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Integrating Blockchain for Data Sharing and Collaboration in Mobile Healthcare Applications

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ABSTRACT

Empowered by portable and wearable innovation, individual wellbeing information conveys tremendous and expanding an incentive for human services, profiting both consideration suppliers and medicinal research. The protected and advantageous sharing of individual wellbeing information is urgent to the improvement of the connection and joint effort of the social insurance industry. Looked with the potential security issues and vulnerabilities existing in current individual wellbeing information stockpiling and sharing frameworks, just as the idea of self-sovereign information proprietorship, we propose a creative client driven wellbeing information sharing arrangement by using a decentralized and permissioned square chain to ensure protection utilizing channel development plan and upgrade the personality the board utilizing the participation administration upheld by the blockchain. A portable application is sent to gather wellbeing information from individual wearable gadgets, manual information, and therapeutic gadgets, and synchronize information to the cloud for information offering to medicinal services suppliers and health care coverage organizations. To save the coordinate of wellbeing information, inside each record, a proof of honesty and approval is forever retrievable from cloud database and is secured to the blockchain arrange. In addition, for versatile and execution contemplations, we receive a tree-based information preparing and clumping strategy to deal with expansive informational indexes of individual wellbeing information gathered and transferred by the portable stage.

Keywords: Blockchain Network, Integrate, Utilizing.

I. INTRODUCTION

It is an extremely energizing time for medicinal services and data innovation (IT). Because of upgrades in hereditary research and the progression of accuracy prescription, human services is seeing an imaginative way to deal with malady avoidance and treatment that consolidates an individual patient's hereditary cosmetics, way of life and condition. All the while, IT progression has created extensive databases of wellbeing data, gave instruments to follow wellbeing information and drew in people more in their very own medicinal services. Consolidating these progressions in social insurance and data innovation would encourage transformative change in the field of wellbeing IT.

As of late, the ascent of wearable innovation and the Internet-of-Things has conveyed extraordinary chances and difficulties to the human services area. Empowered by distributed computing and enormous information examination, the information gathered from individual gadgets adds to huge wellbeing information and profitable experiences can be

inferred. Emergency clinics and therapeutic foundations can utilize this information to connect with other Electronic Health Record (EHR) information, for example, clinical notes, to encourage wellbeing observing, ailment judgments and treatment. Medical coverage organizations can make. Point by point and vital approaches as per singular qualities, profiting clients to pick adaptable protection designs as indicated by their necessities. To deal with wellbeing information sharing between organizations, there is a requirement for a protected information sharing framework. Be that as it may, there are a few difficulties identified with protection, security, and interoperability. In the first place, wellbeing information are very security delicate, particularly as more information are putting away in an open cloud, raising the dangers of information presentation. Second, current frameworks utilize incorporated design, which requires unified trust.

II. METHODS AND MATERIAL

System: Input, Output, Function, Success, Failure

Input: Sensor data signal which is not regular or Change in Signal

Output: End User get informed with alert SMS and app notification of Disaster alerts and Prediction data.

Functions:

1. Access ():- In this module we are going to access the feature provided by the module which Will include Sensor data access.

2. Control ():- In this module we are controlling the Alert System by using System which is connected to hardware or sensor data.

3. Broadcast ():- In this module we are going to broadcast the alert popup Message by Real time SMS alert system And Android App Notification.

4. Success Conditions:

1. If such data which is received through sensors are not stable or are more than threshold it will predict that there is Disaster situation

5. Failure Conditions: Desired output is not generated due to following failures.

1. Software Failure
2. Hardware Failure
3. Network Connection Failure

HARDWARE INFORMATION:

Arduino Uno

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

Heartbeat sensor:

The heartbeat sensor is based on the principle of photo phlethysmography. It measures the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ (a vascular region). In case of applications where heart pulse rate is to be monitored, the timing of the pulses is more important. The flow of blood volume is decided by the rate of heart pulses and since light is absorbed by blood, the signal pulses are equivalent to the heart beat pulses.

Bluetooth Module:

It is used for many applications like wireless headset, game controllers, wireless mouse, wireless keyboard and many more consumer applications.It has range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions. It is IEEE 802.15.1 standardized protocol, through which one can build wireless Personal Area Network (PAN). It uses frequency-hopping spread spectrum (FHSS) radio technology to send data over air. It uses serial communication to communicate with devices. It communicates with microcontroller using serial port (USART).

