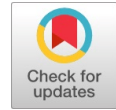# IoT-Internet of Things in Health Care ECG-Electrocardiogram & Medical kit by Connecting Doctor

B. Vijayendra Reddy, Rachit Garg, Vivek. V

Abstract: Nowadays present is the beginning of the future with new computing technology in IoT-internet of things consists of a sort of "universal global neural networks" in the cloud computing internet with connecting various devices and machines interacting with help of it we are going to do research in the medical field with help of "artificial intelligence"-AI check's automatically kept patients verified with help of sharp sensors and medical gadget blend. I have created IoT-architecture customized for health applications to improve the lifestyle of patients and to utilize the new various technology in different areas in every living organism. In this field two fields of easy monitoring with help of "ECG and medical-kit" any change in easy identification diseases and given treatment immediately on spot. While treatment will be given anywhere in the world located GPS-tracking and alert given to doctors & families etc. after treatment facilities given progress as per doctor consultations.

Keywords: IoT Applications, ECG- Sensors, Cardiac Pathologies, Artificial Intelligence-Ai.

I. INTRODUCTION

Man-made artificial intelligence has improved many alleviate migrates of many tasks and many new techniques and methods in the medical field present and future well developed than now. In the medical field many experts have been battling with medicine and electronic experiments to invite a new better treatment, with well-being effects (EHRs) and ECG, and in the medicine kit with the help of capacity technique, safety effort & access. The "Enormous information & artificial intelligence" main 3-issues can help out these 3-issues for analysis and treatment of patients and better precisions through the historical backdrop through examinations, AI can be glance back to patients design p as per records of medical treatment and discover that diseases recommended treatment as particular treatment in a correct way recovery back health person.

With AI-IOT usage healthcare industry increased, and the IoT's applications have been revolving around the initiatives of healthcare and care through remote monitoring of health patient's conditions. It will be tracking, monitoring & maintenance as per medical equipment. The IOT-based on health care services are expected to reduce the cost and improve the quality and user experience will identify the particular optimal time to add various devices like smooth and continuous operations. Identify recent health care trends like ECG and medical kits[1][17][18].

II. ARCHITECTURE OF HEALTHCARE IOT(HIOT-HEALTHCARE) INTERNET OF THING) WITH HELP OF ECG AND MEDICAL CARE:

The framework(designed) will be applied to health care in ECG and medical kit with help of applications aids IOT equipment & cloud computing (internet server) along with help of medicine kit available with the person for safety propose. The protocol will be given to a person by transformations the data to care person for treatment through network applications communications person for treatment connected through surrounding environment. The publisher or establisher arrangement of different components like system/ network to an IoT health care through sensors and other medical equipment, it records and stored the data of heartbeat like rate readings, temperature, oxygen saturations, ECG etc. It consists of the topology in H-IOT(HIOT) applications. It designed for real monitoring anywhere in GPRS or on earth which is connect to network area due to we can ambulance or we can treatment for treatment with his surrounding area without any delay we can protect the person. It can satisfy the treatment the requirement of healthcare providers.

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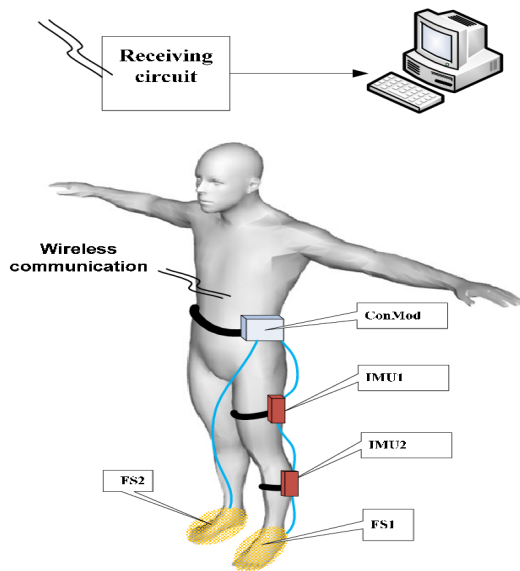
Fig. 1 Hardware Device Connected/Placed in Body Parts Devices Collected Data Through IOT-devices PC/Mobile Through Via Internet WI-FI Stored in Cloud Server and Monitoring

Hardware & software:

- RFID- "Radio Frequency Identification": it's used for short range communications (15cm-250cm) called as *tag & reader*. The *"tag"* is updated and connected like transferring the data connects from a microchip and antenna. It is used to identify the unique object /device (health care equipment) in the IoT-environment. The *"reader"* consists of the work on data formatted will be transferred/receives piece of information from the communications using tag object for using the different types of frequency waves like radio waves. In here ECG main used "electronic product code (EPC)". It helps to locate & track health care in our body through equipment we notice through mobile or laptop or system etc.

