Chapter 2
The Role of the IoT and Digital Twin in the Healthcare Digitalization Process:
IoT and Digital Twin in the Healthcare Digitalization Process

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ABSTRACT

The ability of IoT technology to simplify the adoption of artificial intelligence is precious to consumer product companies. The robustness of consumer companies' IoT initiatives will determine whether they benefit from the rise of IoT. A well-thought-out IoT strategy and execution will improve supply chain efficiency and align products with modern, post-COVID consumer behaviour. It must be noted that the network is not only restricted to computers but also has a web of devices of various sizes and kinds, including medical instruments and industrial systems. Expert analysts put forward the inherent capabilities of IoT devices to not only communicate and exchange information but also create a starting point for new, fresh revenue sources, ignite the business foundation and business models and enhance the techniques of services that propel numerous industries and sectors.

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INTRODUCTION

Hospitals are one of the most challenging systems to manage and represent one of the most complicated systems among all work and organisation competitions. This is because things in daily life that are uncertain or highly variable interact (Evans, 2021). It shows up in different ways inside the hospital, such as clinical variability, flow variability, and professional variability.

Since it is the hospital's responsibility to offer medical care and activities centred on the prevention and treatment of diseases, the alleviation of pain, diagnostic procedures, and other such things, the data entry for patients frequently needs to be done in real-time. As a direct result of this, there is a gap between the actual data and the registered data, and the registered data are the ones that are typically employed when conducting performance analysis (Biesinger, 2019; Qi, 2021). Constantly developing technology has enabled the creation of new sensors that can detect data in real-time (Quirk & Lanni, 2020). The operating room is one of the essential areas in the hospital, and how it is managed affects many other aspects of the hospital's operations, such as the assignment of beds, the creation of surgery waiting lists, the recruitment of staff, and so on.

As a result, one of the most common themes in many scientific disciplines, including engineering, health, economics, and management, is maximising and improving OR efficiency. Repetitive and manual operations are fundamental problems leading to errors and time waste (Ferreira, 2019). In reality, the medical team must record the different times corresponding to the numerous phases the patient must go through for the surgery to be effective because these actions frequently occur in the operating room. The crew often creates these processes at the end of each shift or whenever they have some free time. Of course, this could result in errors and inaccuracies caused by people (Singh, 2021). Industry 4.0 marked the introduction of digital twin technology into our daily lives in the production and engineering sectors. More recently, investigations in the area of health have demonstrated its transformative potential (Erol & Mendi, 2020). A digital replica that enables modelling the condition of a physical asset or system is called a "digital twin." In the healthcare industry, significant advances have been made in creating digital twins of patients and medical equipment and the shows Digital Twince architecture in fig 1.

Transferring the patient's bodily traits and physical changes to the digital world creates the patient's digital twin. One of the most crucial aspects of medicine is providing innovative and conclusive solutions for accurate diagnosis and adherence to patient-appropriate treatment methods. The use of technology is also evident in research in the fields of pharmaceuticals and customised medicine. Qualified studies that will serve as a roadmap for future research are highlighted in this study, which considers the fantastic potential of Digital Twin technology in the health field Dahmen 2018. Transferring the patient's bodily traits and physical changes to the digital world creates the patient's digital twin. One of the most crucial aspects of medicine is providing innovative and conclusive solutions for accurate diagnosis and adherence to patient-appropriate treatment methods Sharma 2021, Autiosalo 2019. The use of technology is also evident in research in the fields of pharmaceuticals and customised medicine. This study highlights qualified studies that can be used as a guide for future research. It also looks at the fantastic potential of Digital Twin technology in health.