NFC Enabled Human Safety Ring

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Abstract— The report discusses the implementation of Near Field Communication (NFC) [1] as a wireless communication technology between wearable things and mobile phones. The main focus of this report is that the style associate degree application of NFC rings as passive tags for easy and quick interaction between a user with wearable item and NFC enabled sensible phone With the increasing growth and applications of NFC, vendors have embedded NFC tags in numerous things for simple access to users together with key-chains, wallets, pens, stickers and even garments. We are going to examine the utilization of wearable rings as passive NFC tags and discuss thoroughly the planning parameters of NFC antenna utilized in the method. Our study won't solely embrace the analysis of NFC tags in little rounded wearable things like rings however can propose the ways in which during which wireless communication between these wearable things and active tags may be improved once communication is formed at varied angles.
Key words: NFC, Android, Human Safety, Ring, Wearable devices

I. INTRODUCTION

Many unfortunate incidents are going down in our case. issues could come back from any direction like girls or youngsters walking on the road when the work or faculty, reaching to food market or several different reasons that they are going alone. folks reception aren't certain of their belongings come safely. Another issue is lady die while not knowing the explanation as they attend excursions and industrial journeys conducted by the organizations. It happens thanks to attacks on girls however not suicides. These area unit a number of the issues that have taken place within the day to day life. so as to beat such issues moon-faced by US the NFC [1]Safety Ring (Human Security wearable Ring) mobile based mostly application and wearable device isn't solely necessary to use however conjointly plays a important role with humanoid computer code.

The project titled as "NFC Enabled Human Safety wearable Ring for Mobile Devices" may be a humanoid based mostly application. This computer code provides facility for news and job emergency facilitate lines numbers. is used as a security Weapon once we area unit in trouble/distress state of affairs and not even ready to use our hands for job or electronic messaging. The hardware contains a specifically designed NFC RING for creating bit based mostly interactions with sensible phones.

II. PRODUCT CONCEPT

Existing systems or apps in these particular regions have to manually switch on and made interactions for making emergency calls to helpline. Most security applications offer a distress message service. What makes this project different is that you can instantly call record a 45 second voice recording which is sent without your active interaction.

III. HOW NFC SAFETY WEARABLE RING WORKS?

Take your NFC enabled cell phone out of your pocket, slide your hand on the back and the NFC Ring can do functions as declared. It would be easier for emergency situations. The NFC Ring comes with two special NFC tag inlays inside the ring, one for direct calls to ambulance helpline and one for police control lines. Human Safety ring is the best wearable to inform and update your close ones if you are in an unsafe place.

- This project presents an alert system for Human safety detection.
- Send emergency call alert without switching ON the Android app by initiating NFC.
- Medical Alert.
- Emergency Alert.
- Eve Teasing Rescue, Medical Rescue, Fire Rescue, Threat Rescue.
- Can be used as a Safety Weapon when a person is in trouble/distress situation and not even able to use his hands for calling or messaging.
- The system provides a realizable and efficient.
- Application uses Advanced Encryption Standard (AES) algorithm [2]. The application is easier to use by all the woman.
- No charging or electric battery required.

The technology used would be android. This would enable us to develop an android app which can provide read\write access over to the NFC tags which would be embedded into rings.App would be divided into two main screens one for writing the helping numbers on the tag and other functionality will be hardcoded to call the helpline services. The intrusive code written in the android app will make the device to perform action even in emergency situations.

IV. PROPOSED SYSTEM

Existing systems or apps during this specific regions got to manually switched on and created interactions for creating emergency calls to helpline. Most security applications provide a distress message service. What makes this project completely different is that you just will instantly decision record a forty five second voice recording that is distributed while not your active interaction. During this module, the active NFC device scans the passive NFC tags to evidence the coed. This module consists of passive mode of communication so the full image of transferring knowledge to the information comes next to the present stage. during this stage, the NFC tags that has its important info hold on because the encrypted knowledge might later be scan by the reader (NFC enabled phone during this case) to decipher and send the knowledge to the server also store within the

information. this is often the initial module that's to be enforced exploitation NFC tag and a scanner which may read it. This section describes the functions of adding the contactless card to mobile phones that manufacture associate degree intelligent device that permits us to form payments with. This intelligent device is termed a "NFC Mobile Phone". Once completely different functions of a mobile mix with the functions of contact-less cards, the results of this mixture can have a bigger significance than simply the importance of adding two devices along. This significance defines the NFC-enabled mobile which may connect with another NFC-enabled device (i.e. PDA, tablets, etc.) during a short vary communication. NFC technology permits users to learn from new and myriad services on a daily wherever they will pay money for their food; purchase a cinema price ticket by scanning their phone against a picture show poster and far a lot of. This recently developed intelligent device is projected as associate degree all-in-one personal device which will be customized and employed in a extremely interactive setting.

