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A SMART ID CARD WITH M-LEARNING APPROACH FOR CHILD SECURITY

Sayali V. Tinkhede[1], Hitesh A. Atkare[2], Aamir H. Khan[3], Aihtesham N. Kazi[4]

[1]Student,C.S.E.Dept, J.D.I.E.T.Yavatmal, Maharashtra, India,*tinkhede18@gmail.com*

[2] Student,C.S.E.Dept, J.D.I.E.T.Yavatmal, Maharashtra, India,*hiteshatkare1@gmail.com*

[3] Student,C.S.E.Dept, J.D.I.E.T.Yavatmal, Maharashtra, India,*mr.aamirkhan111@gmail.com*

[4]Asst.Prof.C.S.E.Dept, J.D.I.E.T.Yavatmal, Maharashtra, India, *kazi_aihtesham@rediffmail.com*

Abstract

Now a day human crime is increasing a lot and has a lot impact on the society. As per the report of Human Rights commission of India over 40,000 children are reported missing every year of which 11000 are untraced. Traffickers often find pray as children because not only children are vulnerable than adults, but there is a high market demand for young victims, and generally track the child those who are school going. This paper represent a small initiative to reduce child trafficking by providing a child safety system. Apart from child security, as a Parent we have to consider and contribute in child education too. There is a small amount of gap between Parent-Child-Education-Teacher. The focus of this paper is to deploy security system in hot spots like School, Home and Tuition Centre etc. The system comprise of RFID/NFC communication enabled smart ID card and a Child Safety device (CSD). The CSD is the combination of most commonly used technologies like GPS and RFID. It is a combination of web portal and Android based mobile application provides the information about the student to parents and teachers with the help of CSD and smart Id cards. Mobile app and Web portal helps teachers convey the performance of a student in his/her class, it helps parents to monitor and guide child to achieve goals.

Keywords: child safety, security, mobility device, Education, parents-teachers communication, RFID, NFC, GPS, QR-code.

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I. INTRODUCTION

Newly Invented technologies have provided us advancement in the mobility devices. The devices are very useful to track and monitor the child. Low cost system does not provides that service and facility. If we want that system should provide high amount of facility and should have low price the CSD fulfil this gap. The CSD is constructed over the II tier architecture. It provides the fail proof message sending it also uses the GPS system to track the location of the child. The RFID/NFC is used the RFID tag is fitted in their Smart Id Card. The places where the CSD system is not used there the use of QR-Code is done. The latest safety support system for children on school routes with the help of an Ad-hoc network constructed from mobile phones with the Bluetooth function. The CSD serves the society for Child security and helps the parents to get information in one touch using mobile app and web portal. The system helps to bridge between the child and parents with timely updates on Child location, tracking and safe zone messages.

II.WHAT IS SMART ID CARD?

Using a biometric devices like fingerprint authentication, Retina, password protection are most commonly used technologies but in this paper we mainly focusing on school going child. The card contains information of the student and the information which is highly confidential is kept in the form of QR-Code. Schools provide Smart ID card, the card is enabled with Radio Frequency Identification Device chips in it. Tagging school children with RFID chips is uncommon, but not new. In this proposed Smart ID, along with RFID/NFC there is printed unique QR code too. QR code helps in the places where our CSD is not implemented.

A. Cards main features

1. Advanced Biometric Identity for children.
2. Card will have children photo.
3. Complete Address
4. Education Details
5. Blood group

Fig-1: A smart ID card sample

B. Technologies used in smart ID card

- **RFIDTechnology**

Radio Frequency Identification known as RFID is term of technologies that use radio to automatically identify people or object. It is a small electronic devices that consist of small chip and an antenna .The chip typically a capable of carrying 2000 bytes of data or less the RFID provides a unique identifier for that

object.As RFID technology enables to automatically identify each item by using radio waves and it replaces 'bar code' technology because of its contact-less recognition , batch processing of data and reusability of information contact-less recognition between RFID tag and reader provides much flexibility and RFID technology gives longer recognition range that another such as bar code smart cards.

An RFID system is made up of three main components 1.An Antenna or coil 2.A Transceiver and 3.An RFID Tag. The antenna transmits radio signal to activate the tag so the data could be read or written. Data storage and retrieval purposes are carried out using special devices, the RFID tag. The tag is very small in size and can be placed anywhere on anything or inserted in human body.

