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IOT Based Calorie Calculator For Healthcare System

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Abstract: The Internet of Things (IoT) makes brilliant items a definitive building hinders in the improvement of digital physical savvy inescapable systems. The IoT has an assortment of utilization areas, including human services. In the existing system there is no system for analyze step count and medical fitness analysis together. The proposed system is trying to calculate the temperature, blood pressure and heartbeat measurement. In modification part, we include touch sensor based Hardware for measuring step count and calorie burnt in the human body and further blood pressure is measured and updated status to be stored in cloud server. Reminder notification is also included to alert on the phone through messages by using GSM. The system can be used in any big pharma or medical organisation where a large number of patients come, the details of every patient is updated on the web server and the pharma doctor can access the details from anywhere and give the prescription accordingly. The patient also get notification on their mobiles.

KEYWORDS: Internet of Things, Global System for Mobile Communication, Step count, Reminder Notification, Calorie Burnt, Blood Pressure, Web Server

1.Introduction

The Internet of things (IoT) is the inter-networking of physical gadgets, vehicles (likewise alluded to as "associated gadgets" and "brilliant gadgets"), structures, and different things—implanted with hardware, programming, sensors, actuators, and system network that empower these articles to gather and trade information. The IoT will make an enormous system of billions or trillions of "Things" imparting each other. The IoT is not subversive unrest over the current advances, it is extensive usages of existing advances, and it is the production of the new correspondence modes. The IoT mixes the virtual world and the physical world by bringing distinctive ideas and specialized parts together: unavoidable systems, scaling down of gadgets, portable correspondence, and new environment. In IoT, applications, administrations, middleware segments, systems, and end hubs will be fundamentally sorted out and utilized as a part of whole new ways.
IoT offers a way to investigate complex procedures and connections. The IoT suggests a cooperative connection between the genuine/physical and the advanced/virtual universes: physical substances have computerized partners and virtual portrayal; things get to be setting mindful and they can detect, convey, associate, and trade information, data, and learning. New open doors will meet business prerequisites, and new administrations will be made in view of continuous physical world information.
Everything from the physical or virtual world will potentially be associated by the IoT. Network between the things should be accessible to all with minimal effort and may not be possessed by private elements. For IoT, insightful adapting, quick sending, best data comprehension and deciphering, against extortion and vindictive assault, and security insurance are basic necessities.

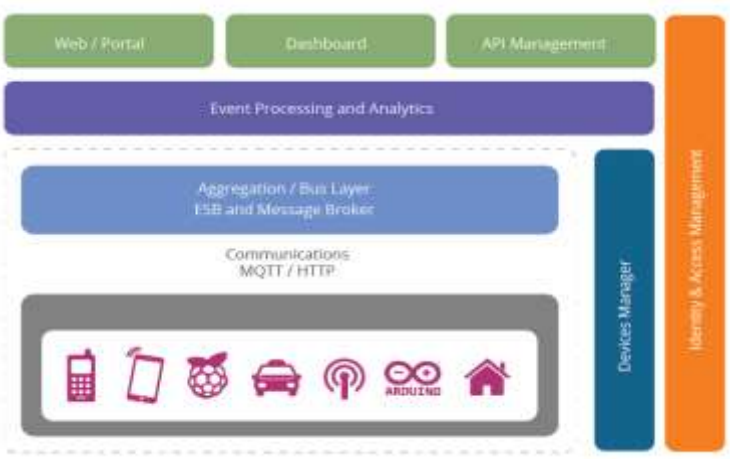

Figure 1. Architectural Diagram for IOT

The base layer of the design (which shown in figure 1), is the gadget layer. Gadgets can be of different sorts, however so as to be considered as IoT gadgets, they should have a few interchanges that either in a roundabout way or straightforwardly connects to the Internet.
The communication layer supports the connectivity of the devices. There are multiple potential protocols for communication between the devices and the cloud. The most well-known three potential protocols are:-HTTP/HTTPS, MQTT 3.1/3.1.1,Constrained application protocol.
The bus layer provides ability to support an HTTP server to talk to devices and it also aggregates and combines communications from different devices and to route communications to a specific device and it also facilitates the ability to bridge and transform different protocols.
The event processing and analytics layer takes the events from the bus and provides the ability to process and act upon these events. A core capability here is the requirement to store the data into a database. This may happen in three forms.
Client/External communications layer, in which, the reference architecture needs to provide a way for these devices to communicate outside of the device-oriented system. This includes three main approaches. Firstly, we need the ability to create web-based front-ends and portals that interact with devices and with the event-processing layer. Secondly, we need the ability to create dashboards that offer views into analytics and event processing. Finally, we need to be able to interact with systems outside this network using machine-to-machine communications (APIs).
Device management (DM) is taken care of by two segments. A server-side framework (the gadget director) speaks with gadgets by means of different conventions and gives both individual and mass control of gadgets. It additionally remotely oversees programming and applications conveyed on the gadget. It can bolt and additionally wipe the gadget if fundamental. The gadget supervisor works in conjunction with the gadget administration operators. There are various distinctive operators for various stages and gadget types. The device administrator additionally needs to keep up the rundown of gadget characters and guide these into proprietors. It should likewise work with the character and get to administration layer to oversee get to controls over gadgets.
Identity and Access Management, the final layer provides various services, such as OAuth2 token issuing and validation other identity services including SAML2 SSO and Open Id. It connects support for recognizing requests from web server and it also provides directory of users.

