



Department of Electronics & Communication Engineering

GOVERNMENT POLYTECHNIC FOR GIRLS, SURAT

Sep -2020: Vol.-6

EC TRENDS

E-Newsletter



Vision:

Be an excellent department for girls to empower them in the field of Electronics and Communication engineering to excel in industry and serve society.

Mission:

- To prepare professionally competent students and staff through academic excellence.
- To create a conducive environment in the department for exchange of ideas and knowledge.
- To provide opportunities in the department for skill development and innovation.
- To provide resources and infrastructure for best learning experience in the department.

Message from Head of Department



Dr. S. N. Sampat
Head of the Department Electronics and communication
Engineering. ,
(I/C principal ,GPG .surat)

Dear students,

With warm greetings from the government polytechnic for girls, Surat, I start this announcement with tremendous gratitude for every students of our department GPG, surat, most especially for your patience and understanding, as GPG, surat has to plan for the online mode learning in the age of COVID-19.

It is also worth noting that, whether we started the year remotely online or in person on campus, we have intended to present our academic program in the clearest, most predictable, and reliable manner as possible in order that our students and their teachers could settle into a consistent routine.

Greater details by which we have been planning to bring that goal to reality were also shared with the community by the Principal sir and our Head of the department meetings so that faculty, staff, parents and students could gain better understanding about their carrier after diploma.

Thank you to all who were able to participate in the meetings, complete the survey and communicate with me or other staff about how best to navigate our way forward in these uncertain times. The community has conveyed its strong preference to remain in the safety of remote learning at home.

Remember that every student will be dealing with the stress of the ongoing crisis differently. Thank you to all Students of department as they also have created a supportive and nurturing environment and responded positively to questions and expressions of their classmate.

I believe that we have done and will continue to do our very best. All students keep themselves healthy and with safety keep continue to learn for the online mode learning in the age of COVID-19.

TECHNOLOGY AND FUTURE OF HEALTH CARE



MS. K. R CHAUDHARI

Lecturer, Department of Electronics and communication Engineering

email: gpgseckrc@gmail.com.

What we are approaching is a world where basic healthcare would become out of reach to most people, While technology can't stop the population from ageing diseases at once, it can at least make healthcare easier on a pocket and in term of accessibility.

Technology can move the routines of medical checks from a hospital (hospital-centric) to the patient's home (home-centric).

TECHNOLOGY IN HEALTH CARE

While all three of these technologies deliver standalone functionality, each has the potential to interact with either or both of the other two. Paradoxically, this complementarily arises from the fundamentally different characteristics of each of the three technologies.

I. BLOCKCHAIN TECHNOLOGY

The Blockchain is a revolutionary technology and distributed ledger platform that allows information to be shared — but not copied — across a series of networks. The technology removes the need for a centralised owner making it near impossible to fraud the information in the chain (as all nodes within a very long sequence of transactions would need to be tampered with). If there is any information that does not match the previous block, the whole transaction will be void.

II. ARTIFICIAL INTELLIGENCE (AI) TECHNOLOGY

Artificial intelligence, on the other hand, is task-specific software with the ability to modify the way its algorithms perform as a result of previous outcomes. This is sometimes called “machine learning” although this just is one sub-field of AI which sits along other methodologies such as artificial neural networks. The result is the software – or the devices and machines in which it is embedded – seems to be imbued with intelligence. The operative word here is “seems”, although the degree of sophistication already achieved by advanced AI systems can now outperform the results of expert human counterparts.

III. INTERNET OF THINGS (IOT) TECHNOLOGY

Internet of Things is a network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment. Nest, Apple Watch and your smartphone are all part of and vectors for the IoT.

