Chapter 8
Internet of Things (IoT) Impact on Inventory Management:
A Review

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ABSTRACT

The impact of the internet of things (IoT) on inventory management is explored in this chapter. The chapter discusses comprehensively IoT system components, communication protocols, their architectures, and applications in various sectors. This chapter also investigates how IoT enabled inventory can provide real-time inventory management through timely monitoring, tracking, and optimization of inventories by employing RFID tags and readers. The RFID tags include encoded data in the form of unique IDs, which facilitates effective tracking and monitoring of goods and services pertaining to an organization. RFID readers can detect tags and transmit data encoded in it to the cloud for processing, thereby resulting in well informed data-driven decisions with improved operational efficiency. Furthermore, the chapter explores inventory management processes in the context of IoT-enabled inventories. The chapter also presents a comprehensive comparison of IoT enabled inventories with the traditional inventory management systems.

INTRODUCTION

Inventory management is critical in supply chain management because it addresses both production and price problems. Its primary purpose is to lower inventory costs while improving customer service levels through the use of efficient restocking methods. Because it comprises raw materials, work-in-process components, and finished commodities, inventory is a vital component of the supply chain. Figure 1.0 demonstrates the recent rapid development in the deployment and use of IoT devices across a variety of industries, including logistics, healthcare, retail, and manufacturing, to name a few. The Internet of Things (IoT) is a network of interconnected devices that comprise sensors, software, and communication capabilities for data collection and sharing. This technology has revolutionized inventory management by allowing for real-time visibility, automation, and better decision-making. This book chapter examines the impact of IoT on inventory management. This chapter is divided into eight sections. The first section provides background information on IoT in inventory management, as well as the objectives, scope, methodology, and review structure of the study. The second section introduces inventory management, including its definition, purpose, typical inventory management techniques, and related difficulties. Section 3 discusses the notion of IoT in inventory management, covering IoT understanding, definition, core principles, major components of IoT systems, communication protocols, standards, and architectures. Section 4 investigates several Internet of Things inventory management solutions such as real-time tracking, automated inventory replenishment, procurement, predictive maintenance, quality control, supply chain visibility, optimization, demand forecasting, and customer analytics. Section 5 investigates IoT-enabled Inventory Management Systems, covering RFID, sensor networks, data collection, cloud computing, big data analytics, and the integration of IoT with existing inventory management systems. Section 6 investigates the benefits and challenges of IoT in inventory management, such as improved inventory tracking accuracy and efficiency, reduced stockouts and overstocks, improved supply chain visibility and collaboration, cost savings, operational optimization, and security and privacy concerns. Section 7 contains case studies and examples of real-world uses of IoT in inventory management across various sectors, as well as success stories and lessons gained from using IoT in inventory management. Finally, Section 8 examines the future trends and implications of IoT in inventory management with an emphasis on emerging technologies, advancements, potential impacts on inventory management practices, industry trends, policy, and regulatory concerns for IoT-enabled inventory systems.

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