# Chapter 2
# Transforming Home Healthcare:
## A Business Ecosystem Approach to Digital Health Solutions

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## ABSTRACT

*The widespread adoption of cloud computing and a variety of affordable client devices such as smartphones, sensors, wearable technology, and the Internet of Things (IoT) has transformed the way we collect data. The constant connectivity of these devices enables remote and continuous data access, making data-driven healthcare not only highly feasible but also executable from a distance. Data gathered from these devices enhances remote diagnostics and can be leveraged to deliver healthcare value in homecare settings, particularly for families and senior citizens. Health consultations can now be conducted remotely, and through coordinated collaboration within the healthcare business ecosystem, integrated healthcare solutions will improve well-being, especially for families and seniors. This chapter explores advancements in digital health, digital solutions for family and senior care, healthcare value creation, the digital healthcare business ecosystem, and recent case studies on digital healthcare innovations.*

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## INTRODUCTION

In general, healthcare is a knowledge-intensive and data-driven service. Health professionals, such as doctors and nurses, have to undergo thorough and standardized education and training. They also need to obtain health-related certifications before they can provide healthcare services. The first step for a health professional in delivering care is to gather patient data, both personal and medical data, for health assessment. This data typically comes from existing medical/health records (historical data), diagnostic instruments, and patient interviews.

For example, in a simple or outpatient consultation setting, a doctor normally performs a basic health diagnosis through an interview, physical or visual examination, and checking important indications such as heartbeats (using a stethoscope) and blood pressure. By integrating the data gathered during a consultation with the medical record of the patient available in the system (such as stored in an Electronic Health Record or EHR), the doctor diagnoses the patient's condition and determines a suitable treatment, which may include professional advice and the prescription of medication. All data gathered during consultation, advice or recommendation, and prescriptions given are recorded in the system.

If the health-related data collected during a consultation is insufficient to come up with a solid decision in giving treatment, the doctor will ask the patient to undergo further checks (more data collection), such as blood and urine tests, X-ray, EEG (electroencephalogram) or even MRI (magnetic resonance imaging) at a different location or organization. If the doctor finds the problem and is unable to perform treatment due to limited knowledge, they will refer the patient to a specialist. Now, a collaborative effort within a healthcare ecosystem needs to be performed to solve the patient's problem.

The above describes conventional healthcare practices, where a patient needs to visit a doctor to have a face-to-face consultation. Observe that to come up with a decision for treatment, a doctor needs the patient's health-related data and a health ecosystem to gather more data and address more difficult problems. If the data can be collected through information and communication technology (ICT), the patient can schedule a virtual consultation via ICT means and, hence, may not need to see the doctor physically. This will save the patient time and money. Through a good healthcare ecosystem, a prescription given to the patient can be forwarded directly to a pharmacy, and a delivery agent can deliver the medicine to the patient's home. All related charges will be sent to the patient’s insurance provider.

ICT-assisted healthcare is normally known as telemedicine, telehealth, or e-health (WHO Global Observatory for eHealth, 2010). The three terminologies are normally used interchangeably, although they may be defined differently. Telemedicine is a healthcare service that is delivered via ICT with much more concern for