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RFID Based Health Care Dosage Monitoring System

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ABSTRACT- In superior nations, the number of Aged recipients who take drug treatments every day has been increasing due to the ageing of the population. to attend to senior residents who can't be able to attend to themselves, designed a perception drug case, which contains exceptional cases full of exclusive drugs. on this design, with the help of IR sensor the message may be introduced to the caretaker about the dosing circumstance of the affected person via GSM. The Proposed iMec (intelligent remedy case) server assisted their caretakers in dose tracking.if you want to lessen many risks of irrelevant medicine (e.g.overdose). The iMec estimates the dosing timing and triggers the alarm to intimate the affected person, and then the specific rack containing medication opens after the alarm sound. This enabled the patient to get the drugs on time with out overdose and also care taker will obtain a message whether the recipient ate up remedy or not. when the recipient takes the medicinal drug, the sensors will sense the existing situation of the recipient and if iMec finds any abnormality, without delay it will intimate to the caretaker in the shape of message through Grammarly Greenport generated on three of 25 GSM.for that reason, the IR sensor experience the presence of medicines in the medicine case and GSM modem ship a message to caretaker. This avoids the overdose and accidents that prompted due to overdose. additionally presenting RFID (Radio Frequency identity) and Webcam for detecting the expiry of drugs with the aid of setting in the medication cases and provides interactive video to growth the charge of accuracy respectively.

Index Terms— GSM, iMec, IR sensor, RFID, Webcam.

I. INTRODUCTION

The sensor is using to detect the living condition of the recipient and sends the information to the care taker trough GSM. [1]

The proposed intelligent medicine case (iMec) and its system is for monitoring and recognizing the living state of a recipient by using sensors which are embedded in the living environment. It also recognizes how medicines are taken from its storage space by using are embedded in the medicine case. These dosing histories are accumulated in a database server.

Therefore, caretakers check the dosing condition and remind the recipient to take medicine. [3] The implemented medicine case for the correct dosing was based on PIC microcontroller. It depends on analog to digital converter that it converts the analog to digital which is used to show the timings and number of medicines in the LCD. The IR sensor detects when the patient takes the medicine then it sends the message to the caretaker through GSM. [1]

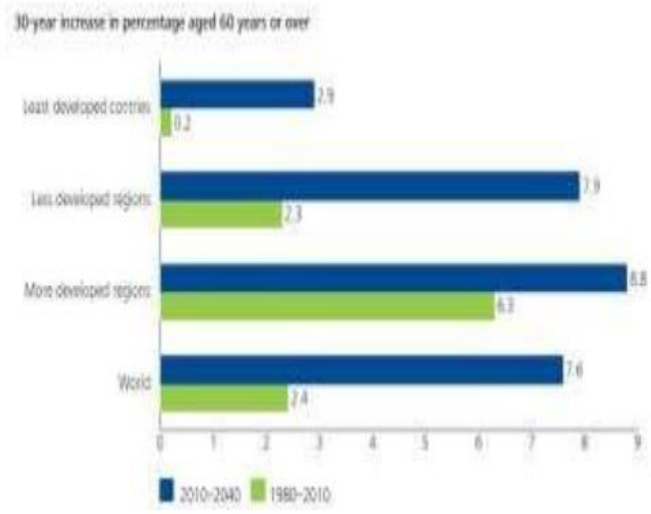

Fig 1: Global Health Care Drivers- Population Aging.

In the proposed iMec system, it warns the recipient in the case of forgetting the dose and it could confirms the dosing timing to consume the particular. However, conventional systems cannot recognize that a recipient is in some living state related to dosing timing. But it cannot warn or give the information to the caretaker about the misplace of the medicines or expiry of the particular medicine.

RFID can be used to improve emergency communication systems for future disaster situations. RFID has strong application potential with medical device companies. The RFID system includes the hardware main components like (tags, readers and antennas) and the software systems.RFID

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systemn be passive or active, depending on powering techniques. Webcam is to broadcast video on the web. It is a small camera that either attaches to a user's monitor or sit on a desk. [9]

II. LITERATURE SURVEY

In recent years, several tending organizations have started Victimization wireless Senor Networks to remotely monitor Patient health. several tending organizations and insurance companies have conjointly started victimization the electronic medical record (EMR) system by that the medical records area unit maintained Associate in Nursing exceedingly in a very} centralized information within the variety of an electronic record and therefore the records area unit keep within the cloud. [15]The users, WHO once being sick wont to rely solely on the doctor and his treatment, currently need to actively influence and take control over their health and therefore the healing method.

