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# A Survey Paper on Internet of Things Based Healthcare System

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**Abstract:** IOT is the advanced network infrastructure of connectivity, transportation and technology. IOT smart devices can implement the facilities of remote health monitoring and also emergency notification system. IOT has appreciable application of smart healthcare system. In the healthcare system the highlighted policies and strategies that help to the researchers and scientists and experts who develop smart device which is the up-gradation to the existing technology. This survey paper states that how IOT interrelate to various system including the smart healthcare which is one of the prevalent system. Healthcare system has the surveillance that proposed the need of smart devices and smart objects to decrease the inefficiency of available healthcare system. The IOT based healthcare has enhanced technology which is exclusive from the traditional healthcare and whole medical system.

**Keywords:** Internet of Things (IOT), Surveillance, Smart Devices, Smart Healthcare

## 1. Introduction

This paper incorporates the webbed human health services and that has the entire base of internet of things. Kelvin Ashton's proposed Internet of things is an idea mirroring an associated any arrangement of anybody, anything, anytime, anyplace, any service, and any network. IOT administrations organize correspondence for framework devices and administration that supersede the edges of machine to machine mechanism. IOT enables the object to be sensed to control that creating opportunity for direct integration of physical world into computer based system performance, meticulous and economic benefits. In the following figure 1, how widely the IOT has been deployed in health care system and there importance is shown [9].

## 2. Related Work

1. Intelligence wallet for a person to store signals and wallet shares [6].
2. For elderly or chronic patients a few sensors have developed for human activity observing system. The part of this framework is the consistent observing of physiological parameters [5, 1].
3. Health care monitors system is mostly depend on wireless sensor network that's why it gives advantage of reduced energy consumption and extend the communication coverage [4].
4. Developing countries have to face the problems like less innovated technology, least availability of smart devices and smart object which is the prevalent need of smart healthcare [7].
5. Developing devices like heart observing gadgets utilizing remote sensors and advanced mobile phones. It recognizes the undermining arrhymains when it comes to at the specific threshold value esteem its caution alarms to patient [2].
6. Applying IOT for personalized health care in smart homes gives service and technology of layered approach [6].
7. Approach of IOT is an IOT aware architecture for

smart health system using sensors like temperature sensors, barometric pressure, and ECG sensor. It gives facility like remote monitoring and management of emergency situations [8].


***Figure 1.*** *Internet of things and healthcare.*

## 3. IOT-Health Care

Smart servers fix time and passing data to the smart backbone. In current existing health care system due to lack of awareness, poor facility with undeveloped technologies it needs the smart health care system. With the help of advanced network system doctors can monitor and provide the required services for patients remotely. Using smart phone applications related to health care system patients may get guidance to take decisions suggested by the doctors. IOT allows tagging any patient and able to get health care information by the address or database corresponding to particular RFID (Radio frequency identification). RFID automatically identifies and tracks the tag attached to objects by using electromagnetic fields [1]. The health care mainly issues on diagnosis treatment, health professionals and policies added to that the medicinal concerns and public health. The particular health system refers to organization of people institutions and resources to deliver health care service to meet the need of smart healthcare. The smart health care system based upon IOT includes ehealth and smart devices as tool of up-gradation and future smart healthcare technologies too [5].

## 4. Healthcare Surveillance

The smart health care system encounters the smart health disease surveillance. Categorised of this surveillance are mainly smart IOT devices and smart backbone devices. This conclusively serves the mechanisms of cloud computing and main servers at the hospitals. Personal Survey and an international response followed by overall public health by World Health Organization (WHO) that has announced plans to establish the Disease Intelligence Unit that will function independently. The trends and analysis have reached the backbone network that is the prevalent need of today. Smart diseases surveillance is extreme novel and innovation to speed up the existing process of surveillance to reach the highest goals of accuracy and real-time database. Smart disease surveillance is an epidemiological practice by which outbreak and spreading can be monitored. Main role is to predict and to observe to minimise harm to the lives. Modern communication technology includes organisation like world health organisation WHO and centres for disease control that now can report with enhanced and advanced application like “smart grid” and smart devices like heart monitoring, biochip, transponders, etc. [7].