- Bluetooth- a little bit distance then RFID better short-distance wireless communication's it's used as UHF (Ultra High Frequency) like radio waves frequency. Its frequency is 2. 5ghz.We can communicate with a distance105m. We can transfer the data when connected to each devise. It's helpful to meet the requirements at demands.

- Zigbee: - It's useful to inter-connect the medical devices and transmit the data of information. The Zigbee frequency range is 2.4ghz more than the Bluetooth range. This range will contain the adoption of mesh network technology. The mesh network will ensure the interrupted connection among devices with other devices connected when it will be uninterrupted connections among other device even when fault in one or two devices. The main advantage is low power consumption, high transmission data rates, & high network capacity.

- Near Field Communication (NFC): The main concept of "NFC" contains the "Electromagnetic Inductions" which are useful for ECG.it help in antennas which is connected signal receive collect and transfer the data connect to show the result if they are any interrupted results will be an error. It will operate two nodes for data transmission

through a signal. Without pairing the data can't be transferred the data. [2]

Satellite: it's found to world international level anywhere it will be connected it is more powerful. Normally it's difficult to break the security level. The satellite receives a signal from the land surface of the earth through a satellite signal. The frequency is more than 2000mgz. In earth orbit satellites will rotate around for more.

III. HIOT (HEALTH CARE OF INTERNET OF THING) TECHNOLOGY:

It consists of a particular technology in IOT-system. It divides into 3-types of groups: -

A) Identifications technology
B) Communications technologies
C) Locations technologies

A. Identifications Equipment:

In this health system care an IOT-(Internet Of Things) designing the system to access the patient information from the authorized person node(sensor) from the doctor or operating person to remotely located through sensors identifications. Here mostly used the UID-unique identifier to authorize the entity to exchange the information's.2nd we are going to use the OSF-Open Software Foundation's has been updated the 2-different identifiers or disease related its name as UUID-universally unique identifier and GUID-global developed identify. Uuid is part of DCE-distributed computing environment without any help or requirements from centralized coordinates. In health care network consists the sensors & actuators to identify the Sensors & Actuators Identified & addressed for separately to help proper functioning the system[3].

B. Communication Technology:

it connect different entity in HIOT-network. It has 3-types of ranges like A. short-range, medium-range, and wide-range

A.LAN-local area network which consists of a short-range

B.MAN-metropolitan area network medium range as per the national level

C. WAN-Wide area network. Whole universal worldwide range.

It has communication base between stations and central node as "BAN".

In this field, the most preferred short-range communication it's easy to reach the hospital or reach the patience for treatment propose in this HIOT (health care-internet of thing) application to gets details about patient's health conditions. In earth orbit satellites will rotate around for more than 2000um frequency. The main advantage of satellites is the speed of data will be faster to communicate data transfer[4].
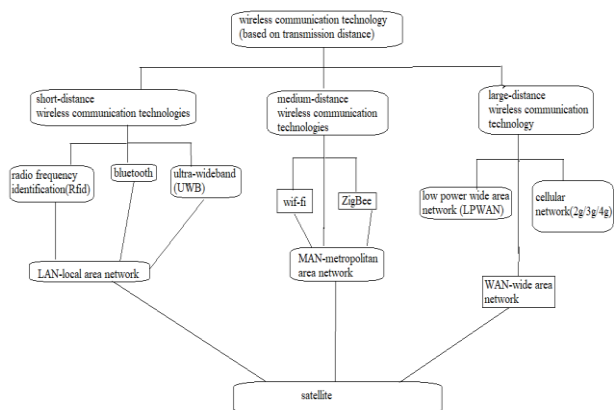
Fig: 2 Classifications of Communications Technology Used in Internet of Thing (IOT)Based Smart Farming

C. Location Technology:

The location is used to identify the exact place. For example, we can use "longitude and latitude" on the earth's surface we can identify easily with the help of "longitude and latitude". Earth surface global position system. Satellites keep tracking due to track the exact place detected the object as "GPS" system., we can use the google map to get directions to visit easy. There is a limited surrounding infrastructure that can act as an obstruction will be communication between the object & satellite. LPS-locations positions satellite used to track[5].

IV. SERVICES(BUSINESS) & APPLICATIONS OF HIOT-HEALTH CARE INTERNET OF THING: -

The advantage of IOT-technology useful for medical devices. It will support healthcare centers., For example, my topic has been taken as research work. It uses the more people can reach on the time and deliver excellent work. The application of more data will be stored in the cloud server. It will be communicated to the patients and doctors.