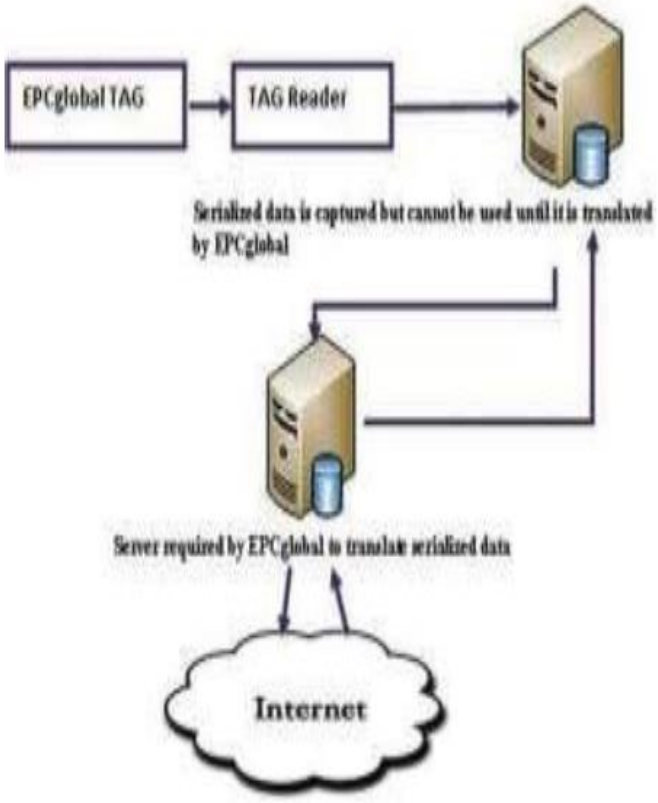

Fig2: RFID System.

The Web, with the various services it provides and novel mobile technologies, represents an acceptable and reliable communication and collaboration channel. [6] Primary health care demands of users within the context of (their) health area unit to urge the maximum amount information mutually will from completely different aspects a couple of specific disease; to require additional active role in activity the sickness to use the applications and electronic services with that one will simplify the method of , healing, etc. These e-services in collaboration with health care establishments, their services and information systems, combined with active role of all participants of health care system, area unit outlined as e-health, which may be a part of the world strategy of Health. [8]

Fig 3: Standard Dosing Observance System.

The System uses 3 completely different sensors that area unit Temperature, Heartbeat and Saline level. this method will be used just for admitted patient not for moving patient. At present this method will be useful to doctor to diagnose the patient through net. within the context of worldwide e-health activities, many alternative applications and services have been developed that serve users in up their health or getting the data they have. The services will be roughly divided into 3 teams that change 1) exploit information, 2) social inclusion and networking, and 3) information and automation of various user eventualities with health care establishments. even supposing net offers an excellent potential in developing 45services within the space of e-health, huge amounts of information and completely different fragmented services cause trouble for the users. they need hassle characteristic suitable and verified services from the facet of reliableness, safe use and information confidentiality. [4] as a result of fragmentation of information, users have to be compelled to utilize many completely different applications and services at a similar time, that takes longer, especially thanks to disconnection of some services, which can clearly be associated. thanks to the dimension of the Internet, users don't seem to be even attentive to the existence of some services. a possible answer for these troubles lies within the development of a bigger collaboration system that may logically connect completely different services and applications and consequently change access through one getting into purpose.[7]

A. Wireless Electronic Health Care Systems

Research advances in tending domain have facilitated the mixing of various technologies for smart,cost effective, reliable, and pervasive health observance of chronic diseases - that have affected around one billion people worldwide.[14] Current analysis efforts target developing period communication ways, mostly for Body space Networks considered to be a valuable tool in delivering BAN information to a remote server/cloud for any analysis. this might assist in reducing risks and price of remote health observance. Unlike conventional analysis in BANs wherever researchers centered on individual networks, there's a requirement to develop innovative communication ways with a spotlight on complete and good eHealth systems. This good health system should integrate the aforementioned technologies with multiple BANs, and provide rich tending services to finish users. It requires analysis on versatile topics starting from Physical and Medium Access Control (MAC) protocols to BANs existence, traffic characterization, cloud resource allocation, and cloud monitoring and maintenance.