- **QR -Code**

The QR-Code is the quick response code.The 1D barcode was designed because it can contain more information compared to other. It was firstly invented in the automotive industry in japan. Later it become more popular because of itsfast readability and greater storage capacity. The smallest QR-Code is of size 21x21 module is called as Version1 QR-Code. Largest code is of size 177x177 module is called as Version 40 QR-Code.There are four levels of error correction for QR-Code: L, M, Q, H. The lowest is level L which allows the code to be read even if 7% of it is unreadable. The another level is M which provides 15%, then level Q which provides 25% and then level H which provides 30% error correction. When the CSDis not available at that time QR-Code can be used.

Fig- 2: QR Code

III. WORKING OF SMART ID CARD

Fig-3: System Architecture

The objective of this paper is to bridge the gap between Parents-Child and Teachers in ensuring Security. Smart Id will be provided to the child by mapping the unique identification. The parents and teachers can download the android application and install it in their smart phone. The child sign process will be done by the management using web portal. Once these set-up are done. Parents can view their child attendance report using the mobile application. Teachers and parents can chat and send buzz between themselves about child location and activities.

Let consider a situation child missing, In case of child not found in the appropriate hotspot on certain time period, CSD will invoke a buzz to intimate the student absence to parents, guardians and teachers. The Buzz contains the message of saying from where it is triggered and information about the child name and other profile details. If suppose, a child is found in streets normally peoples will inform the school or police station with the information provided in the school ID card. In case the ID card is Smart id any unknown person can scan the QR code or tap the card on mobile if it is NFC enabled mobile. Once it is done, Link of downloading our child safety app will be displayed to the unknown person. After installing the application just by tapping the card or scanning the card fetches the GPS location and other basic information's form the device to parent's teachers and guardians.

IV. M-LEARNING

In this paper, M-Learning refers to mobile learning. By using mobile we will secure child with the help of Ad-hoc network.

- **Ad-hoc Network**

Ad-hoc network is the temporary network, if the child is within the range then he/she is connected otherwise disconnected. There are three main components of Ad-hoc network in this system:
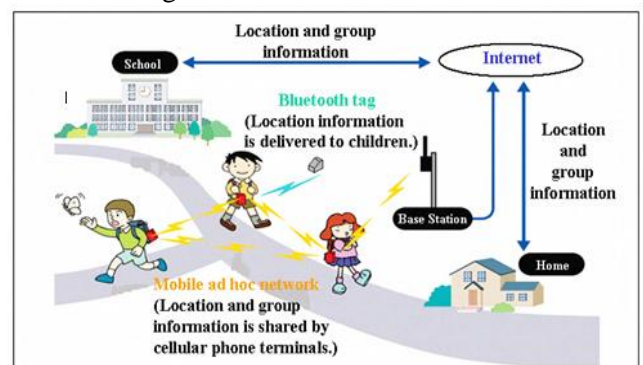
1. Children
2. Volunteers
3. Bluetooth Tags

Fig-4: Outline of safety support system for children on school route

In this paper we present an outline of the new safety support system for children on school routes using an Ad-hoc network constructed from mobile phones with the Bluetooth function. The structure of the safety support system is intended to support volunteers who are involved in managing the safety of the localcommunity, since a healthy local community is

the strongestdefense against crimes. Each parent can check not only the passage history of his/her child but also check the number of the other children in the vicinity of his/her child.Bluetooth tags are fitted on electric poles and waiting to be discovered by mobile phones. Both the children and volunteers have mobile phones with Bluetooth. The safety support system application is installed on the mobile phones. After discovering the tags, mobile phones form groups and one of the mobile phones represents the group. The volunteer sends the Bluetooth MAC address that is the hardware address of the discovered tag and the mobile phone of the group member to the server of the safety support system through the mobile phone cellular network.

The server receives information from the representative of the ad-hoc group, saves, and then analyzes the information. Parents, teachers, and volunteers can access the server by apps to determine the current status of each child. In the event of an emergency, the server sends a warning to the volunteers, parents, teachers, but also reduces the burden on the volunteers. The outline of this system is displayed in fig 4. In this paper, we present an outline of this safety support system for children. Grouping using a mobile ad-hoc network is key technology.

