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A Survey on NFC Technology for Home Automation

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Abstract:
Near field communication (NFC) is a technology that enables smartphones and other devices to establish radio communication with each other by touching them together or bringing them into proximity, typically a distance of 10 cm (3.9 in) or less.The smartphones containing NFC chips are gaining popularity owing to the increasing applications of NFC. NFC tags can be read by NFC devices and can perform subsequent actions such as transmitting data. In this survey firstly a brief introduction is presented about the NFC based systems. In addition, a literature survey is presented. We attempt to increase the awareness about this topic and hope for effective solutions coming up on the same.

Keywords: *NFC, Near Field Communication, RFID, Internet of Things*

1. Introduction

NFC is a radio technology that supports transactions at distances of a few centimeters. NFC is designed to support existing RFID transactions, including contactless payments and some ticketing systems, as well as being a generally programmable platform. During a transaction, one party can be completely inactive, drawing power inductively from the active party. Even the active party draws little power and can be left on all the time with minimal effect on the phone's overall power draw. Also, the nearness of NFC transactions creates the possibility by using proximity as context and triggering an appropriate action almost instantaneously.

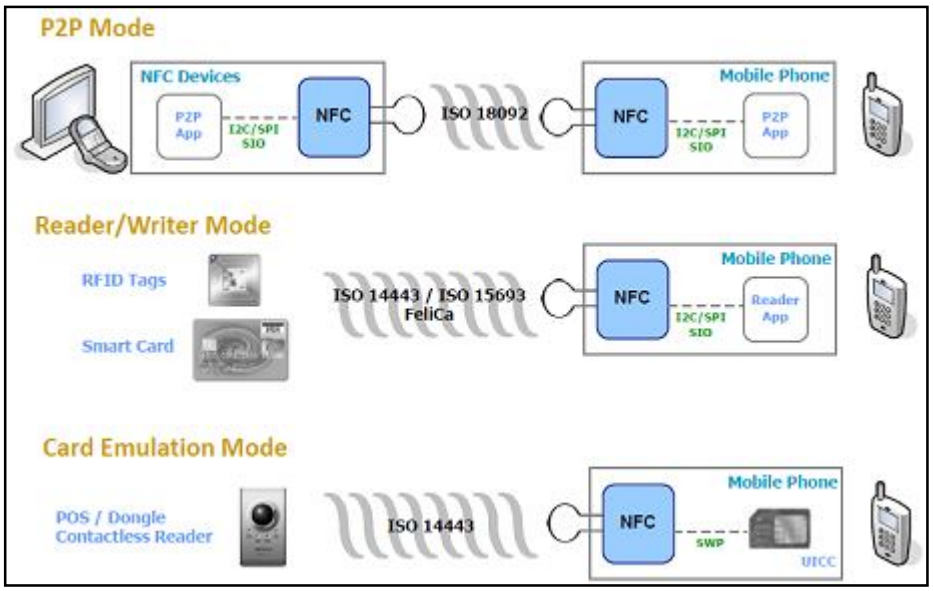

Figure 1: Working modes of NFC

2. Literature Review

NFC identifies us, and our bank account, to a computer. The technology is simple. It's a short-range, low power wireless link evolved from radio-frequency identification (RFID) tech that can transfer small amounts of data between two devices held a few centimeters from each other.

Unlike Bluetooth, no pairing code is needed, and because it's very low power, no battery in the device being read. By tapping your phone on a contactless payment terminal in a shop, train station or coffee shop is able to identify your account and takes payment through an app on your phone.

Passive NFC 'tags' on posters, in shops and on trains could contain a web address, a discount voucher, a map or a bus timetable that passers-by could touch their phones on to receive - or to instantly pay for absolutely anything.

This paper focuses on using NFC for home automation.

An NFC tag can be programmed to carry out simple instructions such as enable switch lights on/off. A device can be kept which contains these tags and are electronically connected to the different circuits which read the signals from NFC tags and operate accordingly.

A simple example could be a led connected to a breadboard which is connected to a logic which receives data from the NFC tag.

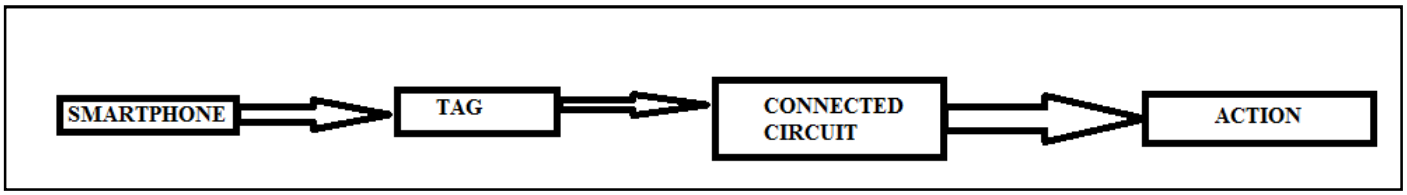

Figure 2: Working of suggested system

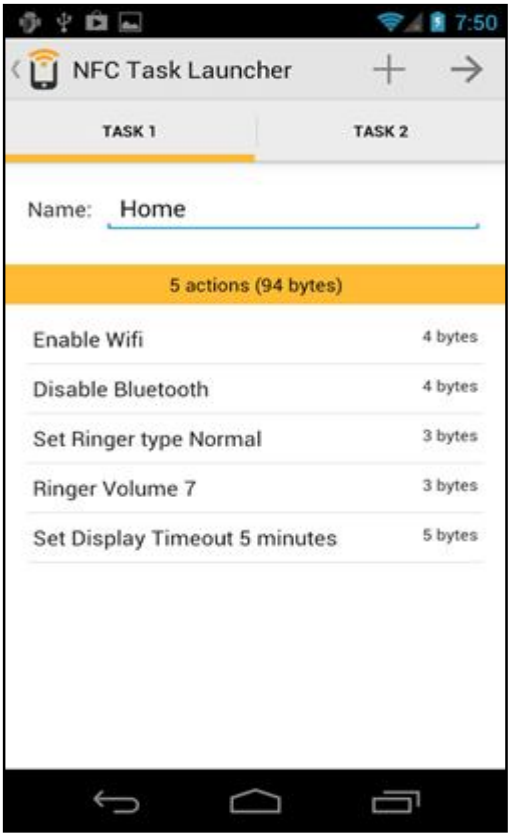

Figure 3: Programming of NFC using NFC Task Launcher

The NFC tags can be purchased and programmed by using many available programming softwares.Some of them are listed as follows. Android users have plenty of apps to choose from for programming NFC tags such as *NFC Task Launcher*, which is very easy to use and has a many options. *TagWriter* is another great app.

- Windows Phone: NFC Launchit, Nokia NFC Writer
- BlackBerry: Smart Tags, NFCShortcuts
- Nokia: Nokia Tag Writer, NFC Interactor

3. Discussion & Conclusion

This paper presents a new approach of the internet of things for home automation. Here the controlling of home appliances can be done by an NFC enabled smartphone by using the NFC technology. Yet much research needs to be done to bring efficiency in the interactions between mobile phones and physical spaces. The NFC tags are not developed as of now to support heavy transactions and transmit high amounts of data. But they can surely be used for making home automation easier by combining it with the internal electronic circuit of the house.

4. References

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