1. Existing Healthcare System

We have only particular system to examine various factors separately like there is separate system for blood pressure, for examining body temperature, for counting calorie burnt, for measuring heart beat and also we can't obtain these data on a web portal so that we can monitor the healthcare system of a person. We have to also spend our man power to control system. Also there is no system to monitor environmental conditions. Nowadays there is no connectivity of health care solutions through cloud computing or other gives caregivers through which we can access real time information that enables them to make informed decisions as well as offer treatment that is evidence based. This ensures health care provision is timely and treatment outcomes are improved. So these features must be taken care in the future health care system.
Zankhana et al (2016) proposed fathoming medical problems using IoT which exhibits the compositional survey of savvy human services framework. The fathoming medical problems were expected to give Quality Health Care. Utilizing this framework engineering, patients' body parameters can be measure continuously. This information which is recorded with the assistance of sensors is put away into My Sql database server which oversees information and gives availability. With the assistance of various basic leadership calculations choices can be made and as indicated by it individuals have entry to database. Patient can check their restorative record Hence this framework gives Quality Health Care to everybody and mistake free and smooth correspondence to patients.

Rakesh gaur et al (2016) purposed a design system to depict the whole checking life cycle and highlights fundamental administration segments. It fills in as a major reason for accomplishing powerful, productive, and secure wellbeing observing. The principle essential points are to plan an IOT based design for wellbeing related issues, for example, Diabetics, Heart Monitoring framework, Pulse rate estimation, Daily Activity, kidney working. The Data acquired through sensors are transferred to the cloud and imparted to others. Information got through sensors are handled and gotten to through a PDA.

S.M riazul islam, Daehan Kwak and Mahmud Hossain et al (2015) mainly brief about the progresses in IoT-based social insurance advances and surveys the best in class arrange structures/stages, applications, and modern patterns in IoT-based medicinal services arrangements. Furthermore, they also show their concern towards IoT security and protection highlights, including security prerequisites, risk models, and assault scientific classifications from the human services point of view. Assist, this paper proposes a canny community oriented security model to limit security chance; examines how distinctive advancements, for example, enormous information, surrounding insight, and wearables can be utilized in a medicinal services setting; addresses different IoT and e-Health arrangements and directions over the world to decide how they can encourage economies and social orders as far as manageable improvement; and gives a few roads to future research on IoT-construct human services based with respect to an arrangement of open issues and difficulties.
Moeen, Alex page and Gonzalo Mateos et al(2015) focused especially on the clinical field and analyze the open doors managed by accessible and up and coming advancements and the difficulties that must be tended to with a specific end goal to permit reconciliation of these into the act of pharmaceutical.

B. Sobhan Babu , K Srikanth and T. Ramanjaneyulu et al (2013) purposed that IoT turns into an utility with expanded refinement in detecting, incitation, interchanges, control, and in making learning from endless measures of information. This will bring about subjectively extraordinary ways of life from today. So medical issues are effectively anticipated toward the starting stage in view of IoT medicinal services framework.

2. PROPOSED SYSTEM

This paper proposes the IOT Platform for human services as a suitable self- management model for perpetual sickness, for example, hypertension, heftiness, diabetes. The proposed stage is involved five segments. The main component is a medical sensor device to quantify and send the therapeutic information, and the second component is a virtual medical sensor which is a software sensor having a wise conclusion calculation and mashup information from different physical medical sensors and server. Furthermore, the following segment is a portable application that is searching medical information about patient or client from medical IOT gadget and additionally utilizing for self-administration. The last part is a stage and its director that empowers all segments to speak with one another by utilizing brought together API.

3.1 SYSTEM DESIGN

The system composed of four parts, the sensors collect the various information from the human body ,the controller part process the data and stores in memory, the GSM part send the notification to user and finally the last one IOT part which update the various parameters on the web server.