Doctors check the body's Emerging and new patterns while delivery while once again checking the heart position for any issues better without causes of any issues. The rhythmical ventricles and atria allow the heart to regularly pump the blood into the body of oxygenating the cells of the organ in general. Is this function of "Myoelectric" impulses to regulate to the heartbeat activity

An ECG- "Electro Cardiogram" will be recorded the electrical heartbeat activity. Heat beat will be recorded and monitoring and analyzed through an ECG waveform. Frequent monitoring will pose a risk to heart disease patients because it's simple to identify pulse rate through electrical activity and can provide helpful information on arrhythmias and heart disorders[6].
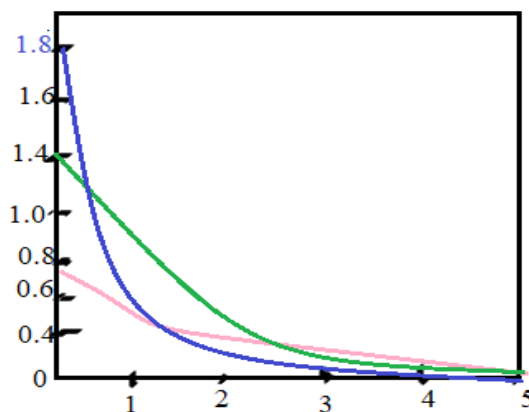

Fig: 3 Probability Density Curve for the Parameters that Were Measured.

The main problem in ECG systems the algorithm will gets correct or goes wrong. I mean true or false answers reading. A more suitable algorithm that will monitor the patient is recommended. The heart functions will be activated through cardiac functions will be functions by mythical "myoelectric impulse. The process done The likelihood density includes diseases that may result in long-lasting changes to the ECG waveform on a heart necrosis region.

The main target on the work to review the solution for describing the literature & commercially available devices to set up the laboratory useful for prototype. It will propose an IOT-solutions will be compresses in acquisitions of electrocardiographic (ECG) signal [7].
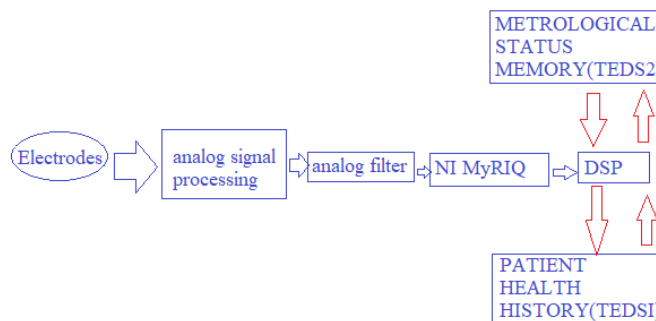

Fig:4 ECG System Architecture.

A. Business & Medical Services:

The comparison between the work and the solutions suggested in this study. demonstrates once more the fundamental capability of our ECG monitoring system to be modified by the diagnostic standards according to patient medical history.

They are used to getting the information of metrological on systems as a software or hard work on diagnosis reliability on finding another present research work comparison on current state of art[8].

B. Ambient assisted living (AAL):

it is related/connected to AI- "Artificial Intelligence" sure integrates with help of IOT and used for assisted elderly (old age time) people or comma patients at hospitals or homes/anywhere. These AI technologies contain the health care industries contain the big data analysis, machine learning-ML, & web applications.

It contains the 3-types of domains of AAL- "Ambient assisted living" A) Namely, B) Activity recognition, & 3) Their applications in the health care industry

A) Namely: identify a particular area displaying related disease

B) Activity recognitions: after identifying the disease we should start the treatment to give the best medicine for recovery of his/her health.

C)Application: After recovery health once we can check the health condition of the person due to all health conditions set…?

During implementation, we should design, framework, and architecture in AAL. The designing of the AAL's computerized communications and security architecture. While IPV6-based low-power wireless personal area networks were employed in some deployments, RFID & NFC were used in a communications protocol. The communications connected between patience and employee's device through smartphones, devices, and medical kits, etc[9].

C. Mobile-IOT:

The term "mobile IOT" or "M-IOT" refers to the integration of mobile computing, sensors, communications, and cloud computing with GPRS tracking for general information and health monitoring. It provides the communications of interface b/w the personal area network & mobile, tablet (4g,5g, etc) to provide internet-based on an efficient. The use of mobile will be used in "HIOT" access the service for more access the healthcare towards the "practitioner" who can be accessed anywhere towards the patients data, diagnose, & swiftly providers for treatment. They are several types of research working have been reported updated & stores in mobile computing in health care applications cloud server consists anywhere[10][19][20][21].

