Chapter 8
Unlocking the Power of Data: Leveraging IoT and Cloud for Better Sleep Health

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ABSTRACT

Healthcare plays a major role in ensuring the health and longevity of individuals and fostering a more productive society. It is a rapidly changing industry with various sectors like medical services, technologies, and products. IoT is emerging as a solution to enhance healthcare through interconnectivity, automation, and real-time data. In healthcare, IoT enables real-time data collection, remote monitoring, and advanced analytics, improving patient care and operational efficiency. However, challenges like data privacy and the need for robust IT infrastructure must be addressed. Cloud computing complements IoT by offering scalable, flexible solutions for health data management. This chapter focuses on IoT and cloud computing in healthcare, particularly in diagnosing sleep apnea. IoT devices connected to the cloud can monitor sleep disorders and aid in accurate diagnosis and treatment. The chapter aims to provide a comprehensive overview of IoT and cloud technologies in healthcare, their benefits, challenges, and potential in revolutionizing sleep medicine.

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1. INTRODUCTION

"Health is wealth". For a person, their health is considered a priceless asset and therefore health is a priceless treasure that needs diligent care and attention. Maintaining and protecting the health of each individual is not only the responsibility of the individual but also the duty of the society and the country. It is only through collective effort that a healthy individual, society, and thereby a nation can be rebuilt. As technology advances, advancements in medical science also need to be brought about to better serve the needs of the people. Each person should make a constant effort to take all possible steps to ensure, maintain, and improve their health care in their daily activities. Every person should strive to embrace and uphold the notion of making decisions that are best for their overall health throughout their lives, especially in this day of contemporary technology and rapid breakthroughs and innovations in healthcare. The healthcare sector extends from a person's daily routines to advanced treatment methods that provide state-of-the-art facilities. The health sector is a complex network of professionals including doctors, nurses, researchers, technicians, and others. The work of the health sector includes timely accurate diagnosis and effective provision of modern treatments, detection of infectious diseases, their prevention and control, implementation of comprehensive preventive measures, and establishment of guidelines based on clinical results. Moreover, through the unwavering commitment and collaboration of these professionals, they make it possible to continuously improve patient outcomes, improve public health, and advance the frontiers of medical science. Not only governments but also individuals invest significant resources to maintain their health but also devote significant portions of their budgets to health care. These investments are critical to building and maintaining healthcare infrastructure, financing public health programs, ensuring access to essential medical services, and supporting ongoing research and development.

The modern healthcare sector must adapt to accommodate new diseases and technological changes. By keeping in mind growing populations, rising healthcare costs, and technological advances in treatment, the research is carried out in different parts of the world to provide lower-cost, higher-quality treatments to people. Traditional methods of diagnosis have several drawbacks. This means, diagnosis often depends on rare tests or hospitalization. Understanding a patient's overall health picture is often overlooked. Most of the time diagnosis is often made after symptoms appear. This can lead to delays in treatment and further complications. Also, frequent hospital visits and treatment procedures are disruptive and time-consuming for patients. This can lead to reduced adherence to treatment plans. Another thing is that the patients living in remote areas and the specialists treating them are not able to provide adequate health care due to a lack of sophisticated diagnostic tools.