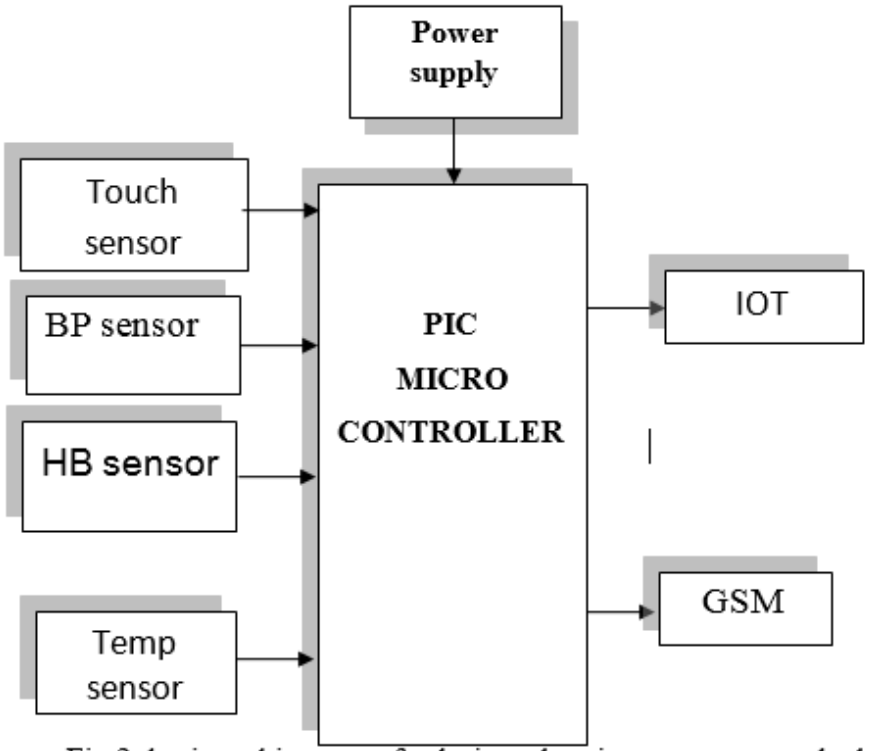

Fig.2: basic architecture of calorie and various parameter calculator

- Temperature sensor - The temperature sensor that is shown in fig2 is used to measure the temperature of the body. In the temperature functional module we developed, we use the LM34 series of temperature sensors. The LM34 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Fahrenheit temperature.
- Heart beat sensor - The pulse sensor depends on the rule of photograph phlethysmography. It quantifies the adjustment in volume of blood through any organ of the body which causes an adjustment in the light power through that organ (a vascular locale). In the event of uses where heart beat rate is to be observed, the planning of the beats is more imperative. The stream of blood volume is chosen by the rate of heart heartbeats and since light is consumed by blood, the flag heartbeats are proportionate to the heart beats.
- Blood pressure sensor - The Blood Pressure Sensor is a non-intrusive sensor intended to gauge human pulse. It gauges systolic, diastolic and mean blood vessel weight using the oscillometric system. Beat rate is likewise revealed.
- Touch sensor - A touch sensor is a kind of switch that lone must be touched by a question work. It is utilized as a part of numerous lights and divider switches that have a metal outside and in addition on open work stations. A touchscreen incorporates a variety of touch switches on a show. A touch switch is the most straightforward sort of material sensor.

Working Principle:

In the proposed framework PIC is the essential controller which is driven by 5V DC supply. In customary strategy the gadgets are costly and don't interface with a client portable and information representation. Henceforth we proposed a combination of sensors and IoT. The TOUCH sensor, BP sensor, HEART BEAT sensor and TEMP sensor are interfaced with miniaturized scale controller. In this proposed framework the patient body condition is observed by the sensors. Temperature sensor is utilized to detect temperature and heart beat sensor is to screen the patient pulse. At that point the BP sensor is utilized to detect the beat rate and touch sensor sense the patients stride and how much calories he spent and the detected information are sends to the small scale controller. The present status is upgraded in IOT. On the off chance that any irregularities found in these detected information the data is send to the individual overseer of that patient through GSM.

FUTURE ENHANCEMENT:

A potential future avenue would be to investigate the commuting patterns of individuals and how they affect their mood in the working environment. It would also be interesting to discover which features predict (or possibly correlate with) which mood and provide personalized feedback based on them. For example, if features from accelerometer are selected for happiness, whilst also utilizing some high level activity recognition output, we can infer whether specific activities or the lack of activities result in a specific mental state. The applicability of the introduced mood prediction framework in different work environments, using either smartphones or wearable devices (or both), and the relations between different moods are further interesting research questions.

3. Conclusion

Specialists over the world have begun to investigate different mechanical answers for upgrade medicinal services arrangement in a way that supplements existing administrations by activating the capability of the IoT. This paper reviews assorted parts of IoT-based human services advancements and presents different medicinal services organize designs and stages that bolster access to the IoT spine and encourage restorative information transmission and gathering. Considerable R&D endeavors have been made in IoT-driven human services administrations and applications. What's more, the paper gives nitty gritty research exercises concerning how the IoT can address pediatric and elderly care, unending sickness supervision, private wellbeing, and wellness administration. For more profound experiences into industry slants and empowering advances, the paper offers a wide view on how later and progressing propels in sensors, gadgets, web applications, and different advances have spurred moderate social insurance devices and associated wellbeing administrations to boundlessly grow the capability of IoT-based human services administrations for further improvements. To better comprehend IoT social insurance security, the paper considers different security prerequisites and challenges and discloses diverse research issues here to propose a model that can relieve related security dangers. The exchange on a few vital issues, for example, institutionalization, organize sort, plans of action, the nature of administration, and wellbeing information security is relied upon to encourage the give a premise to further research on IoT-based social insurance administrations. This paper presents eHealth and IoT approaches and controls for the advantage of different partners keen on evaluating IoT-based medicinal services innovations. In entirety, the aftereffects of this study are relied upon to be helpful for scientists, engineers, wellbeing experts, and policymakers working in the region of the IoT and social insurance advancements.

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