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APP BASED INSTANT -BED AND BLOOD BOOKING FOR HOSPITALS WITH
SYSTEMATIC FACILITY MANAGEMENT SYSTEM USING RASPBERRY PIGeetha shree M.S, UG Scholar^{*1}, Ambika L G, Assistant professor² & Arpithareddy A P, UG Scholar³^{*1,2&3}Dept. of Computer Science and Engineering Rajarajeswari College of Engineering Bangalore, india

ABSTRACT

As we know that the population of the country is growing rapidly daily, the number of people with various diseases are also increasing rapidly. the paper mainly focuses on health of elderly people. Even though many health care professionals come into contact with older people, sometimes during emergency their arrival may run out of time or if the office service time are not available. and there are many cases wherein blood and beds will not be available in hospitals during emergency. In such cases their treatment is very challenging. So we have come up with an idea to pre-book the required bed by using an iot based concept to help the patient prior to reach the hospitals via ambulance and also to book the blood with a single click using a web app which can efficiently accomplish those requirement. Here the health status of the patient can be easily tracked by using tiny wireless powered and lightweight sensors using body sensor network (BSN) technology which will report to the ambulance people if there is an emergency, by using GPS location of patient the ambulance people can reach the patient and if there is a requirement of blood, it can be booked with a single click.

Keywords: raspberry pi, IR sensors, motion detection sensors, relay, alarm, internet of things (IoT), health care applications.

I. INTRODUCTION

The latest couple of decades have seen a reliable addition in future in different parts of the world inciting a sharp rising in the amount of elderly people. The current report taken from the United Nations [1] anticipated that there would be 2 billion (22% of the total populace) more established individuals by 2050. Also, investigate demonstrates that around 89% of the developed people are presumably going to live self-sufficiently. Nonetheless, restorative research reviews found that around 80% of the matured individuals more seasoned than 65 experiences no less than one endless illness making numerous matured individuals have difficulty in dealing with themselves. In like manner, giving a respectable individual fulfillment for developed people has transformed into a certifiable social test without a moment's pause. Fast expansion of data and correspondence advances is empowering imaginative medicinal services arrangements and devices that show guarantee in tending to the previously mentioned challenges. Presently, Internet of Things (IoT) has turned out to be a standout amongst the most capable correspondence standards in this 21st century. Amongst the IoT condition, all items in our day to day life turn out to be a piece of the web because of their correspondence and figuring capacities (counting miniaturized scale controllers, handsets for computerized correspondence). IoT expands the idea of the Internet and makes it more inescapable.