[4]

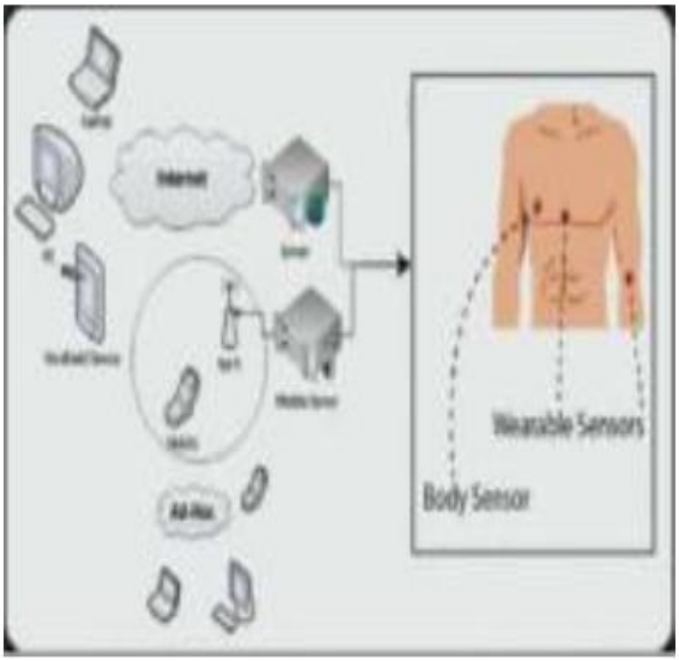

Fig. 4: Wireless Device Network

Technology should change doctors to worry for larger patient populations additional quickly and while not compromising quality of care. good dashboards, alerts, reports, automated follow-ups,asynchronous communication, and information sharing all can become a part of a doctor's "command center" that helps him or her monitor the health of thousands of patients at the same time. [5] The miniaturized sensors together with advance spontanepous network technology produce a wireless device network that unceasingly monitors the health state of patients. The advances of technology in conjunction with WSN's characteristics provide the most edges to health care. A device network that's designed to sense the health parameters of a personality's being may be a body device network(BSN).The nodes of BSNs area unit directly hooked up to anatomy and this requires utmost care. a number of the health care applications require the BSN to unceasingly operate gathering patient data for many days while not user intervention. Such applications need to watch out of the energy constraints of the device networks. [4]

Healthcare system will be characterized by presence of a large number of caretakers, like tending professionals (physicians, nurses, pharmacists, directors, etc), a large number of services (outpatient care services, rehabilitation services, etc.), and extremely specialized professionals. In order to improve the standard of treatment and guarantee additional correct diagnostics, the activities of those actors ought to be coordinated and controlled victimization economical communication techniques. [9]Even in refined tending information systems, like e-Health, specialist referral services, patient monitoring, e-prescriptions-medical records, Hospital Management data system, Telemedicine Information System, Laboratory data system, etc., the information flow still needs interaction between actors either face-to-face or via a communication system wherever users should be physically gift at either finish of the communication link to successfully establish a synchronous interaction. [5]

B. Health Care Observance

Case-Based Reasoning (CBR) may be a methodology during which knowledge comes directly from historical cases. CBR is a well established methodology for construction tending systems. one in all the engaging options of cosmic background radiation in drugs is that the ideas of diseases will be naturally drawn as cases. [7] Case will be obtained from designation a particular patient with a specific sickness. on a daily basis follow is collected and keep as cases.[13] so, the medical information system contains a made assortment of past problem solving cases keep in conjunction with their solutions. Reasoning with cases is comparable to the choice creating method of physicians. Physicians area unit snug victimization cosmic background radiation methodology in dynamically ever-changing things were much is unknown and once diagnoses don't seem to be clear. [7]

Medical Server for tending observance (MSHM) receives data from the private server, is that the backbone of the whole architecture. it's set at medical centers wherever medical services area unit provided. it's intelligent as a result of it's capable of learning patient specific thresholds and learns from previous treatment records of a patient. MSHM keeps electronic medical records (EMRs) of registered patients,