D. Wearable devices:

These help to patients getting information's from health care professionals & patients deal with various health problem at less money. They are many devices that are non-invasive & they can be developed by integrating various parts will be detect by the sensors with help of wearable accessories devices used by body organs wristbands. Necklaces, shirts, shoes, handbags, caps & so on…. They are sensors to be attached by used to collect pieces of information from the environment of the surrounding area and same as well as patient's health pieces of information. All pieces of information will be uploaded through an internet server stored in database[11].
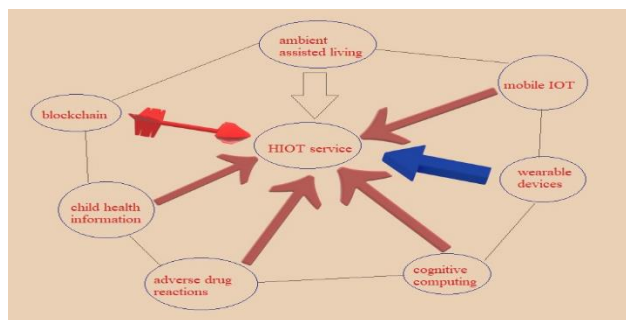

Fig: 5 widely used HIOT services

E. Community-based healthcare(H-IOT) services:

Its main cover the area means to say local area particular community. Such as private, and public companies, small residential areas, a hotel & so on residing areas. In a community-based network, various networks will be concatenated & can work cooperatively to give service with help of collaboration. An IOT is based on a cooperative for a medical network to set up will be provide health care monitoring in remote areas & to established by the security b/w the connections. The area consists of the based on a community network, various network connections can work together cooperatively to give services. In the medical community, a network was proposed as a "virtual hospital. This provides to be helped to medical facilities for the needy from a remote location. It can be designed as a framework that has been sharing health pieces of information that involve the medical records of the patients[12].

F. Cognitive computing:

it refers to the whole process of the brain and body's main sensor of neurons and blood passing from pumping hearting passing various parts. With advances in sensors technology &artificial intelligence, IOT devices may help the integrated with help of sensors it can be mimicked by the human brain for solving every problem. An IOT device system helps in the analysis of the hidden patterns of the body's heat or heart process to get the information is everything will be stored large data. Cognitive computing will be connected to the IOT devices network, and all sensors collaborate with other smart gadgets & provided efficient health services. The use of cognitive computing in an IOT-systems will be bits of help patient's data & provide proper treatment for healthcare providers the perfect makes an effective observation of patient's data & provided proper treatment[13].

G. Medical treatment through "Adverse Drug Reactions (ADR)":

An "Adverse Drug Reactions"-ADR identified the side effects while taking medications takes the medical treatment. These reactions will take place in one dose or long-term process in the administration process in the medical health care center. These ADRs can be given to 2-different types of medicine-related health issues at the same time it's possible. It will vary from person-to-person due to ADR doesn't need medical treatment or disease related to body or mentality[14].

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A normal heartbeat will be 72-pulsating and in ordinary circumstances heartbeat between 60 to 100 thumps for each min (BPM). The distinction in a heart pulsating quicker in circumstances of actual work like pressure, feelings, and so on. Presently a day's a great many people are getting significant medical problems like significant cardiovascular failures, trance state patients, mishaps, medical procedure in clinics, and so forth experiencing different illnesses by breaking down the patient's exercises. We can utilize innovation to save the patient's life on the spot anyplace we can make it quicker to save anyplace by utilizing innovation like IOT-gadgets recognize the infection and distributed computing for data gathering we can act from wellbeing focuses right away. We can operate through a laptop/system or mobile, sometimes send through mail to prescriptions with unique id and passwords approaching server, advised through email. It helps to connect between doctor and patient system sending the real-time data and his record for future reference. It helps to give proper treatment and efficient medical service[15].

V. CONCLUSION

In while detecting electrical wave showing in monitoring, we can easily identify the issue solve the issue on spot treatment will be given through medical kit as temporary solved until reached hospital. It detected health problem related conditions of body issue we can identify and solve through monitoring reading. Here condition of heart functions and body temperature will be upload reading and stored the data in cloud server due to next treatment analysis & to improve the health issue previous records. It will be "AI-Artificial Intelligence" observe the live monitoring 24*7 continue gives alert to doctor immediately given treatment to save the patient example coma, road accident, heart attacks etc. It helpful anywhere through connecting IOT-device's new devices like tab, mobile, laptop etc, what condition live and be prepare without late. Without late near hospital located & track locations of patients[16].

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Authors Contributions	All authors having equal contribution for this article.

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