructure would not need to be changed – and NO extra investment needed for the upgrade.

For any technology to mature, it is imperative to standardize it. Standardization helps the implementer ensure his product is interoperable with other related implementations in the market. NFC has been standardized by NFC Forum as ISO/IEC 18092 and by ECMA as ECMA-340. Both standards are essentially same, except of course for their name.

## Features of NFC

- Standardize as ISO/IEC 18092 and ECMA-340
- Short Range (up to 10 cm) wireless technology
- Operating @ 13.56 MHz
- Transfer speeds – 106, 212 & 424 Kbps
- Quick Setup < 0.1 ms
- Supports Active & Passive modes
- Compatible with RFID

## Few Applications of NFC

1. With a soft “ticket” in an NFC enabled phone, a user can wave his phone against the ticketing machine for a payment, and his card will be debited automatically. He can recharge the ticket after the credit exhausts.
2. With a soft card in NFC enabled mobile phone, a user can pay for items bought in a store having a NFC compliant POS terminal.
3. A user can get information about a product from an NFC enabled advertising sign board simply by waving his NFC enabled PDA/phone past the board.
4. Business cards can be exchanged between NFC enabled phones by bringing phone close to each other.
5. Pictures in NFC enabled cameras can be transferred to NFC enabled printers for printing.



**Figure 1:** Applications of NFC Technology

## Use-Case Scenario: Jacob’s Day with an NFC Phone

Jacob takes a bus to reach his office. He waves his mobile phone in front of the NFC enabled ticketing machine installed at the entry of the bus and keys in his destination, which allows him to enter. On reaching his office, he buys his coffee by waving his mobile over the reader on the vending machine. A client happened to be visiting him today, with whom he exchanges visiting cards at the end of meeting with a click of a button on his phone. In the evening, he gets a call from his wife who asks him to get some stuff from store. He carries the items he picked from aisles to the counter and pays for everything using his mobile at the NFC enabled POS. On his way back to home, he finds a poster of newly released movie. He waves his phone over the poster and tons of relevant details like the star-cast, theaters and show timings, a link to book the tickets and movie wallpapers are downloaded to his cell phone. He visits the link from his GPRS activated mobile and books the tickets. He surprises his wife by taking her to movie, thus being spared for forgetting one item on the list his wife gave him.

## Market Acceptance

VISA Europe has already introduced NFC enabled cards and POS (Point of Sale) terminals on their local market. This payment system is introduced as “VISA payWave” where magnetic-strip based cards are replaced by NFC cards. To make a transaction, users wave the card near the POS. This system is the first step in the direction of eliminating plastic cards.

Citibank, VISA and M1 have gone a step further and have undertaken a pilot project in Singapore to fully replace plastic cards by soft cards which can be integrated into cell-phones and PDAs. Bay Area Rapid Transit (BART), Vivotech, Sprint & First Data have joined hands to undertake a similar project in USA in the public transport sector. There are number of similar pilot project under way around the globe, and the results so far are encouraging for the future of NFC technology.

## **Conclusion**

The industry trend suggests that transport, office access and retail will be the first sectors to replace plastic cards with soft cards on a user's mobile phone using NFC technology. The prime focus of the industry is to use the mobile-phone as a card, since it is the most common electronic gadget used by commuters and office goers. NFC technology, however, is not restricted to cell phones, and will soon be integrated into computers, printers, PDAs and other smart devices for a plethora of applications.