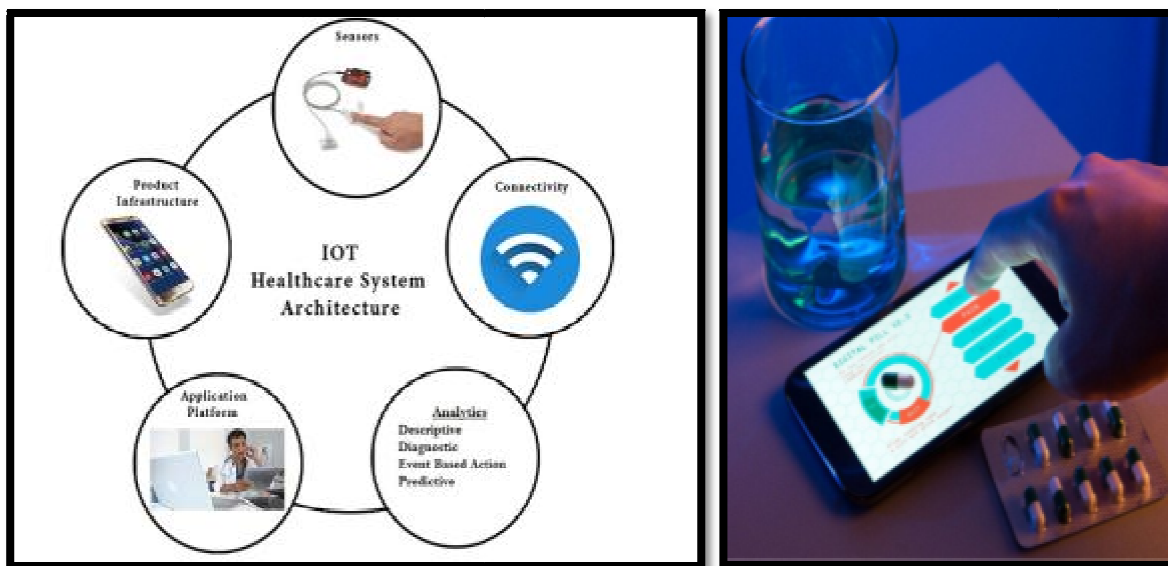
The bringing together of Blockchain, AI and IoT is still largely in the development stage but there are already a significant number of real-world examples of combinations of the three technologies.

All three of the new technologies will bring about major changes in the way work and processes are carried out, with the elimination of whole swathes of activity previously carried out by humans or the activity being carried out by smart machines, bots or smart processes.

IV. INTERNET OF THINGS (IOT) IN HEALTHCARE

IoT technology brings numerous applications in healthcare, from remote monitoring to smart sensors to medical device integration. It keeps the patients safe and healthy as well as improves the physician delivers care towards the patients.

Healthcare devices collect diverse data from a large set of real-world cases that increases the accuracy and the size of medical data.



CURRENT HEALTH CARE ISSUE:

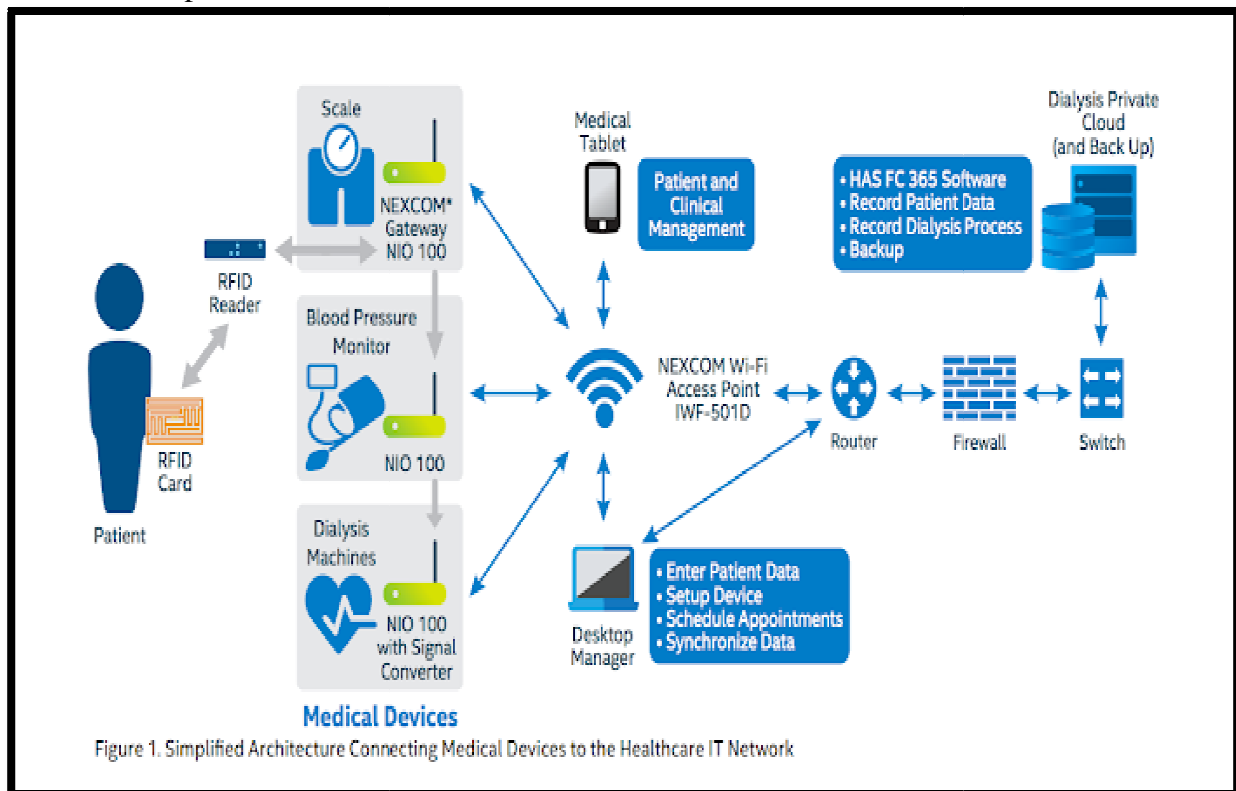
- ❖ A large section of society would go unproductive owing to old age and people would be more prone to disease.
- ❖ Basic healthcare would become out of reach to most people.
- ❖ Medical diagnostic consumes a large part of hospital bills.
- ❖ The right diagnosis not done by hospital.

SIMPLE IOT BASED HEALTHCARE SYSTEM ARCHITECTURE

The application of the Internet of Things (IoT) in healthcare transforms it into more smart, fast and more accurate. There is different IoT architecture in healthcare that brings start health care system.

- ❖ **Product Infrastructure:** IoT product infrastructure such as hardware/software component read the sensors signals and display them to a dedicated device.

- ❖ **Sensors:** IoT in healthcare has different sensors devices such as pulse-oximeter, electrocardiogram, thermometer, fluid level sensor, sphygmomanometer (blood pressure) that read the current patient situation (data).
- ❖ **Connectivity:** IoT system provides better connectivity (using Bluetooth, WiFi, etc.) of devices or sensors from microcontroller to server and vice-versa to read data.
- ❖ **Analytics:** Healthcare system analyzes the data from sensors and correlates to get healthy parameters of the patient and on the basis of their analyze data they can upgrade the patient health.
- ❖ **Application Platform:** IoT system access information to healthcare professionals on their monitor device for all patients with all details.



The IoT device collects and transfers health data: blood pressure, oxygen and blood sugar levels, weight, and ECGs. With IoT sensors getting smaller and more advanced, it means they can be applied to various medication instruments and products, such as inhalers, syringes and pill packets. The sensors can detect when the medication has been taken, for example, through distinguishing when an inhaler has been used, or a pill packet has been opened.

With real-time monitoring of the condition in place by means of a smart medical device connected to a Smartphone, connected devices can collect medical and other required health data and use the data connection of the Smartphone to transfer collected information to a physician. The data can be collected, analysed and communicated back to the patient, relative, doctor or medical professional.

Patients that are found to not be adhering to their recommended treatment regime can receive encouragement to follow their treatment programme more accurately by providing them with more individualised information on their therapy. As well as empowering patients and relatives to take more ownership of their own treatment it can lead to more independence for patients, better treatment, more effective drug development and ultimately lower healthcare costs.

