



Chapter 11

Microservices Architecture for Data Analytics in IoT Applications

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ABSTRACT

The internet of things (IoT) is a network of physical objects with sensors, software, and network connectivity built in to enable data collection and sharing. It has led to an exponential increase in data generation, necessitating the development of effective statistical analysis for a range of IoT applications. Predictive analytics is an essential procedure that converts unprocessed data into meaningful insights. To improve decision-making and enhance IoT application performance, it is crucial to create innovative data processing methods and predictive analytical models that can handle the volume and complexity of IoT data. Microservices-based strategies can be implemented to create scalable, reusable, and effective IoT-based analytics solutions.

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1. INTRODUCTION

A network of physical objects with sensors, software, and network connectivity built in to enable data collection and sharing is known as the Internet of Things, or IoT. IoT has emerged as one of the 21st century's most significant technologies in the last few years. Now that everyday objects like vehicles, baby monitors, thermostats, and kitchen appliances can be connected to the internet through embedded devices, communication between people, processes, and things may happen seamlessly.

The widespread adoption of IoT and cloud computing has been accompanied with an exponential increase in data generation, necessitating the development of effective statistical analysis for a range of IoT applications. Because typical methods for processing data cannot handle massive volumes of data, IoT big data analytics has become an important area of study (Acharjya et al., 2016).

Predictive analytics is an essential procedure that converts unprocessed data into meaningful insights. It has been extensively utilized in several fields, such as social networking analysis, medical care, management of energy, and smart homes (Saggi et al., 2018). For improved decision-making and enhanced IoT application performance, it is crucial to create innovative data processing methods and predictive analytical models which can handle the volume and complexity of IoT data.

Numerous issues have arisen as a result of the increasing amount of data generated by Internet of Things devices and the demand for effective, scalable, and efficient analytics solutions (Tariq et al., 2019). Overcoming the shortcomings of monolithic service delivery approaches is a significant problem, in addition to other ones like the growing volume of raw data and the variety of data types and forms that need to be analyzed. The limitations of monolithic architectures can be solved and the creation of scalable, reusable, and effective IoT-based analytics solutions can be possible by implementing a microservices-based strategy. It will enhance the effectiveness of the IoT-based applications. In this chapter, we are about to study various aspects, strategy and effectiveness of the Microservice architecture for Data Analysis in IoT applications.

2. BACKGROUND AND RELATED STUDY

There is limited study available for architecture with IoT and microservices –based architecture with IoT. Hence a comprehensive study on this topic is not yet done. There are a few noted architectural difficulties with the internet of things (Maney et al., 2017; Shahid et al., 2017; Jacob et al., 2018; Oquendo et al., 2017). We have figured out some quality attributes of IoT (Kim, 2016). Other issues with the internet of things have been noted, such as scalability and interoperability.

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