ISSN No: - 2456 – 2165

which are accessible by completely different medical workers, together with general practitioners, specialists and doctors from their offices in the hospital over the web. this state of the patient can be ascertained by the medical workers. MSHM is accountable for user authentication, accretive information from personal server, format and insert the received information into corresponding EMRs, analyze the information patterns. [2]

Mobile tending (m-health) provides the bilateral solution: the empowering of the individual observance of chronic care and therefore the effective price of health care services at all economic levels, because the proceedings of the m-health summit at the WEF confirmed.[12] M-health systems will be used for se, unnoticeable observance types; the chronic diseases monitoring is one in all them. Moreover, m-health technologies offer period observance and detection of changes in health status, support the adoption and maintenance of a healthy lifestyle, offer speedy identification of health conditions, and facilitate the implementation of interventions starting from promoting patient self-care to providing remote tending services. [11]

Hospital health care observance system is important to constantly monitor the patient's physiological parameters. For example a pregnant girl parameters like blood pressure (BP) and pulse of the lady and pulse and movements of fetal to regulate their health condition. The attached sensors on patient's body type a wireless body sensor network (WBSN) and that they area unit able to sense the guts rate, blood pressure then on. this method will sight the abnormal conditions, issue associate degree alarm to the patient and send a SMS /Email to the caretaker. [4] The patient's physiological signals are no heritable by the sensors hooked up on the patient body, and are then transmitted to the remote base-station and conjointly a PC for storing and analyzing. The system is ready to hold out a long-tem observance on patient's condition and is provided with associate degree emergency rescue mechanism victimization SMS/Email.[10]

Scientific studies during this space indicate that the utilization of telemedicine for such applications as observance of chronic care patients or permitting specialists to produce care to patients over an outsized region care have resulted in considerably improved care. for many telemedicine applications, studies have shown that there's no distinction within the ability of the provider to get clinical info, create associate degree correct diagnosis, and develop a treatment arrange that produces the same desired clinical outcomes as compared to in-person care when used fitly. [3]

III. HARDWARE NEEDS

The Hardware needs for implementing the health care supported RFID area unit a) PIC Microcontroller, b)A to D converter, c) Sensors.

A. PIC Microcontroller

PIC may be a family of Harvard design microcontrollers made by micro chip Technology derived from PIC 1650 originally developed by General Instrument's Microelectronics Division. The name PIC at the start referred to "Peripheral Interface Controller". PICs area unit popular both industrial developers and hobbyists alike as a result of their low cost, wide accessibility, massive user base, extensive collection of application notes, accessibility of low price or 4
free development tools, and serial programming (and reprogramming with flash memory) capability. The devices utilized in PIC area unit.

- PIC16F873A
- PIC16F874A
- PIC16F876A
- PIC16F877A

a). Features

- Superior reduced instruction set computer computer hardware
- All single cycle directions aside from program
- Branches that area unit two cycle
- Operational speed: DC - twenty rate clock input DC - two hundred
- Ns instruction cycle
- Up to 8K x fourteen words of Flash Program Memory .
- Up to 256 x eight bytes of EEPROM information memory
- Pin out compatible to the PIC16C73/74/76/77
- Eight level deep hardware stack.
- Direct, indirect, and relative addressing modes .
- Power-on Reset (POR).

B. A to D Converter

An associate degreealog to digital device is an electronic integrated circuit, that converts continuous signals to separate digital numbers. Typically, associate degree ADC is associate degree device that converts associate degree input analog voltage (or current) to a digital number. The digital output is also victimisation completely different writingschemes, like binary, grey code or 2 complement binary.

ISSN No: - 2456 – 2165

C. Sensors

A device that responds to a physical stimulation (as heat, light, sound, pressure, magnetism, or a specific motion) and transmits a ensuing impulse (as for activity or operating a control):a tool that responds to a physical stimulation(as heat, light, sound, pressure, magnetism, or a specific motion) and transmits a ensuing impulse (as for activity or operating an impact)

