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Survey on Prevention of Infant Abduction in Hospitals

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ABSTRACT

This paper discusses the concept of a smart wearable device for babies. In hospitals and birth centers, there are number of threats to the new born babies like infant abduction. Mobile devices (such as, smart-phones or tablets) are used to process the sensed data and monitoring a baby performing alerts/warnings when an abnormal situation is detected. To overcome these issues, the proposed project prevents infant abduction in hospitals by the techniques of RF-ID product code scanning technique.

Keywords : loT, UPC (Universal Product Code), Arduino UNO, security, Wearable.

I. INTRODUCTION

The Internet of Things System (loT) refers to the set of devices and systems that stay interconnected with real-world sensors and actuators to the Internet. loT includes many different systems like smart cars, wearable devices and even human implanted devices, home automation systems and lighting controls[1]; smartphones which are increasingly being used to measure the world around them.Infant tracking with RFID is becoming more and more common as hospitals in today's competitive environment realize the benefits. Ankle bracelets with RFID tags can be attached to infants shortly after birth. This way, the RFID tags can verify babies' locations and send off warning Signals when the babies are somewhere other than in the Nursery [2]. Tracking and identification in healthcare are widely suggested as a "killer application" for the radio-frequency identification (RFID) technology. Safety for in-patients is empowered by letting hospital staff know exactly the location of every patient inside the hospital[4]. In this context, WBAN supporting healthcare applications can offer valuable contributions to improve patient healthcare, including diagnosis and/or therapeutics monitoring. In a short time, WBAN technology has taken its first steps in the medical rehabilitation and monitoring of patients[5]. This paper proposes a system that avoids those risks. The proposed system monitors the In time and Out time of every child and it allows only authenticated persons inside it. And then, it sends In time and Out time information of every child to the database, from which it sends an alert message to the parents of a child[6].Several technologies or strategies have been proposed to detect and locate the RFID tags[7] and send data to the server[8].

II. FEATURES OF IOT

1) AI: IoT essentially makes virtually anything "smart" meaning it enhances every aspect of life with the power of data collection, artificial intelligence algorithms, and networks.
2) Connectivity: New enabling technologies for networking. IoT creates these small networks between its system devices.
3) Sensors : IoT loses its distinction without sensors. They act as defining instruments which transform IoT from a standard passive

network of devices into an active system capable of real-world integration.

4) Active Engagement: Much of today's interaction with connected technology happens through passive engagement.
5) Small Devices: Devices, as predicted, have become smaller, cheaper, and more powerful over time.

III. LITERATURE REVIEW

Akash Moodbidri et al.[1] The child safety wearable device is capable of acting as a smart loT device. It provides parents with the real-time location, surrounding temperature, UV radiation index and SOS light along with Distress alarm buzzer for their child'ssurroundings and the ability to locate their child or alert bystanders in acting to rescue or comfort the child.

Kaiyan, Wang et al.[2] This system successfully merges the technologies of RFID and Web-based database systems. The RFID tag provides a secure and robust method for holding the infants' identifier. The Web-based database system allows for the centralized management of all infant records.

Kim Young-Chan Kim et al.[3] This pilot project helped us to successfully perform the electronics Integrated control service industry and the Ministry of Knowledge Economy. The project include maintenance of the installed system costs borne by local governments based on a difficult financial situation.

Guido Biffi Gentili et al.[4] Shows the Patient safety and clinical risk issues can take advantage of the proposed RFID system in order to answer to initial aims, improve medical performances, and achieve a system ready to optimize children's ICU wards and improve healthcare performances.

Luis Filipe et al.[5] This paper presents WBANs for healthcare applications, as well as some standards used with better results for this type of network. The purpose of our study was to identify and select existing technologies and protocols that satisfy the main requisites of WBANs for medical purposes.

Amruta M. Sanam et al.[6] The proposed system can be efficiently used for school children transportation safety purpose. It avoids the unauthenticated person to enter inside the bus hence; it prevents the bus from being hijacked. It provides some kind of relief to the parents of children regarding safety of their children during transportation to or from the school.

