



Internet of Things (IoT) in Healthcare

Siddhartha Roy*

Department of Computer Science, The Heritage College, Kolkata, India

***Corresponding Author:** Siddhartha Roy, Department of Computer Science, The Heritage College, Kolkata, India.

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Introduction to IoT

One of the most important things in the present (and future) which has made our daily lives a lot easier is THE INTERNET OF THINGS. Whether watching Netflix on a Saturday night or using a mobile to turn on the ac remotely for a smart home application, everything in today's world is based on IoT, which is basically a concept that expands the internet to all devices where a connection can be established. It's all done using sensors in devices, it can be a smart car providing the shortest route or a smartwatch tracking daily. IoT can be extensively used to improve the production of a factory or make parking easier, or monitor patients' personal health IOT provides a common language for all these devices to communicate with each other.

IoT in Healthcare:

Healthcare is a crucial application domain of IoT. At present various IoT-enabled healthcare devices are used worldwide for the diagnosis of a patient's disease and monitoring health conditions. In fact, IoT-enabled healthcare systems revolutionized healthcare and improved the quality of life in developing nations. We can view IoT applications of healthcare from three different perspectives, which are discussed below.

- **IoT for Patients:** Digitization and standardization of healthcare data which can be accessed through various registered hospitals. The IoT-enabled devices and other wirelessly connected devices like monitoring of heart rate, blood pressure, etc. give patients access to custom-made attention. These devices can be tuned to remind calorie count, exercise checks, appointments, blood pressure variations, and much more. For any routine task of patients, the alert mechanism sends signals to the health care service provider as well as the patients' party.

- **IoT for Physicians:** With various home monitoring equipment embedded with IoT, physicians can keep track of patients' health more effectively. Data captured from various IoT devices can help doctors the best treatment process for patients. Real-time data namely, glucose and blood pressure help physicians to analyze past treatments, diagnose symptoms, and improve continuing disease management.
- **IoT for Hospitals:** IoT devices tagged with sensors are used for tracking various medical equipment such as nebulizers, oxygen, defibrillators, and pumps, and other monitoring equipment in real-time IoT devices also help in asset management like environmental monitoring, pharmacy inventory control, and, checking room temperature, and humidity and temperature control.

One of the major advantages of healthcare IoT is that it always operates in real-time mode, which is very much essential for completely dynamic systems such as the availability of doctors and beds in a hospital, medical facilities with their charge, etc, Another advantage is that an authorized user can easily find the availability of the bed through the web-browse-based portal without visiting the hospital physically. Moreover, the IoT-enabled healthcare system keeps all patient's histories in a safe environment which helps doctors to diagnose patients correctly.

Though IoT has various advantages in a smart healthcare system there are multiple risks associated with it. An IoT-based healthcare system consists of various sensors that transmit sensed data to a centralized unit. Intermittent connectivity may result in a life-threatening situation for the patients. Another crucial issue is a security risk. The risk of tampering with data and unauthorized access is very common. Moreover, the management of huge

data is a crucial task for IoT-based systems as doctors may wrongly diagnose a patient with erroneous patient data which may be life-threatening to the patient. It is a challenging task to produce an error-free IoT-based healthcare system.

Conclusion

The whole world is interconnected with each other your smart-phone, but in reality, only about 5% of the physical world is connected. There are billions of IoT devices but they are used, by a handful of people right now. But by 2025, every person is going to have their lives solely based on IOT, be it in the field of security, home appliances, hospitals, transportation, drainage, traffic management, shopping, buildings, or industries, IOT has made a remarkable change. Thus, the future of IoT is virtually unlimited and it has the capability to dramatically increase its role in the smart world to make our lives a lot easier and better. Some of the issues like security, and erroneous data should be carefully handled to predict diagnosis correctly.