a). Temperature Sensor

Measurement of temperature adopts LM-35D module, which may be a temperature device with output in direct proportion to centigrade temperature. LM-35D has feature of low output impedance, with no peripheral parts, no ought to be adjusted. The temperature is controlled by gap and closing the clerestory, turning on and off the travel ventilator and with the assistance of cooling system. The LM35 series area unit precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature,. The LM35 so has a plus over linear temperature sensors tag in °Kelvin, because the user is required to compute an outsized constant voltage from its output to obtain convenient Centigrade scaling. The LM35 doesn't require any external activity or trimming to produce typical accuracies of ±1⁄4°C at temperature and ±3⁄4°C over a full −55 to +150°C temperature vary. Low price is assured by trimming and activity at the wafer level. The LM35's low output electric resistance, linear output, and precise inherent calibration create interfacing to readout or management electronic equipment especially simple. It will be used with single power provides, or with and and minus provides. because it attracts solely sixty μA from its supply, it's terribly low self-heating, but zero.1°C in still air. The LM35 is rated to control over a −55° to +150°C temperature vary, whereas the LM35C is rated for a −40° to +110°C vary (−10° with improved accuracy).

Fig 5: Pin diagram of Temperature Device LM35

b). Infrared Sensor

Infrared sensors realize various applications in electronic systems. unremarkably used as obstacle detector, their output is used in digital type (high & low logic) by using a comparator. this subject explains some way to use the sensor's output in its original analog type. Thus, along with detecting an obstacle, its precise distance can even be obtained. This is achieved by process the output of IR device through an ADC0804 (analog to digital converter). The ADC is Calibrated to urge nearly correct distance activity.

Infrared that we wish to sight with its internal photodiode sensor. The infrared detector conjointly has associate degree electronic filter that only permits signals around thirty eight.5 kilocycle to undergo. In other words, the detector is simply yearning for infrared that's flashing on and off thirty eight,500 times per second. This prevents IR interference from common sources like daylight and indoor lighting. daylight is DC interference (0 Hz), and indoor lighting tends to flash on and off at either a hundred or120Hz, betting on the most power supply within the region. Since one hundred twenty rate is outside the electronic filter's thirty eight.5 kHz band pass frequency, it's fully neglected by the IR detectors.

c). Heart Beat Device

Heart Beat device is perceived by employing a high intensity type LED and LDR. He finger is placed between the diode and LDR.As device a photograph diode or a photograph semiconductor unit will be used. The skin is also light with visible victimization transmitted or reflected lightweight for detection. The terribly little changes in reflectivity or in transmitted caused by the varied blood of human tissue area unit nearly visible. If any condition occurs it'll generate associate degree interrupt to the controller.

Fig 6: Heart Beat Device

IV. RFID IN HEALTH CARE SYSTEMS

RFID has sturdy application potential with medical device companies. The RFID system includes the hardware main components like (tags, readers and antennas) and therefore the software systems. RFID tags will be passive or active, depending on powering techniques. Passive tags will solely communicate with the reader after they area unit sitting in associate degree electromagnetic field of the reader since they are doing not have battery power; whereas active RFID tags will power the integrated circuits and broadcast the response signal to the reader. The RFID reader scans the tag and sends the tag information to the back-end information system that filters, analyses, and stores the information then passes on helpful information to alternative enterprise application systems for further processing. The information system will have multiple readers located in numerous places causing information through wired or wireless networks. Additionally, enterprise application systems, like hospital info systems (HIS) and supply chain management systems, will hook up with the middleware to retrieve tags info via security protocols. In tending, RFID systems area unit typically combined with alternative technologies like Bluetooth, mobile devices, and sensors for various functions. Passive RFID tags are primarily used for patient identification and drug authentication whereas active RFID tags area unit principally used for the tracking purpose. [9]

RFID are placed within the iMec system which will sight the expiry of medicines and misplace of medicines within the cases if any. digital camera adds interactive video to extend the speed of accuracy severally. It helps within the visual interaction with the patients spirited.

V. RESULTS

This paper proposes associate degree RFID and digital camera to reinforce the process of police work the living state of the recipient. RFID detects the misplace of the medicines within the cases and expiry of the actual drugs.

VI. CONCLUSION

This paper proposes associate degree RFID and digital camera to reinforce the process of police work the living state of the recipient. RFID detects the misplace of the medicines within the cases and expiry of the actual drugs. Digital camera technology is to visualize the patient conditions associate degreed it adds an interactive video in order to increase the accuracy. As future works it'll concentration the protection problems relating to the private health information

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