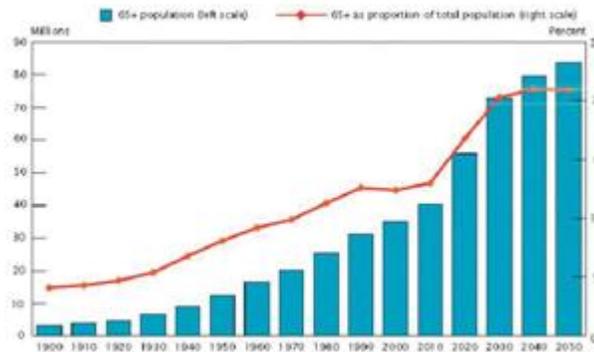


Fig:1.graph of increase in people population

iot grants steady associations among different sorts of contraptions, for instance, helpful sensor, checking cameras, home mechanical assemblies so on. [3], [4]. by virtue of that reason iot has ended up being more beneficial in a couple of domains, for instance, social protection system. in restorative administrations structure, iot incorporates various sorts of poor sensors (wearable, inserted, and condition) that enable developed people to acknowledge exhibit day remedial human administrations benefits wherever, at whatever point. additionally, it in like manner altogether upgrades developed social orders individual fulfillment. Few disadvantages regarding govt. hospitals are: non availability of rare blood groups, on availability of hygienic bed during emergencies, lack of facilities with respect to ambulance. The body sensors organize (BSN) innovation [5] is a standout amongst the most basic advancements utilized as a part of IoT-based present day medicinal services framework. It is very essential that a gathering of low-power and lightweight remote sensor hubs that they are utilized to screen the human body works and encompassing condition. In case the patient fell down then The Motion detection sensor will sense the information and intimates the status to Ambulance with GPS location of patient. The Ambulance driver using his App reaches the patient using the maps. Before the driver takes the patient to any hospital checks for the availability of beds or wards using the smart web App. If there is availability then he can book the bed instantly and can reach the destination easily. If not he can take the patient to another hospital. After reaching the hospital if patient needs blood immediately the using web app one can book the blood easily.

The operation of different components are given below:

A.RASPBERRY PI

The Raspberry Pi is a less cost, single-board PCs made in the UK by the Raspberry Pi Foundation to impel the preparation of chief programming outlining in schools and in making nations. The essential model damage up in a general sense more prominent than foreseen, offering outside its objective promote for utilizes, for example, mechanical self-administration. It prohibits secondary, (for example, consoles, mice and cases). By the by, two or three trimming have been intertwined into two or three official and easygoing social events.

As appeared from the Raspberry Pi Foundation, more than 5 million Raspberry Pi had been sold on February 2015, making it the excellent achievement British PC. By November 2016 11 million units were sold, and 12.5m by March 2017, by making it the third biggest achievement "widely supportive PC". In July 2017, deals came to pretty much 15 million. In March 2018, deals achieved 19 million.

Specific secondary devices like mouse, console, Wi-Fi connector shall be connected utilizing four of its USB2.0 ports in order to make use as the full size PC. In like way the board incorporates an Ethernet port to associate with deal with, GPIO pins to communicate and to control switches, sensors, LEDs and particular contraptions.



Fig 1.2: raspberry pi

A broad assortment of screens like projectors, LCD screens, TVs shall be connected using HDMI port. Some extra highlights combine the sound jack and the camera connector to interface camera. These diverse highlights empower the clients to utilize Raspberry pi in expansive grouping of livelihoods

B. IR SENSOR

An infrared sensor is an electronic instrument and it can be utilized to detect certain qualities of its surroundings by discharging and identifying infrared radiations. This sensor is additionally equipped for estimating heat which is produced by a protest and distinguishing its movement. Sources that produce IR-radiation incorporate blackbody radiators, silicon carbide and so forth...

IR sensors ordinarily utilize infrared lasers and LEDs with particular infrared sources. Transmission medium for IR radiations is contained vacuum, air or an optical fiber. Optical focal points produced using quartz, CaF₂, Si, Ge, polyethylene Fresnel focal points and Au or Al mirrors, are utilized to center IR radiations.

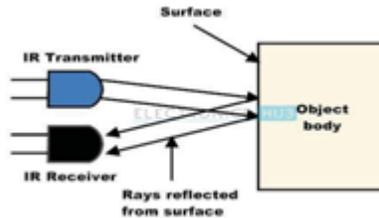


Fig1.3: working of IR sensor

C. MOTION DETECTION SENSOR

A motion detection sensor uses one or multiple technology in order to detect movement in an area After recognizing movement, they produce electrical flag in view of which a few moves are made. Motion detectors are classified as active detectors, passive detectors, hybrid sensors, passive infrared detectors (PIR) active IR sensors, ultrasonic detectors etc. Falls of elderly reliably purposes authentic restorative issues as decline of their physical wellbeing. break is the most widely recognized damage which may prompt trance like state, loss of motion and cerebrum injury. A wearable device is placed on human waist. by acceleration analysis it is possible to detect elderly falling, followed by obtaining geographic position to minimize negative influence.

