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"CONTACTLESS" TECHNOLOGY IS FINALLY READY FOR THE MASS MARKET: NFC IN THE REAL WORLD

By John Elliott and Dave Birch

In today's fast-paced world, it seems absurd that people are still queuing up to buy paper train tickets, hunting for coins to pay for their newspapers, and trekking over to clunky old payment machines in order to get out of a car park – especially when the latest technology can offer much more convenient solutions.

NFC communication is enabled by bringing two NFC-compatible devices within a few centimeters of one another, which is why it's often called "tap 'n go" technology. Customers love the idea of being able to wave their phone to get on the Tube, buy a coffee, or to pay for their parking. The benefits are equally compelling for service providers, vendors and other stakeholders: they have less cash to manage, reduced risk of theft, more information coming back from points of access, as well as an interactive channel to communicate directly with customers.

You might ask why is this a big deal? When it comes to using NFC phones in "the real world", people often ask: couldn't we just use 2D barcodes on our mobile phone screen instead? The simple answer is yes, it's possible, but the truth is that NFC works much better, it's easier, and it's faster.

In our experience, customers will often try to wave their phone in front of a scanner when trying to scan a 2D barcode, but nearly all barcode systems require both the phone and scanner to remain stationary. By comparison, the motion of simply tapping an NFC reader with a mobile phone is a much more natural human gesture. As such, the combination of NFC at the point-of-sale (POS), ticket machine, or time and attendance register and the mobile phone as a carrier looks pretty promising.

NFC in the real world: Public Transport ticketing

Case study: nationwide e-ticketing in Holland

In the late 1990s, nobody realised just how hard it would be to achieve national rollout of interoperable e-ticketing, although Trans Link Systems' (TLS) OV Chipkaart in the Netherlands seems to have achieved this Holy Grail. Trans Link, a company established by the five largest Dutch public transport companies to implement a nationwide payment system for Dutch urban transit, was the first to roll out a nationwide e-ticketing scheme across the whole country. In the future, it may even be possible for standard transport cards from other countries to be accepted within the Netherlands, as well.

The company has developed a smart card system for transport, covering various products – e-purse and passes, and allowing different price mechanisms and different modes of transport such as bus, train, tram, metro and ferry. Cards can either be personalised or anonymous; there are also Limited Use tickets for tourists or other visitors, such as someone who plans to spend just two days in Amsterdam. To date, more than 4 million cards have been issued in the Amsterdam and Rotterdam areas for buses, trams and metro, as well as Connexxion bus services (a nationwide service) that are adjacent to these areas.

TLS is planning for the future, considering broader aspects such as eID and ePayments. A key part of this has been to look at London's new Oyster Card reader that has been designed to accept multiple card types.

Case Study: NoWcard in northwest England

NFC can be used to support paperless ticketing for public transport to help reduce the production and distribution costs connected with traditional paper-based ticketing channels for public transport, and can also increase customer convenience by providing new, secure and simpler ways to purchase tickets.

The UK Department for Transport (DfT) is currently considering various strategies for smart and integrated ticketing schemes. Since the required technology already exists, the DfT is keen to pursue the use of e-ticketing not only to help passengers, but also to reduce congestion, pollution, improve the local environment, and to help plan more effective local transport systems.

In 2010, Consult Hyperion published a report based on an 18-month research project on "The use of Near Field Communication technology in mobile phones for public transport ticketing".

The study included a six-month trial of e-tickets held on NFC mobiles on NoWcard buses in northwest England, using the phones as tickets in order to show the potential for NFC as an alternative to traditional printed tickets.



Screenshot of NoWcard e-ticket on mobile phone

Not only did the NFC technology work extremely well during the trial, but the majority of users were very positive with their overall feedback. As a result, the study concluded that NFC technology is entirely suitable for use as NFC customer media right now. Even more interesting, the same trial also included a bench test to show other uses of NFC, including the ability to top-up tickets "over the air" and the possibility of using NFC phones as inexpensive ticket inspection devices.

NFC in the real world: concerts and sporting events

NFC technology can be used to replace traditional paper tickets with great success. As a result, it's likely that event management will be another area to benefit from this high-tech approach to ticketing.

As anyone who uses an Oyster Card can tell you, electronic ticketing already offers a number of important benefits for commuters, and yet this technology remains largely untapped when it comes with other types of tickets, as the initial roll-out costs and security concerns often discourage stadium managers and other event organisers from adopting this approach.