Data collected opens the door for increasingly individualised treatment programmes. For example, rather than a simple update stating you have taken eight out of ten tablets today, there is an opportunity to educate the patient on the effect those tablets have had e.g.: “you’ve reduced your chances of getting better by 20%”.

These individualised messages will not only educate patients but also likely make more of an impact than the generic reminders.

These data are stored in the cloud and can be shared with an authorized person, who could be a physician, your insurance company, a participating health firm or an external consultant, to allow them to look at the collected data regardless of their place, time, or device. Center of Connected Health Policy conducted a study that indicates that there was a 50% reduction in 30-day readmission rate because of remote patient monitoring on heart failure patients.

This information can be used to monitor in real time the state of a patient or to get sensitive data in order to be subsequently analysed for medical diagnosis. If real time image diagnosis is needed a camera can be attached to the 3G module in order to send photos and videos of the patient to a medical diagnosis center.

Data can be sent to the Cloud in order to perform permanent storage or visualized in real time by sending the data directly to a laptop or Smartphone. iPhone and Android applications have been designed in order to easily see the patient's information.

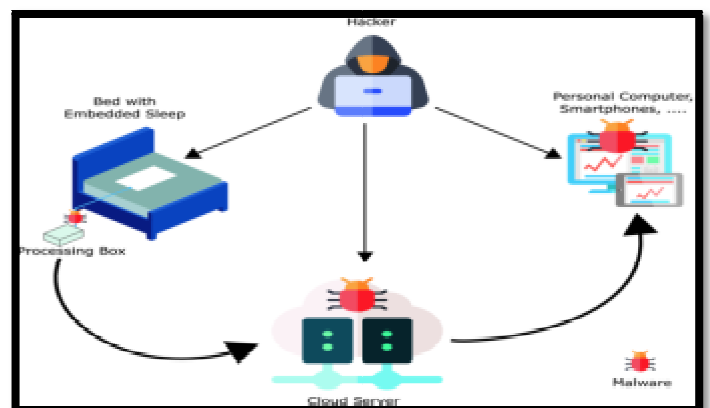
FACTOR AFFECTING IOT HEALTHCARE APPLICATION

There are various factors that affect the IoT healthcare application. Some of them are mention below:

- ❖ **Continuous Research:** It requires continuous research in every field (smart devices, fast communication channel, etc.) of healthcare to provide a fast and better facility for patients.
- ❖ **Smart Devices:** Need to use the smart device in the healthcare system. IoT opens the potential of current technology and leads us toward new and better medical device solutions.
- ❖ **Data security & privacy:** One of the most significant threats that IoT poses is of data security & privacy. IoT devices capture and transmit data in real-time.

However, most of the IoT devices lack data protocols and standards. In addition to that, there is significant ambiguity regarding data ownership regulation.

All these factors make the data highly susceptible to cybercriminals who can hack into the system and compromise Personal Health Information (PHI) of both patients as well as doctors. Cybercriminals can misuse patient's data to create fake IDs to buy drugs and medical equipment which they can sell later. Hackers can also file a fraudulent Insurance claim in patient's name.



- ❖ **Integration: multiple devices & protocols:** Integration of multiple devices also causes hindrance in the implementation of IoT in the healthcare sector. The reason for this hindrance is that device manufacturers haven't reached a consensus regarding communication protocols and standard.

So, even if the varieties of devices are connected; the difference in their communication protocol complicates and hinders the process of data aggregation.

This non-uniformity of the connected device's protocols slows down the whole process and reduces the scope of scalability of IoT in healthcare.

IoT in healthcare enables interoperability, machine-to-machine communication, information exchange, and data movement that make healthcare service delivery effective. Connectivity protocols: Bluetooth LE, Wi-Fi, Z-wave, ZigBee, and other modern protocols, healthcare personnel can change the way they spot illness and ailments in patients and can also innovate revolutionary ways of treatment.

- ❖ **Data overload & accuracy:** IoT devices can collect report and analyses the data in real-time and cut the need to store the raw data. Moreover, a healthcare operation allows organizations to get vital healthcare analytics and data-driven insights which speed up decision-making and is less prone to errors. This all can happen overcloud with the providers only getting access to final reports with graphs.
- ❖ **Cost:** Consequently, technology-driven setup brings up the cost increase but at the same time by cutting down unnecessary visits, utilizing better quality resources, and improving the allocation and planning.