Clément Crémoux et al.[7] The study aims to discuss about the impact of the immersion of a RFID tag dedicated to an anti- kidnapping application. These systems based on different technologies have to be reliable in any event, A stochastic method is the best approach to study the influence of the immersion of the tag.

Riad Kanan et al.[8] The proposed system was designed to easily integrate into a clinical environment, operate in real time, and facilitate following the hygiene workflows without hindering the normal clinical activity. In order to add convenience and comfort to the hospital staff, we are targeting to reduce the form factor of the wearable device.

Wei Lin et al[9] Presenting Wi-Fi as the wireless technology for the device was based on the application environment that the device is usually used at home or in nurseries and hospitals where Wi-Fi coverage is available. Wi- Fi can readily integrate the device into cloud service to form a scalable monitoring system without the need of a bridge device.

Ângelo M. Fonseca et al.[10] The system proposes in the paper tries to offer a reliable solution for SIDS prevention. It was designed to bring comfort and a better living for parents,nannies, and babies.So parents are more rested because this system protects

the baby. The solution is based on wireless sensor networks connected to a mobile device through Bluetooth that act as a sync.

IV. COMPARATIVE STUDY

RESEARCH PAPER	ALGORITHM	DESCRIPTION	LIMITATIONS
Infant management system based on RFID and internet technologies.	Radio Frequency Identification (RFID) technology has been widely accepted in hospitals to track and locate new born babies. This paper proposes a Web-based management system based on RFID tagging system.	1.Improved infant care and safety, reduced systems and human-based errors . 2. Enabled fast sharing of medical information with the clinical staff and families.	1. No much memory in an RFID transponder. 2. EHR cause Financial issues, including adoption and implementation costs, ongoing maintenance costs and present a disincentive for hospitals. 3 EHRs may cause several unintended consequences like medical errors, negative emotions, etc,.
A child safety and growth management system.	Nowadays, most of the parents entrust their children to kindergarten or preschool child's growth, education, and has commissioned. Thus, children in the park in order to maintain a safe and healthy life, safety and growth of children by building	1Temperature sensors. 2.Monitors the health of the children. 3. Humidity measurement. 4.Cameras used	1.Sensors and devices and the server took too costly to build. 2.Installation malfunctions and bugs in the initial operation.

	management systems with their parents and their teachers comfortably and safely establish a system to manage children .		
Dual frequency active RFID solution for tracking patients in a childrens hospitals.	Tracking and identification in healthcare are widely suggested as a “killer application” for the radio-frequency	1.Radio frequency identification is used. 2.Tracking locations. 3.Active RFID tags.	1. The tag antenna is a critical factor in this context because it is the weak point in the data and energy transmiss

	identification (RFID) technology.		ion. 2. A poorly designed tag reduces the available power to operate . 3. Causes high

Wirless Body Area Networks for HealthcareApplications: Protocol Stack Review	It uses a new method of gestures of body segments to estimate the knee joint angle and identify gait cycles.	Star and many-to-one communication are the topologies most frequently used	1.It send data and are not involved with data forwading. 2.Time consuming.
Safety system for school children transportation	The proposed system monitors the In time and Out time of every child and it allows only authenticated persons inside the bus. It sends In time and Out time information of every child to the school database, from which it sends an alert message to the parents of a child.	1.Safety system 2.Traffic Engineering computer 3.Authentication person. 4. Out time monitoring. 5. In time monitoring.	1. wide scale implementation cost is high and also children could not carry the child module appropriately. 2.It is not convenient for the children to place their palms correctly on the scanner and hence the accuracy of the system may go down
Reliability of active RFID tag immersed in water for "preventing infant abduction" application.	To prevent infant abduction, technology based on RFID is a growing application. To control where and when infant is in the maternity ward, RFID tags are attached to infant's ankle and are identified and located	To control where and when infant is in the maternity ward, RFID tags are attached to infant's ankle and are identified and located by stations installed in the building.	1. Propagation losses 2. Statistical distributions