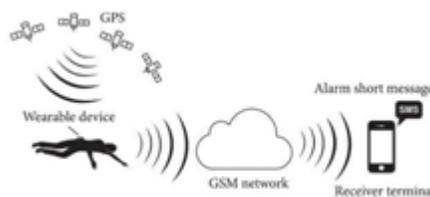


Fig 1.4: system architecture of motion detection sensor

D. RELAY AND ALARM

A relay is a switch which is worked electrically. Transfers utilize electromagnet to work switch mechanically. A transfers Output Circuit is the segment of the hand-off that switches on the heap and plays out an indistinguishable capacity from the mechanical contacts of electromechanical transfers.. Alarm can be used to alert a person or group of people at specified time.

II. RELATED WORKS

Focused on watching body temperature and pulse rate of a man using a raspberry pi. The essential idea of the paper relies upon the joining of remote prosperity sensor framework and disseminated figuring. Amazon EC2 cloud advantage gave by Amazon Web Service is used for securing the information

Executed a remote patient telemonitoring structure using android advancement. LM35 and ppm sensors are interfaced with PIC16F887A microcontroller and data is sent to an android based convenient application by methods for Bluetooth and GSM module [12].

Health checking frameworks that can transmit the fundamental indications of a patient through a specially appointed remote sensor organize for a mass causality crisis application. The wellbeing observing gadget is to be set on a harmed casualty amid a crisis and go about as a sensor hub to associate with a remote impromptu system to transmit the patient's essential sign information. The objective market for this framework is crisis reaction foundations, for example, civil crisis administrations, city and state EMS and government crisis administrations. Most Wireless wellbeing observing frameworks focused on home clients and we have not discovered an excessive number of frameworks intended for crisis reactions. In this manner, we anticipate the framework to experience just a little measure of rivalries. The framework is to be utilized as a feature of the primary reaction to a mass causality occurrence that may overpower the limit of the first responders [6].

The WSN is utilized for broad information transmission remove. The RG is in charge to gather patient's physiological data. Also, the mind server is furnished with a database administration framework. The framework is fit for performing long haul checking of patients' conditions, and is given cautioning salvage component. The usage results can additionally approve the attainability of the proposed home portable care framework [7].

In this undertaking they have likely made a wellbeing checking framework that can transmit the crucial indications of a patient through an impromptu remote sensor organize for a mass causality crisis application. The wellbeing checking gadget is to be put on a harmed casualty amid a crisis and go about as a sensor hub to interface with a remote specially appointed system to transmit the patient's crucial sign information. The objective market for this framework is crisis reaction organizations, for example, metropolitan crisis administrations, city and state EMS and government crisis administrations (e.g., FEMA or the National Guard). Most Wireless wellbeing observing frameworks focused on home clients and we have not discovered an excessive number of frameworks intended for crisis reactions. Along these lines, we anticipate our framework to experience just a little measure of rivalries [4].

III. IMPLEMENTATION

System design:

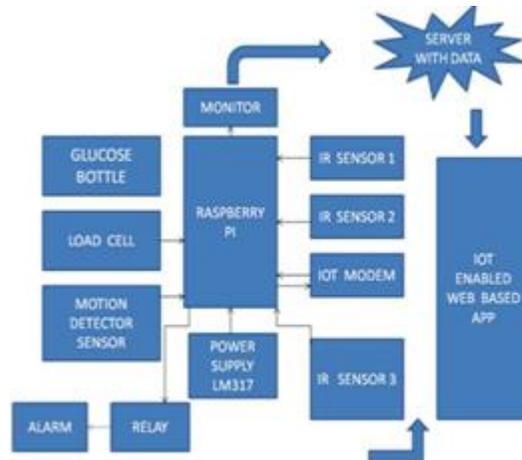


Fig 1.5: Proposed Systematic facility management system using Raspberry Pi

Working principle:

Basically project consists of three important parts in it. The first one is a Hardware part where raspberry Pi is interfaced with motion detection sensor to identify person is fine or fainted and fell down. The IR sensors to monitor the Patient beds weather they are filled or empty. The Alarm is to notify the surrounding people regarding the status. IOT modem is to link Raspberry Pi with Server. The second part of the project is the server with data base to store the data and to link Hardware with Web App. The third part of the project is web app provided for Ambulance driver or common people so as to pre book the patient bed and blood if it's needed before reaching any hospital.

