

Chapter 12

Development of Smart Hospitals Based on the Internet of Things and Cloud Computing

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ABSTRACT

With the expansion of the internet of things (IoT) and its impact on today's life, a significant improvement can be seen in hospital services. The IoT allows patients to take control of their condition. This method can reduce the anxiety of patients to some extent. On the other hand, by collecting the patient's data during the hospital stay, doctors gain clearer views of the patient's body physiology and can provide more specialized and special care plans. With the method provided by the IoT, the interaction between the doctor and the patient increases, and it also helps by monitoring the patient's health remotely and reducing the time spent in the hospital. Storing information from the IoT locally is not only expensive but also brings certain complications for medical centers. For this reason, hospitals are turning to cloud storage of patient information. In this research, in addition to describing the basic features of smart hospitals based on the IoT and cloud computing, a hospital chart based on these technologies is also presented.

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1. INTRODUCTION

A smart hospital means a hospital that redesigns or optimizes clinical processes, management systems, and even infrastructure. This optimization is done using the digital network infrastructure and the Internet of Things, and its goal is to provide services that are not available in the non-intelligent mode. An important component of smart hospitals is the ability to collect data and provide insights from the information. This is what distinguishes the smart hospital from the digital hospital. In other words, to make the hospital smart, it is not enough to remove paper processes and digitize them. Rather, we must be able to collect the necessary data and go one step beyond digitalization (Nahr et al., 2021).

As the integration of Internet of Things technology into everyday life increases, there is a significant improvement in hospital services. The Internet of Things allows patients to take control of the situation and enables doctors and hospital staff to provide the most effective care possible. By increasing transparency and allowing patients to control environmental conditions, patients can be confident that they are receiving the best medical care. On the other hand, by collecting the patient's data during the stay in the hospital, doctors gain clearer views on the physiology of the patient's body and can provide more specialized and special care plans.

Many patients feel fear or anxiety during hospitalization. In smart hospitals, it is possible for the patient to be aware of his body's vital signs. As the nurse records the patient's vital signs, smart devices send the information to the patient's mobile phone. These devices can enable real-time information with VR and AR technologies so that patients can see and understand their body's activities. Also, this information is considered part of the patient's digital report, collecting this information continuously will benefit the patient and the doctor. Between doctor and nurse visits, patients can control a variety of physical conditions in the room, including temperature, light, and sound, as well as access a complete information system and food selection via their mobile phones. Adding these features to hospital rooms helps patients feel more comfortable (Nozari et al., 2021).

Patients do not need to fill out additional documents to pay their fees. A summary of the report of their time spent in the hospital is sent to them via email, and patients can retrieve this information through their mobile phones. After a stressful hospital stay, it is often difficult to remember discharge instructions from your doctor. With new technologies, patients will have access to recommended activities, prescription reminders, physical therapy treatment, and follow-up appointments. If a patient has a question for their doctor, there's no need to wait for it to be addressed or try to contact a health care system. Instead, the patient can simply send an instant message to the caregiver and enable real-time communication for medical purposes.

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