

# NFC Enabled E-Services for Employees

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**Abstract** - This project establish a easy shopping for the employees through their smart phones. Whenever they went shop they can pay the Bill through this mobile application. Also the employees in companies pay their transport charges through mobile phone with NFC technology. The application installed in the phone has been paired with the RASBERRY-PI Controller through BLUETOOTH. Already thriving within the telecommunications market, wireless technology is preparing to embrace computing on an even larger scale. Presently, most people encounter wireless local area networks (WLANs) in airport lounges and tech-savvy offices. Everywhere around the world, this new generation prefers the wireless technology for their work and also the technologies are growing by leaps and bound to carry out all the desires of the customers to fulfill their demands. Here we use that wireless technology into the on chip computer (raspberry PI). We are going to implement multiple applications in a single unit. From this we can learn how embedded units are flexible with real time applications. In our project we use two concepts. First one is E-vouchers for employees second one is a E-ticket system all are done with the help of Near field communication (Bluetooth) technology.

**Keywords:** NFC,RASPERRY PI, marketing; mobile devices; coupons; Near Field Communication; vouchers

## I.INTRODUCTION

NFC (Near Field Communication) is a young radio technology which finds special application in the field of mobile consumer electronics. It is designed for bidirectional data transmissions over a distance of up to 10 cm and a maximum data rate of 424 kobo/s. Based on Radio Frequency Identification (RFID) standards according to ISO/IEC 14443, NFC technology works at an operating frequency of 13.56 MHz Consequently, NFC is compatible to existing contactless smartcard technologies such as NXP's Misfire or Sony's Felicia. NFC is standardized in ISO/IEC 18092 and ECMA-340 and ECMA-35 respectively. The development of the specifications is driven by the NFC Forum, a consortium of manufacturers, developers and financial services among others. The integration of NFC Into the number one mobile device, the mobile phone, offers a lot of new business cases.Since its development by NXP Semiconductors and Sony in 2002 several field trials have been accomplished to analyze the characteristics and opportunities in the different areas of application of this technology. Mobile ticketing (In addition to payment, loyalty, access, smart posters, and others) is considered as one of the most promising applications of NFC. Finkenzeller states that the public transport domain is of great potential for RFID and contactless chip cards. He suggests that transport associations in Europe and the USA operate at a

huge loss, which can be improved using contactless chip cards for EFM. The Association of German Transport Companies (VDV) defines EFM as the combination of cashless payment, electronic ticket and automatic fare management in. Today there are already some well-established transport applications for chip cards in big cities using EFM, such as the *Octopus Card* in Honking, *Oyster Card* in London, *delink Card* in Singapore and the *Super Urban Intelligent Card (Suita)* in Tokyo. Imagine you want to go from somewhere in city A to somewhere in city B by train, tram and bus of different operators. In the worst case you have to buy a separate ticket for each stretch of a journey. The idea that consumers can use the entire (national or even international) transport network by using only one application for buying and storing the ticket(s) on a mobile phone would be an advantage for both, customers and transportation companies. Especially in Europe, the creation of such an interoperable solution is a challenge, as regional and national transport companies, each with its own fare management system, need to cooperate. At the moment there are three major electronic ticketing standards in Europe being used in different countries: Calypso (Belgium), ITSO (UK) and the VDV Core Application (Germany). Due to the final outcome and suggestion of the former research project Trans mobile 2 funded in part by the Austrian Federal Ministry for Transport, Innovation, and Technology in the research program Intelligent Infrastructure, the NFC ticketing system presented in this paper is based on which specifies data models and interfaces that integrate all stages of electronic fare management also on NFC enabled mobile phones with secure element.

## II. PROPOSED HARDWARE SYSTEM

### A. E-coupons for Employees

Today, many companies often use coupons with different purposes. Some companies use these coupons as a way to provide additional services to their employees for different shops or business. For example, there are food tickets that employees can use in restaurants where companies have agreements, sometimes in order to pay in kind. Another widespread example of using coupons is in malls and manufacturers. In this concept company provides employees a individual mobile application, whenever they went shop they can pay the Bill through this application. In shops they have Rasperry PI unit both the units are interfaced with Bluetooth.