In case the patient fell down then The Motion detection sensor will sense the information and intimates the status to Ambulance with GPS location of patient. The Ambulance driver using his App reaches the patient using the maps. Before the driver takes the patient to any hospital checks for the availability of beds or wards using the smart web App. If there is availability then he can book the bed instantly and can reach the destination easily. If not he can take the patient to another hospital. After reaching the hospital

if patient needs blood immediatly the using web app one can book the blood easily. Using load cell glucose level of glucose bottles can be easily measured and if the level goes low the alarm will turn on giving and indication to replace the glucose bottle injected to patient so as to avoid reverse flow of blood.

App design:

Process of bed booking using app:

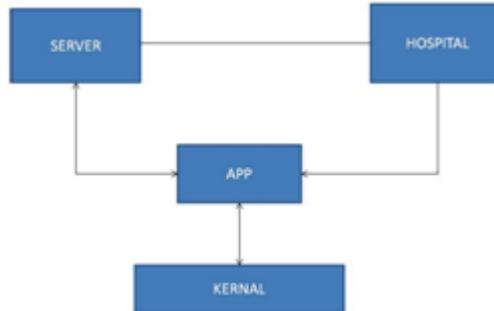


Fig 1.6: Flow diagram of bed booking using app

Kernel is the OS inside smart phone. There is an end-to-end connection between the app and the sever to constantly send & retrieve details. This app is designed wherein the server checks for the availability of beds in the hospital and also provides information about the various costs for beds in different hospitals nearby and the hospital will inform patient/individual about the availability of beds through app. In this way a patient can easily books beds during emergency.

App design:

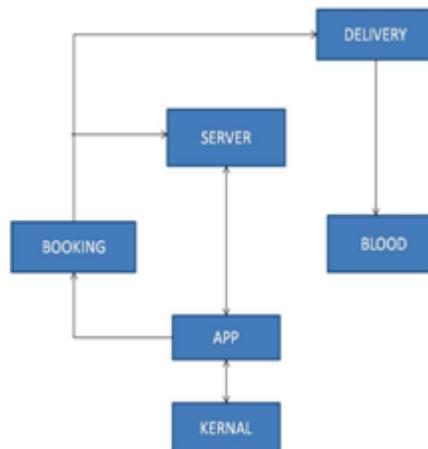


Fig 1.7: Flow diagram of blood booking using app .

Process of blood booking using app:

Smart phones has kernel as OS inside. As we know that an end-to-end connection between app and the server helps to send information to server consequently fetch information from the server. An individual/patient can book the blood using app. Here the app includes different blood groups and facilitates for delivery of the same. Server checks for the availability of blood and informs patient about it through app. If the blood is available, booking information will be sent to the one who delivers blood and blood is delivered to that individual/patient.

IV. CONCLUSION

One can pre-book the hospital bed for patient before reaching the hospital using web app. One can easily check of availability of blood in blood banks and book for the needed group instantly. And can also be used to deliver the

blood to patient. Glucose bottle level can be easily monitored to avoid blood reverse flow. In this way a good and healthier link can be established between Hospitals and patients. It can be used for wireless health monitoring for aged people.

V. FUTURE ENHANCEMENTS

The concept can be used in agriculture with different sensors to monitor the health of crops. The concept can be used to deliver the essential type of blood required immediately through an app. The concept can be used in industries to maintain the healthy condition of machineries. The concept can be used in Making of smart cities. The concept can be used in CET counseling for seat booking. The concept can be implemented in rural areas through offline

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