IoT Smart Healthcare Security Challenges and Solutions

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Abstract

The primary objective of this chapter is to examine the security concerns of people in their smart homes and focus on the healthcare equipment that comes packaged with future homes that are vulnerable to cyber-attacks, resulting in data breaches. Patients not physically present in a healthcare institution can have their health metrics, such as heart rate, blood pressure, temperature, and more, automatically collected by IoT devices. This eliminates the need for patients to travel to the doctor or gather the data themselves. A crucial component of healthcare procedures is patient care, healthcare IoT applications can potentially improve patient outcomes and the calibre of care given by physicians, nurses, clinicians, pharmaceutical companies, and the government. Wireless healthcare monitoring devices are regarded as a medical revolution widely utilized in hospitals and other healthcare settings. However, on the internet of items paradigm, security and privacy for interconnected items should be considered. A systematic approach to security and privacy safeguards must be employed in creating devices, connecting objects, communicating, handling, and storing data, and destroying such devices and data in the context of healthcare and remote health monitoring. In recent years, smart homes and healthcare have become increasingly popular. It is required to use a more secure method to assure security and privacy. As a result, these techniques can provide security and privacy in Smart health regarding remote patient monitoring and healthcare, communications, data handling, and device failure due to data loss. The smart house and its services, as we currently understand them, create a highly heterogeneous context, posing a substantial problem for future consumers and producers. Healthcare services expose vulnerabilities in interconnected medical devices and pose an unknown threat to human life. This study helps new researchers and related healthcare institutions.

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Introduction

The healthcare industry uses the IoT to enhance patient monitoring, lower costs, and promote innovation in patient care. Healthcare has seen a rise in both medical 4.0 and health 2.0, while industry 4.0 refers to the integration of IoT in the production and consumer sectors. It has made it possible to develop cutting-edge approaches to asset management, medical equipment maintenance, drug administration, autonomous assistive solutions, early warning system development, and treatment plan maintenance. While other functions are still crucial for healthcare, remote patient monitoring is one of the main healthcare IoT (HIoT) areas that saves millions of lives and money(Dimitrov, 2016; Qadri et al., 2020). Wireless Body Sensor Networks (WBSN) are widely accepted as the fundamental Internet of Things technology incorporated into the healthcare industry. As previously mentioned, wearables for fitness tracking are a typical application of the IoT. Nonetheless, IoT has enormous potential for usage in healthcare and could be helpful for early detection, accurate diagnosis, and efficient treatment(Burhan et al., 2018; Food & Administration, 2018). Consumer devices such as continuous glucose monitoring (SGM), blood pressure cuffs, ingestible sensors, linked inhalers, and other devices intended to capture data on patients' vital signs are now the focus of IoT for medical device integration. Another example of this kind of device is the new Apple Watch, which is equipped with detectors for symptoms of Parkinson's illness. Depending on the nature of the disease and the data needs of the caregivers, WBAN connects sensors and actuators to the patient's body. It allows medical professionals to gather data automatically and use decision-support guidelines to enable early therapeutic intervention. For HIoT systems to be secure, to treat patients effectively, and to protect their privacy, security, and privacy protocols are essential. On the other hand, the medical industry is where security lapses and privacy concerns are most documented. Figure 1 Overview of the chapter’s study plan.

Figure 1. Overview of the chapter’s study plan

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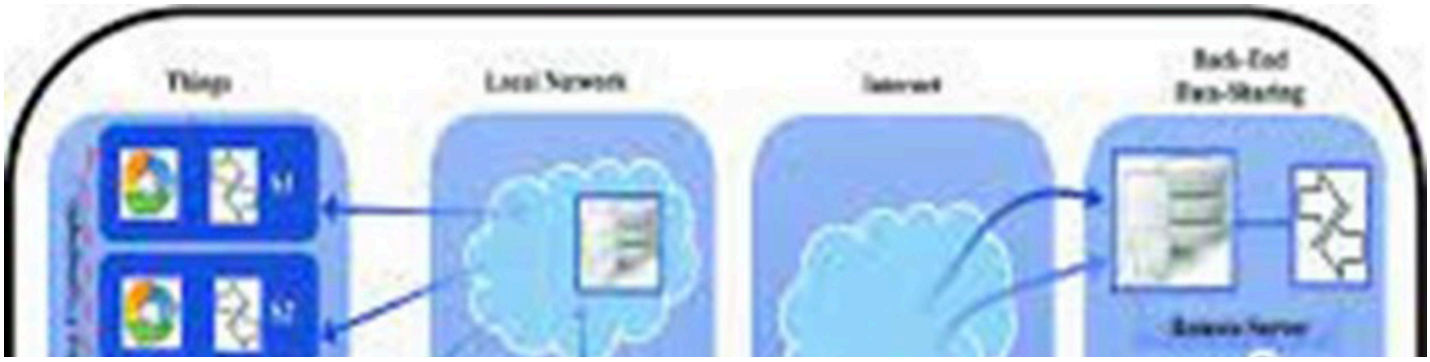
Smart healthcare is receiving a lot of attention from academia, government, industry, and the healthcare community due to the development of intelligent sensory media, objects, and cloud technologies. With a tremendous amount of data and countless services, the Internet of Things (IoT) has recently made the goal of a more innovative world a reality. In this case, cloud computing works well as an enabler because it provides a customizable stack of processing, storage, and software resources at a low-cost S(Rahmani et al., 2018; Wazid et al., 2017). Chronic diseases are a significant problem in the global healthcare industry. According to medical statements, human mortality is increasing due to chronic diseases. Treatment of this disease accounts for more than 70% of a patient's income. Therefore, reducing the risk of death for patients is crucial. Advances in medical research have made it easier to collect health-related data. Patient demographics, medical analysis results, and disease history are all included in healthcare data. Induced disease may vary depending on a particular place's geography and living habitat. Therefore, in addition to disease data, the patient's environmental conditions and living environment should also be recorded in the dataset. Although the healthcare business is not alone in confronting major cybersecurity threats, the repercussions of a failure to prevent digitally illegal attacks are separate failures. Figure 2 Overview IoT in Healthcare System Architecture.

Figure 2. Overview IoT in Healthcare system architecture



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