However, the argument for the use of NFC ticketing in stadiums and concert halls is compelling. If a contactless transaction like Oyster were to be applied to a stadium setting, for example, a consumer would simply need to tap his ticket to a contactless terminal to gain entry. At that stage, the ticket and the reader in the terminal would establish a wireless link, and then simply transfer the information required to complete the transaction – in much the same way as a traditional ticket with a magnetic stripe would.

Instead of relying on easy-to-copy magnetic strips, however, this new generation of NFC tickets would consist of a chip and an antenna, both of which can be built into a wide variety of form factors easily. This capability also gives event organisers new ways to differentiate their particular offering by allowing them to create and distribute branded NFC "tokens" – such as a football-shaped key fob that features their team's logo and colours – in place of a traditional printed ticket.

NFC can also offer enormous operational benefits in terms of both speed and accuracy. With a paper ticket, a member of staff has to examine each ticket, check the date, make sure that the ticket is valid, and so on, in order to ensure that the ticket is legitimate. With an electronic ticket, however, NFC technology can achieve all of these things automatically, thereby speeding up the admission process and also combating fraud at the same time.

NFC in the real world: Parking - *Could the hunt for loose change be coming to an end at last?*

In today's fast-moving world, it seems absurd that people are still waiting for tickets, hunting for coins and trekking over to clunky old payment machines when they need to park – especially when the latest technology can offer much more attractive solutions.

NFC technology can offer a user-friendly way of paying parking fees without coins, tickets, phone calls or SMS. Instead, drivers could simply touch an NFC windshield tag with their NFC phone, and then touch the NFC tag located at the car park entrance or on the parking meter. Parking fees could then simply be charged to the user's normal mobile phone bill or on a credit card. In addition, NFC enabled phones can handle local payments and remote payment through the same application: so you tap your phone on the machine to pay for parking, then later in the day you could top up the parking

remotely. Alternatively, credits could be purchased in advance, to support a Pay As You Go pre-payment model instead.



NFC mobile being used to access parking ticket machine

Either way, by using NFC in this way, parking operators can eliminate queues at payment machines and even develop "smart" parking meters that can communicate with drivers wirelessly. Plus, for service providers, vendors and other stakeholders: they have less cash to manage, reduced risk of theft, more information coming back from points of access, as well as an interactive channel to communicate directly with customers to alert them, for example, that a particular car park is full.

Initiatives like the StoLPaN project are helping to bring projects like this to the masses. A pan-European consortium supported by the European Commission's Information Society Technologies (IST) programme, StoLPaN intends to turn NFC enabled mobile handsets into multifunction terminals with bi-directional interaction between the wireless NFC interface and mobile communication channels. Its chief aim is to demonstrate the use of this technology within the retail logistical value chain, as well as in mobile payment, ticketing, and other uses.

Thanks to initiatives like these, consumers will increasingly be able to use NFC-enabled mobile phones to pay for their parking – and many other things – quickly and easily, without having to carry cash (or even credit cards) everywhere they go. It is a modern solution for a modern world, and one that could eliminate the dreaded hunt for loose change under the car seat, at last.

NFC in the real world: ***Managing Domiciliary Care – and its payment scheme***

NFC enabled phones could play a crucial role for Domiciliary Care Workers, who traditionally get their daily schedule through a number of mechanisms such as emails and secure portals. Their days are divided into visits which usually comprise a small number of activities in small time boxes – usually of about fifteen or twenty minutes. A visit often includes actions such as; agree with occupant/carer activities to be done, complete activities, complete documentation and get sign off, then get information of next visit.

At the end of a shift the completed documentation – including timesheet and expenses log (if any) is reviewed, tidied, completed and prepared for onward sending to the worker's employer for appropriate invoices to be raised on the Local Authority. Inevitably, this whole process is time consuming and means that less visits per day can be made, plus as information is completed manually, often in a hurry in-between visits, errors can occur which require extensive effort to resolve – which means less time is spent by the Domiciliary Care Workers in providing front line services and the costs incurred by the employer are passed onto the Local Authority.

By using technology such as NFC to automate as much of the process as possible, linking it to back-office systems to give staff live information and updates, countless hours will be saved each day from administrative duties and reduced number of errors. In addition, reporting, and the raising of any issues can be done much faster in real time.