III. LITERATURE REVIEWS

Adiseshu Hari, Manoj Jaitly, Yuh-Jye Chang, Andrea Francini [1] A smartphone can be configured to look like any Universal Serial Bus (USB) peripheral and can be managed remotely through its wireless data connection. By virtue of these features, smartphones are ideal vehicles for the delivery of a variety of brand-new, USB-powered services that support the management and troubleshooting of mobile laptops. We provide examples of such USB services and describe a general architecture for their implementation. The services are easy to deploy, because they can be extended to remote laptops without prior installation of new software, and wellsuited for delivery through virtualization in a cloud infrastructure. While our examples target mostly the enterprise, USB services, especially virtualized ones, can easily be tailored to suit a broad set of consumer applications.

Aram V. Chobanian, MD George L. Bakris, MD Henry R. Black, MD William C. Cushman, MD Lee A. Green, MD, MPH Joseph L. Izzo, Jr, MD Daniel W. Jones, MD Barry J. Materson, MD, MBA Suzanne Oparil, MD Jackson T. Wright, Jr, MD, PhD Edward J. Roccella, PhD, [2] MPHF or more than 3 decades, the National Heart, Lung, and Blood Institute (NHLBI) has administered the National High Blood Pressure Education Program (NHBPEP) Coordinating Committee, a coalition of 39 major professional, public, and voluntary organizations and 7 federal agencies. One important function is to issue guidelines and advisories designed to increase awareness, prevention, treatment, and control of hypertension (high blood pressure [BP]). Since the publication of "The Sixth Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure"

Chang Liua, Qing Zhua, Kenneth A. Holroydb, Elizabeth K. Seng b [3] Modern smart mobile devices offer media-rich and context-aware features that are highly useful for electronic-health (e-health) applications. It is therefore not surprising that these devices have gained acceptance as target devices for e-health applications, turning them into m-health (mobile-health) apps. In particular, many e-health application developers have chosen Apple's iOS mobile devices such as iPad, iPhone, or iPod Touch as the target device to provide more convenient and richer user experience, as evidenced by the rapidly increasing number of m-health apps in Apple's App Store. In this paper, the top two hundred of such apps from the App Store were examined from a developer's perspective to provide a focused overview of the status and trends of iOS m-health apps and an analysis of related technology, architecture, and user interface design issues. The top 200 apps were classified into different groups according to their purposes, functions, and user satisfaction. It was shown that although the biggest group of apps was medical information reference apps that were delivered from or related to medical articles, websites, or journals, mobile users disproportionally favoured tracking tools. It was clear that m-health apps still

had plenty of room to grow to take full advantage of unique mobile platform features and truly fulfil their potential. In particular, introduction of two- or three-dimensional visualization and context-awareness could further enhance m-health app's usability and utility. This paper aims to serve as a reference point and guide for developers and practitioners interested in using iOS as a platform for m-health applications, particular from the technical point of view.

Ali Kemal Yetisen,, a J. L. Martinez-Hurtado, a Fernando da Cruz Vasconcellos, a M. C. Emre Simsekler,b Muhammad Safwan Akrama and Christopher R. Lowea [4] The rapidly expanding number of mobile medical applications have the potential to transform the patient–healthcare provider relationship by improving the turnaround time and reducing costs. In September 2013, the U.S. Food and Drug Administration (FDA) issued guidance to regulate these applications and protect consumers by minimising the risks associated with their unintended use. This guidance distinguishes between the subset of mobile medical apps which may be subject to regulation and those that are not. The marketing claims of the application determine the intent. Areas of concern include compliance with regular updates of the operating systems and of the mobile medical apps themselves. In this article, we explain the essence of this FDA guidance by providing examples and evaluating the impact on academia, industry and other key stakeholders, such as patients and clinicians. Our assessment indicates that awareness and incorporation of the guidelines into product development can hasten the commercialization and market entry process. Furthermore, potential obstacles have been discussed and directions for future development suggested.