There are two constituent to be developed to construct an ad-hoc network for the safety support system for school going children, one is to set up Bluetooth tags on the school route and the other is an ad-hoc network construction.

- **Bluetooth tags on the school route:**

They have set up Bluetooth tags with a solar battery on electric poles or traffic signposts as displayed in Fig 5.The specifications allow driving Bluetooth tags without stopping if there is too sunny days, since it has a huge battery and its capacity is enough to provide power to Bluetooth chip for a week.

Fig-5: Bluetooth tags with solar battery on traffic signpost

- **How the children bring a mobile phone**

Fig-6 displays a mobile phone stored in a black poach and hooked to the school bag. The application for the safety support system works if the flap is closed if it is not properly hooked or closed then it won't work. The necessity for this safety support system is to see that children walk on the given school route to increase

safety by monitoring the passage of tags on the already defined route.

Fig-6: Mobile phone hocked on school bag

V.GPS (GLOBAL POSITIONING SYSTEM)

GPS is a multiple satellite based radio positioning system in which each GPS satellite transmits data that allows user to accurately measure the distance from the selected satellite to his antenna and to calculate position, velocity and time parameters to high degree of accuracy. GPS delivers with high sensitivity and accuracy with low power consumption.

A GPS tracking system, for example, may be placed, on a cell phone, or on special GPS devices, which can either be a fixed or portable unit. GPS works by providing essential information on exact location. It can also track the movement of a person. So, for example, a GPS tracking system can be used by parents to check on the location of their child. If a child is misplaced or snatched he or she has a better chance of being found. There is a difficulty to use GPS for safety support system on school routes or roads. GPS needs access to base stations however, the scope of base stations cannot accept huge numbers of accesses from children on the school route. Therefore the volunteers are assigned to monitor the group of children.

- **ADVANTAGES**
1. Life of a smart card is longer.
2. Data on a smart card can be protected against unauthorized viewing.
3. Safe to Transport.
4. Double as an ID card.
5. Provides child security.
6. Paper free attendance.
- **DISADVANTAGES**
   1. Can be expensive.
   2. Slow Adoption.
   3.Easily Lost/Stolen.

VI. CONCLUSION:

In this paper, we described that a child security system is used to secure the child. In order to solve the problem faced by the small children. Parents are so busy that they don't have time to look after their child because of their job/work. This method of securing child through smart ID card and by using Ad-hoc network can really help them to secure the children.They have also used the GPS system to get the exact location of the child. A platform is laid to

bridge the gap between parents-teachers-students.Utilizing the mobile technologies to parents contributing in child education. Which helps the parents to better understanding of child education too. The system helps in capturing the learning activity of a student which helps in providing a better support and guidance from parents and teachers.

REFERENCES

[1]. Vinod Rengaraj, Prof. Kamal Bijlani, "A Study and Implementation of Smart ID Card with M-Learning and Child Security" in Applied and Theoretical Computing and Communication Technology (iCATccT), 2nd International Conference on, vol., no., pp.305-311, 2016

[2]. Zejun Huang; ZhigangGao; Huijuan Lu; Jiancheng Zhang; Zuoqi Feng; Haixia Xia, "An Mobile Safety Monitoring System for Children," in Mobile Ad-hoc and Sensor Networks (MSN), 2014 10th International Conference on , vol., no., pp.323-328, 19-21 Dec. 2014

[3]. Deenadayalan, C.; Murali, M.; Baanupriya, L.R., "Implementing prototype model for School Security System (SSS) using RFID," in Computing Communication & Networking Technologies (ICCCNT), 2012 Third International Conference on , vol., no., pp.1-6, 26-28 July 2012

[4]. Atsushi Ito, Yoshiaki Kakuda, TomoyukiOhta and Shinji Inoue, "New safety support system for children on school routes using mobile adhoc networks", IEICE Transactions on Communications, vol.E94-B, no.1, 2011, to appear.

[5]. Eitaro Kohno, TomoyukiOhta ,Yoshiaki KAKUDA ,Shinji Inoue and yusuke Akiyama, "Performance Improvement of Hiroshima city children tracking system by correction of wrong registrations on school routes" Proc. 9th IEEE International Symposium in Autonomous Decentralized Systems (ISADS 2009), Athens, Greece, pp.261-265, 2009