


Chapter 4

IoT Protocols for Healthcare for Enhancing Connectivity and Efficiency in Medical Systems


Agha Urfi Mirza

 <https://orcid.org/0009-0009-4897-801X>
*Department of Information technology,
University of Technology and Applied
Sciences, Al Mussanah, Oman*

R. Arulkumar

*Department of Information Technology,
Jeppiaar Institute of Technology,
Chennai, India*


Rafath Samrin

 <https://orcid.org/0009-0002-0336-972X>
*Department of Computer Science, King
Khalid University, Asir-Abha, Saudi
Arabia*

K. Selvakumarasamy

*Saveetha School of Engineering,
Saveetha Institute of Medical and
Technical Sciences, SIMATS, Chennai,
India*

J. Venkatesh

 <https://orcid.org/0000-0002-4259-130X>
*Department of Computer Science and
Engineering, Chennai Institute of
Technology, India*

P. S. V. Srinivasa Rao

*Department of Computer Science
and Engineering, Joginpally B.R.
Engineering College, Hyderabad, India*

ABSTRACT

The adoption of IoT protocols in health systems is a whole new way of increasing its interface and operability. This chapter highlights the potential of various IoT protocols concerning their roles in the medical system's reinvention, basing the

DOI: 10.4018/979-8-3693-5448-3.ch004

analysis on real-time monitoring of patients, data management, and interoperability. These include the main protocols, namely MQTT (Message Queuing Telemetry Transport), CoAP (Constrained Application Protocol), and HTTP (Hypertext Transfer Protocol), which illustrate the advantages of efficiency in data transmission, latency, and proper utilization of network resources. The next section looks at some of the challenges that this implementation poses in healthcare settings: data security, privacy concerns, and scaling. It provides insight, through case studies and current research, into how IoT protocols are enhancing the future of healthcare by adopting a holistic view in improving patient outcomes and streamlining medical processes.

INTRODUCTION

IoT is fundamentally changing many industries today, being one of the most promising fields in healthcare. IoT is based on a network of connected devices through communication with each other and centralized systems via the internet. In health, IoT describes a wide range of technologies and various applications that are targeted at patient care, efficiency in medical processes, and increasing overall efficiency of the system. IoT devices in healthcare are deployed to collect, send, and analyze real-time data over the patient. Generally, IoT sensors include wearables, smart medical equipment, and remote monitoring systems. Wearables like activity trackers and smartwatches track heart rate, blood pressure, and glucose levels for providing input to continuous health monitoring. Because smart medical equipment, including infusion pumps and imaging devices, can be monitored and controlled remotely, it ensures optimal performance and reduced downtime. IoT in health care provides great advantages (Ahad et al., 2020).

Advanced patient monitoring is one of the significant benefits. IoT devices enable continuous and real-time data and thus are helpful to health care providers in maintaining more complete and timely information regarding the health of the patients. This information, therefore, can be used to identify potential problems early and thus intervene earlier with much better outcomes for the patients. A good example is that the wearables in glucose monitoring will be able to alert abnormal levels of blood sugar through self-monitoring by the patient and physicians for timely adjustments in treatment. IoT also enables remote patient management, which is particularly useful in the management of chronic conditions. It facilitates remote monitoring systems, where patients are kept at home while continuing the monitoring process by health professionals. It reduces frequent visits to hospitals, reducing health costs and increasing patient comfort and convenience. Integrating IoT devices with telemedicine platforms even facilitates online consultation and remote diagnosis, thus extending healthcare services for which distance is a constraint (Ding et al., 2020).

28 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/iot-protocols-for-healthcare-for-enhancing-connectivity-and-efficiency-in-medical-systems/377846

Related Content

Robust Duplicate Detection of 2D and 3D Objects

Peter Vajda, Ivan Ivanov, Lutz Goldmann, Jong-Seok Lee and Touradj Ebrahimi (2010). *International Journal of Multimedia Data Engineering and Management* (pp. 19-40).

www.irma-international.org/article/robust-duplicate-detection-objects/45753

On Combining Sequence Alignment and Feature-Quantization for Sub-Image Searching

Tomas Homola, Vlastislav Dohnal and Pavel Zezula (2012). *International Journal of Multimedia Data Engineering and Management* (pp. 20-44).

www.irma-international.org/article/combining-sequence-alignment-feature-quantization/72891

Constructing and Utilizing Video Ontology for Accurate and Fast Retrieval

Kimiaki Shirahama and Kuniaki Uehara (2011). *International Journal of Multimedia Data Engineering and Management* (pp. 59-75).

www.irma-international.org/article/constructing-utilizing-video-ontology-accurate/61312

NLP in Social Media Data Processing

N. S. Saba, Kumari Anjali, Akansha Tanu, Aryan Porwal, Ahan Tejaswi and R. Sindhu Rajendran (2025). *AI Techniques for Multimedia Data Processing* (pp. 181-226).

www.irma-international.org/chapter/nlp-in-social-media-data-processing/382626

Guardians of the Digital Realm: Generative AI's Role in Cybersecurity

Manas Kumar Yogi, Yamuna Mundru and Atti Manga Devi (2024). *Generative AI and Implications for Ethics, Security, and Data Management* (pp. 289-321).

www.irma-international.org/chapter/guardians-of-the-digital-realm/354612