IV. PROPOSED SYSTEM

We propose a mobile user controlled blockchain-based system for personal health data sharing and collaboration. In the implementation, we build the system that data compere with dataset sample. System generate user pattern according user behaviour, which is a permissioned blockchain requiring the network nodes to validate, and realizes a privacy preserving personal healthcare system with a broader coverage of the healthcare ecosystem from the end device to the cloud, as well as the emphasis of the user ownership for health data. A mobile application is deployed to collect health data from personal wearable devices, manual input, and medical devices, and synchronize data to the cloud for data sharing with healthcare providers and health insurance companies. To preserve the integrate of health data, within each record, a proof of integrity and validation is permanently retrievable from cloud database and is anchored to the blockchain network.

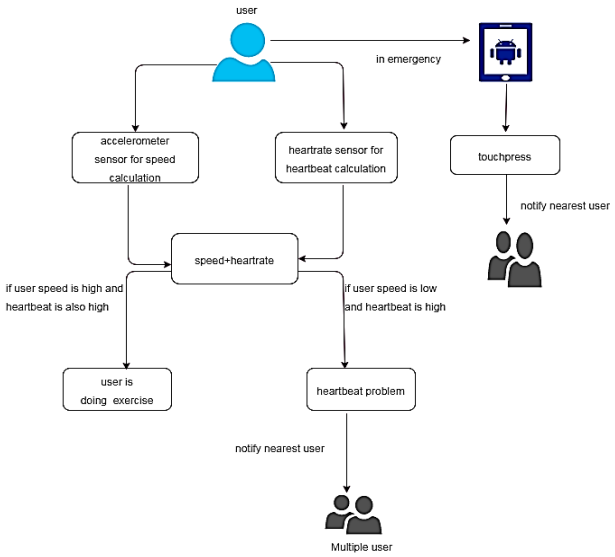

Fig 1 : System Architecture

V. RESULT AND DISSECTION

An innovative user-centric health data sharing solution by utilizing a decentralized and

permissioned block chain to protect privacy using channel formation scheme and enhance the identity management using the membership service supported by the blockchain. A mobile application is deployed to collect health data from personal wearable devices, manual input, and medical devices, and synchronize data for data sharing with healthcare providers and health insurance companies.

To preserve the integrate of health data, within each record, a proof of integrity and validation is permanently retrievable from cloud database and is anchored to the blockchain network. Moreover, for scalable and performance considerations, we adopt a tree-based data processing and batching method to handle large data sets of personal health data collected and uploaded by the mobile platform.

VI. Circuit Diagram

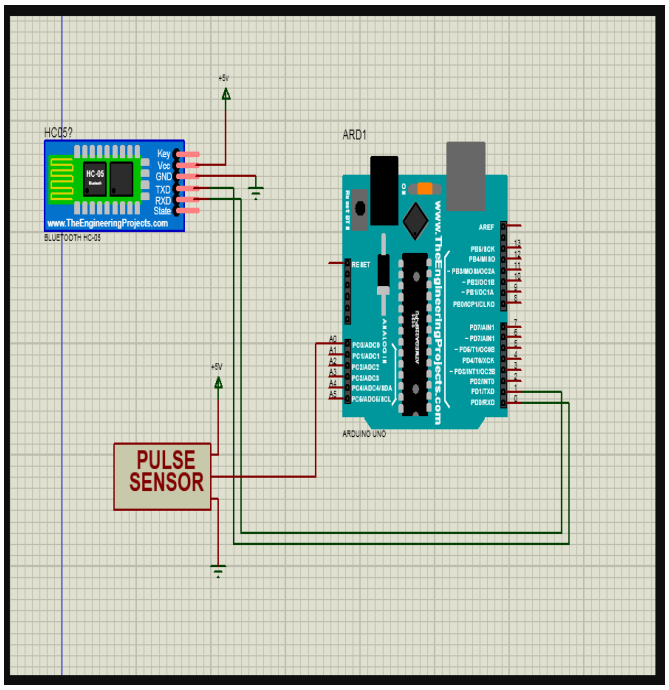

Fig 2. Circuit Diagram

VII. CONCLUSION

Blockchain technology addresses interoperability challenges, is based on open standards, provides a shared distributed view of health data and will achieve widespread acceptance and deployment throughout all industries. In this paper, we design and implement a mobile healthcare system for personal health data collection, sharing and collaboration between individuals and healthcare providers, as well as insurance companies. The system can also be extended to accommodate the usage of health data for research purposes. By adopting blockchain technology, the system is implemented in a distributed and thrustless way. The algorithm to handle data records can preserve both integrity and privacy at the same time.

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