V. ADVANTAGES

A. Convenience

Many customers can "pay" for convenience as a result of convenience is incredibly vital in today's society. NFC could be a excellent source of persuade as a result of it merges a mobile device with wallet(s). NFC is also quite intuitive; all it takes may be a easy bit once victimization NFC for payments. Are you able to imagine what proportion quicker line ups would be at the food market, coffeehouse, etc? [3]

B. Versatility

NFC are often well tailored for every kind of things starting from bank cards to transit passes, flick passes, reward systems and even keys. Ideally, NFC is fitted to a broad vary of industries and uses as a result of this innovation permits users to control through the event of softwares. [3]

C. Safety

Now, you would possibly assume however fusing your pocketbook into your mobile device may be safer. After all, rather like a pocketbook, a radiophone may be purloined. But once your pocketbook is purloined, the malefactor has access to all or any your credit cards and knowledge right away! With good phones, passwords is accustomed more shield your info. [3][4][7]

VI. DISADVANTAGES

A. Company Agreements to use NFC

Many people who would like to try out NFC needs that it are used everyplace and anyplace. but if corporations don't conform to integrate NFC into their business, customers won't be ready to use the technology. NFC users won't be ready to use reward/point card system at their favorite coffee bar, make-up department or at the other distributer. [3]

B. Security

Another major risk to NFC is pc hacking or phone hacking. As mobile phones become a lot of developed, they become very like a handheld pc, and like computers, they become susceptible to viruses. Hackers can need to realize access to those little computers as a result of it contains plenty of necessary info bushed one device. Examples embody a phone's owner MasterCard info, bill payments, social insurance info, etc. Moreover, as technology advances, it'll become easier for hackers to try to to this. it's calculable that the majority governments might take up to ten years to finally heat up to close Field Communication technology.[4][7]

VII. TECHNOLOGY MODULES USED

A. Platform: Android.

Android could also be a mobile OS developed by Google, supported the Linux kernel and designed primarily for bit screen mobile devices like smart phones, to control on-screen objects, beside a virtual keyboard for text input. to boot to the bit screen devices, Google has additional developed automaton TV for televisions, automaton car for cars, and automaton Wear for articulation plane watches, each with a specialised program.[5] Variants of automaton also are used on notebooks, game consoles, digital cameras, and different physical science. automaton has the most important put in base of all in operation systems (OS) of any kind. automaton has been the bestselling OS on tablets since 2013, and on good phones it's dominant by any metric. at the start developed by automaton, Inc., that Google bought in 2005, automaton was disclosed in 2007 beside the innovation of the Open phone Alliance – a syndicate of hardware, software, and telecommunication corporations dedicated to advancing open standards for mobile devices. As of Gregorian calendar month 2013, the Google Play store has had over one thousand thousand automaton applications ("apps") written – along with many "business-class apps" that rival contestant mobile platforms – and over 50000000000 are applications downloaded. Associate in Nursing April–May 2013 survey of mobile application developers found that seventy one amongst developers turn out applications for automaton, and a 2015 survey found that 400thof standard consummate developers see automaton as their priority target platform, that's paying homage to Apple's iOS on thirty seventh with every platforms means on high of others. In Sept 2015, automaton had one.4 billion monthly active devices. Android's ASCII text file is discharged by Google below open supply licenses, though most automaton devices ultimately ship with a mix of open supply and proprietary software package, together with proprietary software package needed for accessing Google services. [5] automaton is popular technology corporations that need a ready-made, cheap and customizable OS for classy devices. Its open nature has impressed associate degree outsized community of developers and enthusiasts to use the computer code computer file code as a foundation for community-driven comes, that deliver updates to older devices, add new choices for advanced users or bring automaton to devices originally shipped with totally different operational systems.

The success of automaton has created it a target for patent (and copyright) judicial proceeding as a part of the alleged "Smartphone wars" between technology corporations. [5]

B. Technology: Advanced NFC

This document describes advanced nfc [1] topics, like operating with numerous tag technologies, writing to nfc tags, and foreground dispatching, that permits an application within the foreground to handle intents even once alternative applications filter for constant ones. near-field communication (nfc) could be a set of communication protocols that alter two electronic devices, one in all that is typically a conveyable device like a smartphone, to ascertain communication by transportation them inside 4 cm (1.57 inch) of every alternative. nfc devices square measure utilized in contactless payment systems, just like those utilized in credit cards and electronic price tag smartcards and permit mobile payment to replace/supplement these systems. NFC is employed for social networking, for sharing contacts, photos, videos or files. nfc-enabled devices will act as electronic identity documents and keycards. nfc offers a low-speed reference to easy setup which will be accustomed bootstrap additional capable wireless connections.[8]

C. Android framework APIs that support these features

Android provides an upscale application framework that permits you to create innovative apps and games for mobile devices in a very Java language surroundings. The documents listed within the left navigation offer details regarding the way to build apps victimization Android's varied arthropod genus.