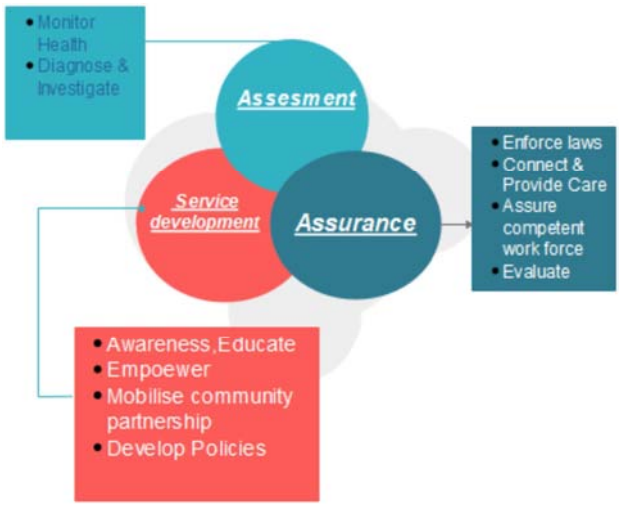


***Figure 2.*** *System management in smart healthcare.*

In the above figure 2, different management services that are essential in healthcare are shown and Surveillance has the common outcome those developing countries have such as the INDIA has Quality assessment perspective population level consideration problems [4, 10].

## 5. Worldview of Smart Hospitals

In figure 3, general Architecture of IOT based health care is shown which generally consists of three layers as follows:

A. Recognition layer

B. System layer

C. Application layer

Figure 4, shows the LOGICAL STRUCTURE to develop a way to access the information from portable platform built on medical personnel and administrative personnel. Every user can allow accessing of this integrated information depending upon its score roll through this platform [6, 2].

