Internet of medical things (IoMT) – A review article.

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Abstract

The Internet of Medical Things (IoMT) is assisting in the improvement of electronic equipment's accuracy, dependability, and productivity in the healthcare industry. Researchers are assisting in the creation of a computerized healthcare system by combining existing medical resources and healthcare services. Our focus is on the research contribution of IOT in the healthcare industry, despite the fact that IOT converges several domains. We anticipate that this work will be useful to academics and practitioners in the field, supporting them in grasping the immense potential of IOT in the medical sector and addressing critical IoMT challenges.

Keywords: Physiotherapy, Medical things, IoMT challenges, COVID-19.

Introduction

The Internet of Medical Things (IoMT) is defined as the application of the well-known Internet approach's fundamentals, principles, tools, techniques, and concepts to the medical and healthcare sectors and domains. It took all of our efforts to create a workable network of services so that available healthcare resources and diverse medical services could be linked through the most advanced applications of internet-based gadgets. When medical services are required to deliver in some remote places, the proposed IoMT concepts play a critical role. The implementation of IoMT concepts and techniques has transformed healthcare, medical operations, and services. The Internet of Things (IoT) is a network of interconnected devices and processes that includes all network elements such as software, hardware, network connectivity, and any other electronic or computer means that makes them responsive by facilitating data exchange and compilation.

The proposed IoMT concept provides solutions and treatments to these issues involving orthopedics patients by combining advanced technology and intelligent machine learning-based approaches to provide fruitful proposals for orthopedics patient treatment, particularly in the context of today's COVID-19 pandemic. Apart from the success and advantages of the suggested IoMT technique in alleviating orthopedics concerns, there are several challenges to overcome while adopting this concept in treating pandemic survivors. The main backdrop to build this solution is based on an effective cloud-connected database, therefore security considerations are a challenge. Interoperability, in addition to data security, is a problem during IoMT operation.

The necessity to build a dynamic, integrated framework to connect these advanced digital facilities with medical facilities and services will always exist. The Internet of Things (IoMT) has a number of vital applications for preventing epidemics and pandemics. The capacity to give medical services in a remote location, online and onscreen checks, report analysis, database sharing, information processing, and overall patient tracking and monitoring are some of the primary uses of IoMT. Some of the specially developed features from IoMT services for older patients include remembering feature devices to keep them reminded about certain acts such as medication, medicine timings, sleeping level monitoring, and so on.

The IoMT can help orthopedic surgeons manage their work in clinics and hospitals by providing administrative and clinical duties. It can be used to conduct telemedicine consultations from a distance. In hospital administration, IoMT can be valuable for tracking and monitoring assets such as high-capital-value instruments and implants, as well as inventory management. Determining the productivity and efficiency of staff; improving the hospital's patient flow management and recognizing concerns. The Internet of Things (IoMT) has a number of vital applications for preventing epidemics and

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pandemics. The capacity to give medical services in a remote location, online and onscreen checks, report analysis, database sharing, information processing, and overall patient tracking and monitoring are some of the primary uses of IoMT. This study will also aid academics in gaining a better understanding of IoT applications in the healthcare industry. This research will aid academics in better comprehending IOT's earlier contributions to the healthcare industry [1-4].

The need for personal healthcare applications is likely to skyrocket. The traditional medical paradigm's quality and scale of medical services are insufficient to meet the needs of patients. It is necessary to build a set of family-oriented remote medical surveillance systems based on mobile Internet. The delivery of healthcare services via mobile devices is referred to as m-health. It evaluates, acquires, transmits, and stores health data from a number of sources, including sensors and other biomedical acquisition systems [4-7].

Applications of IoT in Medical Domain

1. Medical Nursing System.
2. Smart Rehabilitation System.
3. IoT-based Kidney abnormality detection system using ultrasound imaging.
4. Application for patient posture recognition using supervised learning.
5. Monitoring patient physiological conditions.

Transistor levels have climbed substantially as biomaterials have advanced, and they are now even more capable of receiving new biological signals from living tissues. The internet of medical things, or IOMD, is a collection of medical devices and apps that connect to healthcare IT systems via online computer networks, Medical supplies.

If you enable Wi-Fi for machine-to-machine communication, the internet of medical things (IOMT) enables virtually any medical device to connect, analyses, and send data across the internet. Not only can digital devices like heart rate monitors be connected to the internet, but so can non-digital items. IOM mainly consists of hospital beds and medications [8-10]. Inlets medical equipment and healthcare products share data in real time and with everyone who has a legitimate need for the information let's see the application in hospital and clinics hospital are the greatest use of IOMT devices can improve healthcare quality while reducing cost, patient waiting is not only the application of IMT fine is hospitals and clinics MRIs, X-ray machines, CT scanners and other equipment can be removed remotely monitored for performances issue long before the hospital staff notice a problem the manufacturer or the service provider can detect issues that need to be corrected [11-13].

Telemedicine extends healthcare services outside hospital walls, and remote patient monitoring via our PM saves time and money for many chronic illness patients. This is especially good for people with diabetes and heart problems. The SDGs place a high value on good health and well-being. At present moment, IoMT is capable of achieving the objective of good health and well-being. The purpose of this study is to provide an overview of IoMT, as well as a list and presentation of important new technologies.

(1) IoMT is getting Cloud-Fog architecture.

(2) Reviewing work on PUF, block chain, AI, and SDN in the context of e-healthcare.

(3) Proposing e-healthcare mapping based on PUF, block chain, AI, and SDN.

(4) Providing an experimental study to the case studies in IoMT that take into account the aforementioned mapping [14-16].

IOMT and smart e-healthcare

21Wireless Technologies and IoMT Enablement Sensors and gadgets in IoT systems are linked through a network of cloud ecosystems with high-speed connectivity between each module. The raw data collected by these devices/sensors is directly sent to cloud storage providers. To gain new insights, the data is cleansed and then analyzed. The Internet of Things, Enabling Technologies, and the Internet of Things Internet of Things, supporting technologies, and devices include smartphones, monitoring devices, sensors, smart wearable's, and other medical equipment. 5G/6G and beyond are now frequently employed in IoMT due to their large bandwidth and ultra-low latency [17-20].

Smart E-healthcare

Smart hospitals use ICT infrastructure and intelligent automated and optimized modules (possibly based on AI/ML) to improve patient care operations and deliver new capabilities. Telemedicine, telehealth, and remote robot surgery are just a few of the applications for smart hospitals. Telemedicine is the delivery of clinical care over the internet, whereas telehealth is the delivery of non-clinical care over the internet. Medical robots do surgery under the supervision of a distant clinician, with inbound data from many sources collected first e.g., via remote or physical gathering) and sent to the EHR (Electronic Health records systems).If data is collected offline on paper as medical notes by professionals, it may be considered as unstructured data [21-25].

Architecture for IoMT

Three layers make up the architecture for IoMTs. There are three layers in total:

a) stuff

b) fog

c) cloud

This is a tweaked version of the architecture from. Healthcare specialists can also communicate directly through the router between the Thing layer and the Fog layer, as well as through the fog layer's local processing serve [26].

Conclusion

The Internet of Medical Things (IoMT) was concluded, and architecture for IoMTs was provided. PUF, Block chain,

Artificial Intelligence, and Software-Defined Networking are also being researched for various elements of IoMTs, including security, privacy, diagnosis, and treatment. Finally, we presented three IoMT case stories that included these tools. The results of the experiments suggest that these technologies can be used in an e-healthcare system for authentication, security, performance, and data gathering time.

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