D. Hardware: High Capacity NFC Adhesive Tags

NFC stands for close to Field Communication - a kind of short-range radio communication supported RFID standards within which a association is established by delivery 2 devices into shut proximity.NFC encompasses a variety of of uses together with contactless payment/transaction systems (Google wallet [6], TFL's Oyster et al), employee/ID systems, information transfer between devices (Android Beam) and simplified association of alternative types of wireless communication (Bluetooth, Wi-Fi etc). Additionally to those uses, NFC permits for little, passive (i.e. un-powered) 'tags' to be scan from and written to by active (powered) NFC devices - with the facility the tag needs being drawn from the active device. it's these tags that area unit lined within the section below.[8]

VIII. MODELS OF NFC CHIP [10]

Name	Available memory	URL length	Text length	NFC Class
Topaz	96 bytes			Type 1
NTAG216	888 bytes	854 characters	852 characters	Type 2
DESFire EV1 8k	8192 bytes			Type 4
Topaz 512	512 bytes	453 characters	447 characters	Type 1
NTAG215	504 bytes	492 characters	490 characters	Type 2
Ultra-light	48 bytes	41	39	Type 2
(UL)		characters	characters	
DESFire EV1 4k	4096 bytes			Type 4
Sony FeliCa 4K	4096 bytes			Type 3
ICODE SLIX-L	32 bytes	24 characters	22 characters	Type 5
ICODE SLIX 2	316 bytes	308 characters	306 characters	Type 5
Sony FeliCa Lite	224 bytes			Type 3
DESFire EV1 2k	2048 bytes			Type 4
ICODE SLIX-S	160 bytes	148 characters	146 characters	Type 5
Ultralight C (ULC)	148 bytes	132 characters	130 characters	Type 2
NTAG203	144 bytes	132 characters	130 characters	Type 2
NTAG213	144 bytes	132 characters	130 characters	Type 2
NTAG212	128 bytes	122 characters	120 characters	Type 2
ICODE SLIX	112 bytes	102 characters	100 characters	Type 5
Fudan F08	1024 bytes			
MiFare 1K	1024 bytes	256 characters	709 characters	Classic[1]

Table 1:

IX. MANUFACTURING PROCESS AND TECHNOLOGY

Android NFC technology [9] grew well in scope since its golem debut in 2010, on the Nexus S. If your phone possesses NFC technology, you'll be able to currently move with a large range of NFC "tags". A tag may be a radio sensitive chip, that contains info that may be scan and written to by a NFC-capable mobile device. You simply ought to faucet the NFC attach the rear of your phone to activate it. though most tags unremarkably launch websites or show information, their use usually depends on the context.

Differing forms and technologies: NFC tags will seem in an exceedingly type of differing forms, from key chains to credit cards.

We have a tendency to like victimization NFC stickers that contain the essential electronic equipment required, additionally to AN adhesive facet.

Unfortunately, the market is stricken by competitive NFC tag technologies. as an example, the Nexus four supports the NTAG230 NFC normal, whereas the bulk of devices (but not all) uses the MIFARE Classic 1K tags.[10]

The major NFC technologies out there right now are:
- MIFARE Classic 1K: The most common NFC tag technology.
- NTAG230: Found on the Nexus 4 and Nexus 10 devices.[9]

Aside from the two standards listed on top of, several different tag formats exist, with varied degrees of cross-compatibility. Nearly all NFC tags are scan by NFC-enabled devices however some cannot be written to.

X. MARKET

The near field communication (NFC) market is predicted to succeed in USD twenty one.84 Billion by 2020, at a CAGR of seventeen.1% between 2015 and 2020.The data transfer includes money transactions, device management, and lots of different applications. Report market covers the foremost segments specifically in operation modes (peer-to-peer, card emulation, and reader emulation), product & software package, application business, and region. Our product emerges to be AN middle ware application device in between these market segments. [10]

XI. COST OF PRODUCT

The complete cost of manufacturing the product is minimal as the major investments lie into purchasing the below mentioned nfc tags which are available in market at a stocked price of 2000rs for at most 20 pieces. We make use of ceramic material for the ring or involvement of 3d printers for more fabricated materials will cut down the cost. Embedded Chip : ntag203

- Memory : 168 Bytes (144 bytes available for user)
- Size : 30 mm, Antenna size : 25 mm

Which makes the ring cost cut down to a minimum of Six hundred rupees only as in Indian markets .

XII. PRODUCT PROFITABILITY

Product gain service providing helps purchasers' style their merchandise for maximized client and end user price, whereas maintaining price effectiveness within the delivery of that price. Product gain cannot merely be regarding price reduction. we tend to believe that vital enhancements in product gain, whether or not from evaluation or margin improvement, should begin by capturing real insights into customers and markets, then understanding, targeting, and delivering the proper "value combine." a comprehensive specialize in each top-line and bottom-line levers helps improve product fight and drive accumulated gain.

XIII. CONCLUSION

NFC rings acts as a true friend who will help a person in every distress condition either regarding safety or crucial physical conditions. Today in India the number of rape cases, human trafficking cases, and road accidents are increasing day by day where we could use our ring as a safety weapon. India is a developing country were security is one of the most important factor where sometimes police don't assure that level of safety to us then "NFC Enabled Human Safety Wearable Ring for Mobile Devices".

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