	by stations installed in the building.		
An autonomous system for hospital-acquired infections (HAIs) prevention-Riad Kanan	The spread of nosocomial infections within hospital environment.A wearable device for hospital staff and a main unit ensuring coverage for all bed's surroundings have been designed. It consists of a radio transceiver alarm actuator	1.Alarm Systems 2.Biomedical Communication 3.Information Retrieval Systems 4.Low-power Electronics	Counted among the leading causes of preventable death
Wireless Infant Monitoring Device for the prevention of sudden infant death syndrome	A wireless Infant Monitoring Device has been developed as a preventive measure against sudden infant death Syndrome. It measures the sleep position, respiratory rate and body temperature of an infant as well as its surrounding carbon Monoxide concentration. Those data are considered as the risk Factors of the sudden infant	1.Medical Disorders Paediatrics 2.Pneumodynamics 3.Position Measurement 4.Telemedicine5. Temperature Measurement	Detect those risks and warn parents and caregiver

	death syndrome.		
A sudden infant death prevention system for babies	The sudden infant death syndrome (SIDS) is an expert diagnosis when an apparently healthy baby dies without Explanation. When physicians or coroners cannot explain the Cause of death it is classified as sudden death. This paper reviews the related literature and	1.Abnormal situation 2.Sudden infant death 3.prevention system 4.Sudden infant death syndrome	Data processing using a combination of multiple sensors

	proposes a mobile solution based on biofeedback monitoring that tries to prevent the sudden death in Infants.		
A non-invasive and remoteinfant monitoring system using CO2 sensors	Infant monitoring system using CO2 sensors to non-invasively monitor the exhaled air from an infant in order to reduce the potential risks for Sudden Infant Death Syndrome (SIDS). Due to the	The infant's ability to sleep for sustained periods might not be physiologically advantageous.	The infant is not held in the upright position when not sleeping.

	variation in the exhaled CO2 concentration, we can detect problematic episodes associated with infant's respiration.		
UWB Baby Monitor	This article considers high tech UWB solutions for one of the most important up-to-date challenges opportune diagnostics of obstructive sleep disorders also known as sleep apnea, primarily for babies, which often cause sudden infant death syndrome (SIDS) to occur. Sleep apnea is a sleep disorder characterized by pauses in breathing during sleep. The	The device informs supervisor about baby's condition and alarms when it observes dangerous abnormal parameter value preventing from SIDS occurring.	Drawback of such systems is that the sensor tip must always be in contact with the skin which may disturb and irritate the baby.

V. PROPOSED WORK

This project proposes a system that tries to predict and detect situations that evaluate the risk of a baby and alert those are responsible by her/him or even competent authorities. The proposed system prevents infant abduction in hospitals by the UPC (Universal Product Code) scanning technique. This system include a tag which comprises of a sound sensor and the Bar code If a kidnapper tries to abduct the child, the sensor produces an alarm to the parents and administration.Only after releasing the band by the UPC generator, the child can be taken out of the hospital premises In case of any fraudulence, like cutting the band, the sensor produces an alarm to parents and administrator. The system emits an alert,

in real time, so nannies can react immediately, check the baby state, and intervene if needed.