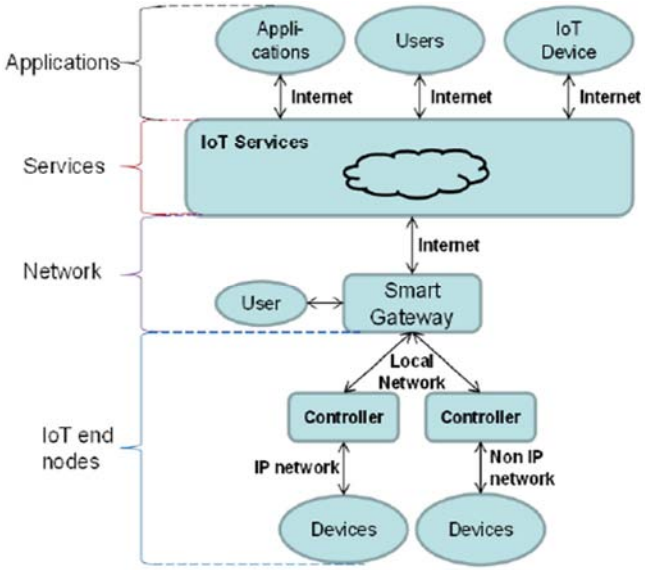


***Figure 3.*** *Architecture of IOT based healthcare.*

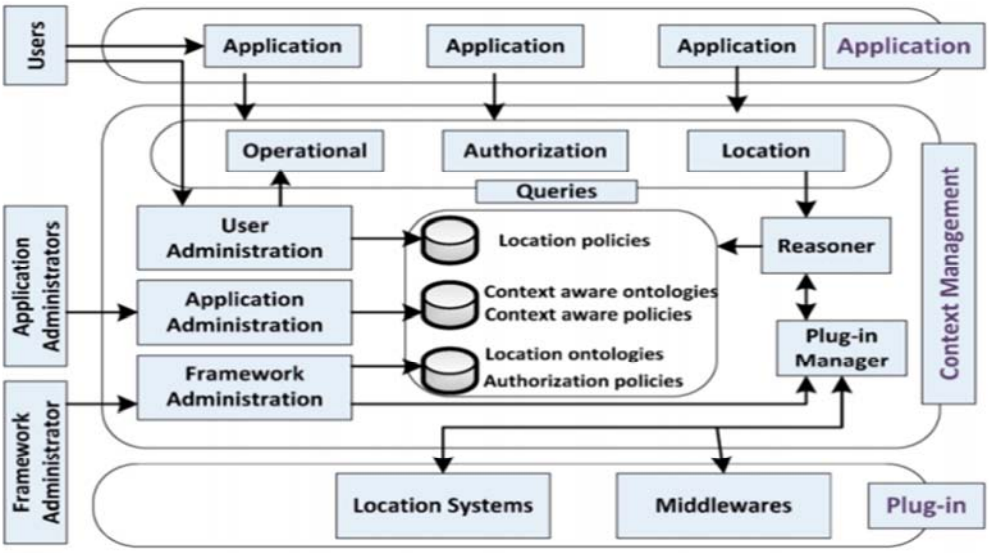


***Figure 4.*** *Logical structure of smart healthcare.*

## 6. Keen Devices

IOT is progressively being perceived by specialists and expert as a standout amongst the most sophisticate innovation that has the capability of development. It comprises of sensors, actuators, processing gadget and information correspondence abilities. It upgrades propel medicines and analysis that has enhanced radically. Smart devices are utilized to treat the issues like chronic disease management, personal health and fitness management. In figure 4, Different smart medical monitoring devices with IOT technologies are discussed in [3].

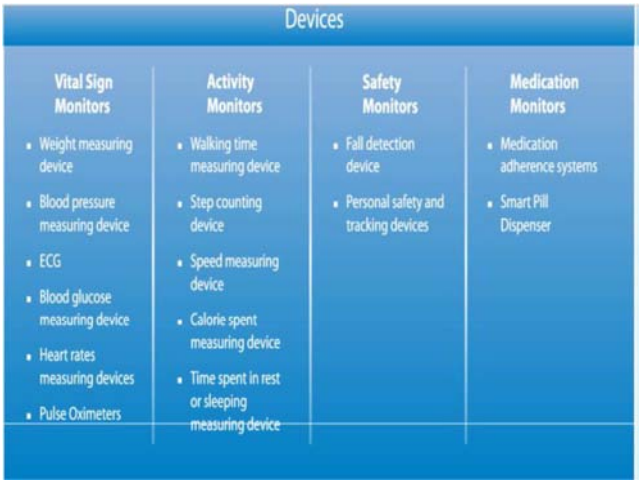


***Figure 5.*** *IOT technology – smart medical devices.*

INTERNET OF THINGS – MEDICAL DEVICES

1. Access real-time visibility about overall patient condition.
2. Address the immerging challenges in Smart health care services.
3. Managing gadget differing qualities and interoperability (like fringe region organize).
4. Integrating data that has understood intelligent application like correlation complex event Processing and automated reasoning with semantic technology.
5. Maintaining productivity, adaptability and transformative applications by examining regular "Big data" issue, speed of information ingestion also stringent constant execution and devoted reason developed applications.
6. Serves medical master lines or proficiency by providing features like Data securitization, Scale volume data, Patient-device Interaction, etc [5].

## 7. Conclusion

1. Smart medicinal services framework has improved components because of IOT. Insight of work has been gaining with the assistance of premises of IOT.
2. Health care system has minimized complication and complexity with the environment of IOT.
3. All the predictions that we got from the survey of whole medical system are un-prosperous maintenance and unutilized technology.
4. This problem is overcome by full-fledged utilization of upgraded and new generation technology.
5. Evolving the smart healthcare devices is a possible approach to control existing medicinal services.
6. Intensification of awareness of smart diseases and implementation of government schemes to improve quality of life.

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