Chapter 9
Advancements in the Internet of Medical Things: Technology, Integration, and Challenges

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ABSTRACT

Internet of Medical Things is application of Internet of Things to medical and health care fields. Internet of Medical Things has created a revolution in the health care industry by integrating technology in the medical devices, enabling remote monitoring, data collection and real time data analytics. IOMT make use of variety of sensors for collection of patient data along with different communication devices. Upcoming technologies such as artificial intelligence and edge computing are being exploited to enhance IOMT capabilities. The research work focusses on sensors, protocols, and communication technologies in IOMT. Real-time case studies highlighting the practical applications of IoMT and showcasing its ability to monitor vital signs, manage chronic conditions, and improve patient outcomes are also explored. While IoMT has an enormous potential to transform healthcare, addressing integration challenges is crucial for understanding its benefits. The work discusses the challenges related to cybersecurity and interoperability, to ensure integration of IOMT into clinical practice.

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1. INTRODUCTION

A. Background

The Coronavirus pandemic has shown the world the vulnerability of modern healthcare and medical systems. Cardiovascular disease and cancer disease still pose high risk to human life and medical systems are under enormous pressure to protect the health of individuals in society. There is therefore a necessity to build new technologies to detect, prevent and diagnose the health of individuals to expand-pliability of medical systems to such health calamities as cited in study by Huang et al. (2023), Garrido et al. (2008) and Sorenson et al. (2013).

B. Need of Internet of Medical Things (IOMT)

In the past few years, the Internet of Medical Things (IOMT) has developed as an innovative technology that enables monitoring the health of individuals, diagnosis of diseases from symptoms and possible ways of treatment. Thus, the Internet of Medical Things has emerged as a revolution in the way healthcare is delivered. In Internet of Medical Things (IOMT), Internet of Things is applied to the field of medicine. Medical systems in IOMT can be connected to various wearable sensors, and smart devices. These smart devices consist of sensors for observing the health parameters of the body like heart pulse, temperature of the body and many more. Health sensors gather information and transfer the data to the server. The nodes thus help in establishing an information platform for health diagnosis.

In IOMT, health care providers in different roles such as doctors, nurses are connected with various devices and objects. Therefore, connection between people to people, for example patient and doctor, people to things, for example monitoring health statistics of the patient using different sensors and things to things example patient information platform of different patients sent to server can be established. Thus, sensors or devices in the medical field act as *Things* and are connected to provide an information platform. The things in the medical scenario can include traditional medical instruments and tools, medical instruments such as CT and MRI machines, and few hospital facilities like medicine bottles and medical records as stated by Huang et al. (2023). In current years development in the medical field has led to the invention of wearable's and near-field communication devices. These are wearable devices on the body of the patient or an individual for monitoring of health parameters. The wearable sensors also act as *Things* for information gathering.

In the IOMT, not only the communication devices play an important role but the information technology platforms are also very crucial for health monitoring, diagnosis and treatment. All the data gathered using the connected devices is aggre-

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