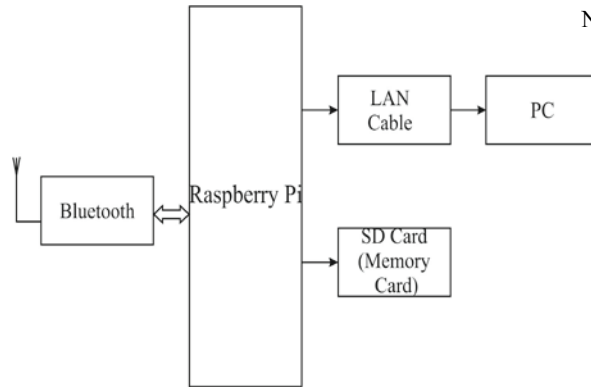


Fig.1 Block diagram of the proposed system



Fig.2 Application in Android Mobile

**B. E-tickets for employees**

A key application of Near Field Communication (NFC can be found in the field of Electronic Fare Management. In our scenario the employees in companies

pay their transport charges through mobile phone with NFC technology there is no need for net connection just they can communicate with the device with their personal phone.

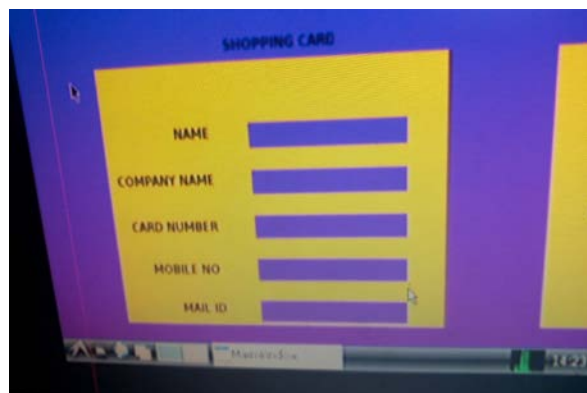


Fig.3 E voucher & E ticketing System

### III RASPERRI PI

The Raspberry Pi is a series of credit card-sized single board computers developed in the UK by the Raspberry Pi Foundation with the intention of promoting the teaching of basic computer science in schools. The original Raspberry Pi and Raspberry Pi 2 are manufactured in several board configurations through licensed manufacturing agreements with Newarkelement14.

#### A. Raspberry PI features

More GPIO The GPIO header has grown up to 40 pins, while retaining the same pin out for the first 26 models as the Model A and Model B. MORE USB, MICROUSD, LOW POWER CONSUMPTION, BETTER AUDIO, NEATER FORM FACTOR. MODEL B+ is suitable and flexibility in embedded systems it is very useful than Model A and Model B.

### IV. SOFTWARE USED

PUTTY is a free and open-source terminal emulator, serial console and network file transfer application. It supports several network protocols, including SCP, and raw socket connection. It can also connect to a serial port. PUTTY was

originally written for Microsoft Windows, but it has been ported to various other operating systems. Official ports are available for some Unix-like platforms, with work-in-progress ports to Classic Mac OS and Mac OS X, and unofficial ports have been contributed to platforms such as Symbian and Windows Mobile. Putty is a client program for the SSH, Telnet and Rlogin network protocols. These protocols are all used to run a remote session on a computer, over a network. Putty implements the client end of that session: the end at which the session is displayed, rather than the end at which it runs. In computing, Virtual Network Computing (VNC) is a graphical desktop sharing system that uses the Remote Frame Buffer protocol (RFB) to another computer. Keyboard and mouse events from one computer to another, relaying the graphical screen updates back in the other direction, over a network. VNC is platform-independent – there are clients and servers for many GUI-based operating systems and for Java.

### V.RESULTS

The NFC technology was successfully applied to develop an interoperable NFC ticketing system. This allows for future extensions and additional cooperating organizations like further national transport companies and transport associations.



Fig.4 Proposed system

### VI. CONCLUSION

An ideal Mobile Payment Solution should be easy to use, secure and cheap. Payment by SMS has some of these benefits but lacks security. Nonetheless, the SMS solution has been greatly successful all across the world, and has promoted the mobile media content industry. SMS however unreliable, this shows us that familiarity and ease of use are key factors to the success of payment solutions. We are also seeing development in NFC technology.

### VII. FUTURE WORK

Near Field Communication (NFC), concerns about security and privacy general consumer interest in mobile, such as purchases on web sites, routine bank services, and electronic receipts and tickets. Mobile ticketing in public transportation is one of the few examples of mobile payment. Thus there is a lot of scope still in the development of a comprehensive Mobile Payment Solution using NFC technology.

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