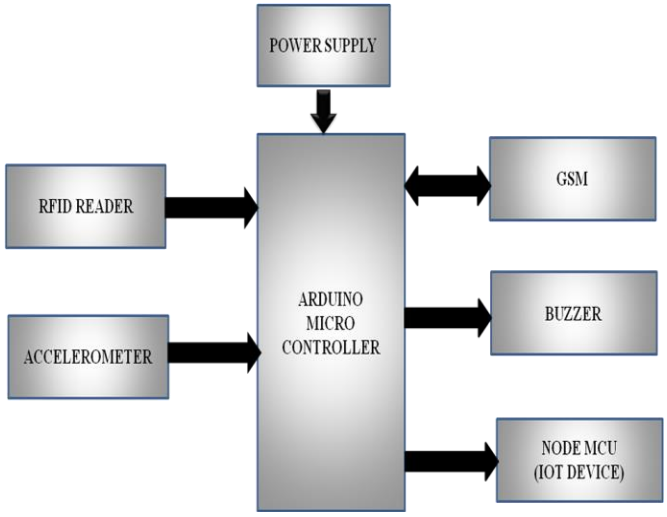

Figure 5 : System overview

VI. CONCLUSION

Cloud computing was one of the emerging techniques today but it has problems related to its security i.e., it has lots of security issues. In this paper, we proposed a new framework which provides the security on the data. Eventhough some approaches are helpful in securing the cloud data, they are suffered from having more number of keys and attacks like collision attacks. In our proposed framework we use Honey Encryption to solve the security issues in cloud data. The number of keys and security attacks are also reduced by the proposed framework.

VII. REFERENCES

[1]. Bradley B. Randall David S. Paterson Elisabeth A. Haas Kevin G. Broadbelt Jhodie R. Duncan Othon J. Mena Henry F. Krous Felicia L. Trachtenberg and Hannah C. Kinne Potential Asphyxia and Brainstem Abnormalities in SudDen and Unexpected Death in Infants in Pediatrics 11 November 2013.

[2]. SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleepeing Environment in Pediatrics Vol. 5 pp. 1030-1039 1 November 2011 DOI: 10.1542/PEDS.2011-2284.

[3]. Joao M. P. L. Caldeira and Joel J. P. C. Rodrigues Body Area Networks for Healthcare in McGraw-Hill Yearbook of Science and Technology 2014 McGraw-Hill USA ISBN: 978-0-07183-106-2 January 2014 pp. 47-50.

[4]. Ziganshin E.G. Numerov M. A. Vigolov S. A. "UWB Baby Monitor" 5th International Conference Ultrawideband and Ultrashort Impulse signals (UWBUSIS 2010) September 6-10 2010 pp. 159-161 DOI: 10.1109/UWBUSIS.2010.

[5]. Hung Cao Lun-Chen Hsu Thermpon. Ativanichayaphong Jeongsik Sin and J. C. Chiao "A non-invasive and remote infant monitoring system using CO2 sensors" 2007 IEEE Sensors October 28-31 2010 pp. 989-992 DOI: 10.1109/ICSENS.2007.438857.

[6]. Hung Cao Lun-Chen Hsu Thermpon. Ativanichayaphong Jeongsik Sin Harry E. Stephanou and J. C. Chiao "An Infant Monitoring System Using CO2 Sensors" IEEE International Conference RFID 2007 March 26-28 2007 pp. 134-140 DOI: 10.1109/RFID.2007.346161.

[7]. H. Moustafa, H. Kenn, K. Sayrafian, W. Scanlon and Y.Zhang, "Mobile wearable communications [Guest Editorial]," in

[8]. IEEE Wireless Communications, vol. 22, no. 1, pp. lO-l1,February 2015.

[9]. K. Braam, Tsung-Ching Huang, Chin-Hui Chen, E.Montgomery, S. Vo and R. Beausoleil, "Wristband Vital: A wearable multi-sensor microsystem for real-time assistance via low-power Bluetooth link," Internet of Things (WF-IoT), 2015 IEEE 2nd World Forwn on, Milan, 2015, pp. 87-9l. doi: 10.l109/WF-IoT.2015.7389032.

[10]. Kahn A, Groswasser J, Sottiaux M, RebuffatE, Franco P, Dramaix M. Prone or supinebody position and sleep characteristics ininfants. Pediatrics. 1993;91(6):1112–1115.

[11]. National Infant Sleep Position Study [home bu.edu/ChimeNisp/Main_Nisp.asp. Ac- cessed April 5, 2011 page]. Available at: http://dccwww.bumc.