Following are the immediate benefits we can notice from IoT integration:

- ❖ Real time data capture.
- ❖ No requirement of constant monitoring.
- ❖ Easy notifications and alert generation even remotely in emergencies.
- ❖ Slightest change in the health condition can be monitored.
- ❖ Analysis of the data generated is very easy.
- ❖ Reducing Emergency Room Wait Times
- ❖ Remote Health & Monitoring
- ❖ Ensuring the Availability and Accessibility of Critical Hardware
- ❖ Tracking Staff, Patients and Inventory
- ❖ Enhanced Drug Management
- ❖ End-to-end connectivity and affordability
- ❖ Tracking and alerts

Nanotechnology in healthcare

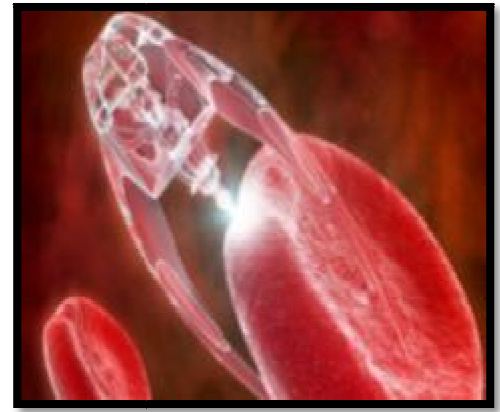
Nanotechnology is becoming a crucial driving force behind innovation in medicine and healthcare, with a range of advances including nanoscale therapeutics, biosensors, implantable devices, drug delivery systems, and imaging technologies.

The advances in miniaturised sensors and machine learning fuel the possibilities of mobile healthcare applications, where these medical internet-of-things (M-IoT) devices are body-worn or implanted for continuous vital signal recording. As bio-signals extracted from the human body are embedded with a plethora of information where most of them are unobservable to the human eye or even experts, advanced machine learning techniques play an important role to mine such information from the bio-signals. Such information is helpful for the general public to undergo follow-up health condition

analysis and diagnosis. The importance of signal processing methods for the removal of noise should also be integrated into these M-IoT devices to increase the reliability of measurements provided.



For mobile health-care applications, battery life of over one week should be of the minimum requirement to promote the seamless deployment of such a solution. Design considerations, such as portability and user-friendly interface have to be integrated into such devices to meet the expectations of the general public. As meta-information concerning bio-information is transmitted via a wireless medium (Bluetooth and Wi-Fi), data security plays a crucial role in such devices. Biometric identification is introduced to add an extra layer of security to this device.



Nanoparticles and nanodevices will soon operate as precise drug delivery systems, cancer treatment tools or tiny surgeons. For example, researchers from the Max Planck Institute have been experimenting with exceptionally micro-sized – smaller than a millimetre – robots that literally swim through bodily fluids; and could be used to deliver drugs or other medical relief in a highly targeted way.

Future Scope:

IoT for healthcare can also be used for research purposes. It's because IoT enables us to collect a massive amount of data about the patient's illness which would have taken many years if we collected it manually. This data thus collected can be used for statistical study that would support the medical research.

Thus, IoT don't only saves time but also our money which would go in the research. Thus, IoT has a great impact in the field of medical research. It enables the introduction of bigger and better medical treatments. Technology has always been a major driver in any business where companies need to integrate technology effectively to succeed or even sustain their place in the marketplace.

We can conclude that opportunities are almost everywhere in every industry. The combination of leveraging IoT, generation of big data and predictive analysis by AI will unleash amazing ideas and opportunities.

REF :

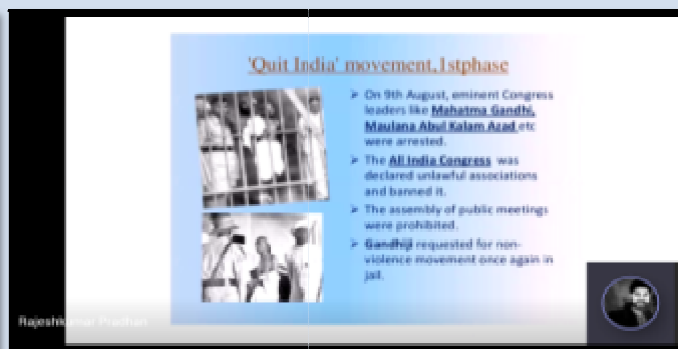
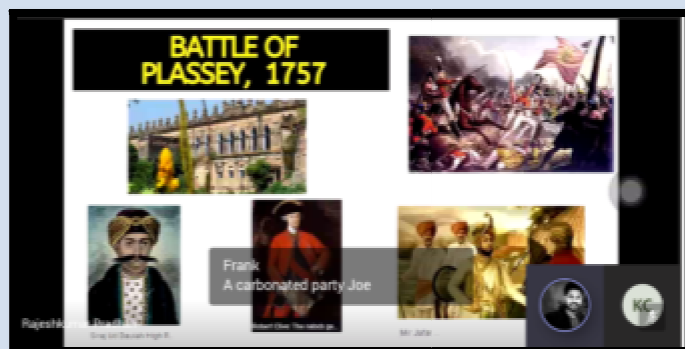
- 1) <https://www.javatpoint.com/iot-healthcare>
- 2) <https://addonwebsolutions.com/iot-in-healthcare-industry>
- 3) <https://www.peerbits.com/blog/internet-of-things-healthcare-applications-benefits-and-challenges.html>
- 4) [https://en.wikipedia.org/wiki/Monitoring_\(medicine\)](https://en.wikipedia.org/wiki/Monitoring_(medicine))
- 5) https://www.businessinsider.in/science/news/iot-healthcare-in-2020-companies-devices-use-cases-and-market-stats/articleshow/74126142.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst
- 6) <https://sites.google.com/site/160102846b/iot-application-areas-in-our-daily-life-2-1>
- 7) <https://medicalfuturist.com/20-potential-technological-advances-in-the-future-of-medicine-part-ii/>
- 8) www.scind.org
- 9) https://link.springer.com/chapter/10.1007/978-3-030-32785-9_1
- 10) <https://www2.deloitte.com/us/en/insights/topics/analytics/predictive-analytics-health-care-value-risks.html>

EVENTS OF THE MONTH

On 15 August, the auspicious occasion of 74th Independence Day Dr. S. N. Sampat I/C principal, GPG, surat have done Flag hosting at GPG, surat campus.



A webinar on the topic “Know History to Create History “ has been arranged for all students on the auspicious occasion of 74th Independence Day. The Indian independence movement was a movement from 1857 until 15 August 1947, when India got its independence from the British Raj. The movement spanned a total of 90 years (1857–1947). In this webinar, all the important timeline of Indian independence was discussed in order to aware all the students regarding the sacrifices of our great Indian freedom fighters. Students have realised their great efforts and promised to do great in their life.



STUDENT CORNER



PANDEY ANSHU SANJAY

Enrollment No. : 1861503 11022 (Fifth Semester)

Department of Electronics and communication
Engineering

" Zindangi "

Chal mere dost zindangi jeene ki aaj ek nayi wajah dhudhte h . . .

Chal hasne ki koi wajah,

Or gam ko dafnane ki qabar dhudhte h . . .

Bohot ker li shikayate... Dusro se

Ab khud ke liye thodi rihayate dhudhte h . . .

Chal mere dost zindangi jeene ki aaj ek nayi wajah dhudhte h . . .

Bohot dekh liya chand ko...

Aaj sitaro ko pane ki chah rkhte h . . .

Chal aaj fir wahi khusiyo wala bachpan dhudhte h . . .

Chal mere dost zindangi jeene ki aaj ek nayi wajah dhudhte h . . .

Bohot waqt guzara h andheri raato me . . .

Chal aaj andheri ratoo se hum ek nayi subah dhudhte h . . .

- By pandey anshu

