

Universiti Teknologi MARA

**SmartStocker: Inventory Management
System using Qr Code**

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ABSTRACT

In today's fast-paced retail environment, proper inventory management is critical to operational efficiency, customer satisfaction, and corporate success. However, traditional stock-checking methods often involve time-consuming manual operations that delay responses and reduce productivity. This proposed project solves these inefficiencies using the SmartStocker Inventory Management System, a mobile solution that incorporates QR code technology for real-time stock changes and easy product lookups. The system's goal is to eliminate stock-checking delays, increase accuracy, and improve overall consumer and employee experiences. Designed to improve stock-checking operations, the system allows staff members to access real-time stock data, scan product QR codes for rapid search, and decrease delays caused by manual backroom verifications. Developed using the Scrum methodology, the system emphasizes iterative development and continuous stakeholder feedback, ensuring it meets both technical and functional requirements. The main components include Android Studio for application development, Firebase for real-time data synchronization, and Java as the major programming language. The system also includes innovative features such as a responsive mobile interface and real-time database updates, which give staff easy access to stock information. The proposed system, SmartStocker is particularly suited for single-store environments, focusing on localized inventory management. Expected outcomes include improved operational efficiency, reduced manual errors, enhanced customer satisfaction, and better decision-making for inventory managers. However, challenges such as maintaining QR code tags, dependency on mobile device compatibility, and the need for consistent database updates are acknowledged. By addressing these limitations and capitalizing on its strengths, SmartStocker offers a scalable, cost-effective solution to optimize inventory management. The proposed project considers how retail companies might use technology to get beyond operational barriers, ensuring prompt service and developing lasting customer loyalty. A major step toward attaining sustainable growth and competitiveness in the retail sector has been taken with its emphasis on efficiency and integration of modern technologies. In later phases of the project, the SmartStocker system was tested in terms of usability and requirement traceability to determine its capability to meet the suggested goals. All identified requirements were successfully addressed by the system, providing the smooth operation of QR code-based stock search, real-time updates and a user-friendly mobile interface. The usability testing on System Usability Scale (SUS) proved that the system was not only efficient but also accessible to store employees with high levels satisfaction. The findings indicated that there was a significant increase in the speed of checking the stocks and also a decrease in the waiting time of customers. Chapter 5 concludes that SmartStocker system not only achieved its goals, but it can also improve the in-store operations and customer experience significantly. Additional improvements that might be made in the future include multi-branch inventory integration, the addition of analytics dashboards, and offline capabilities, which will guarantee scalability and applications across wider retail platforms.

TABLE OF CONTENTS

CONTENTS:	PAGE
SUPERVISOR APPROVAL.....	ii
STUDENT DECLARATION	iii
ACKNOWLEDGMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF FIGURES	ix
LIST OF TABLES.....	xi
LIST OF ABBREVIATIONS	xii
CHAPTER 1	1
INTRODUCTION.....	1
1.1 Background	2
1.2 Problem Statement	3
1.3 Research Question	3
1.4 Research Objectives	4
1.5 Scope	4
1.6 Project Significance	5
1.7 Expected Outcome	5
1.8 Project Limitation	6
1.9 Chapter Summary	7
CHAPTER 2	8
LITERATURE REVIEW	8
2.1 Challenges in Current Inventory Management Systems	8
2.2 Comparison of existing system.	10
2.2.1 Cin7	10
2.2.2 InFlow	11
2.2.3 Xerafy	12

CHAPTER 1

INTRODUCTION

Effective inventory management is essential to preserving customer satisfaction, operational effectiveness, and overall business success in the fast-paced retail world of today. Inventory management is a vital component of running a store since it has a direct impact on customer satisfaction, sales success, and supply chain efficiency (Saillaja et al., 2023). Proper inventory policies ensure that customers can find the things they want when they need them, boosting sales and strengthening the supply chain. With the rise of consumer expectations and the increasing demand for seamless shopping experiences, retailers are under pressure to ensure accurate and real-time stock availability. Traditional stock-checking systems, which frequently involve manual processes and backroom verifications, are failing to meet today's challenges. A growing range of technologies are available to retail stores that can improve both operations and the customer experience (Alexander and Kent, 2021). These technologies, which include mobile applications and automated systems, contribute to improved inventory management, fewer errors, and better overall service. This chapter introduces the background, problem statement, research questions, objectives, scope, and significance of developing a mobile inventory management system aimed at improving operational efficiency, reducing delays, and enhancing customer experience in retail stores. QR Code technology might be considered an essential upgrade to the inventory management system because it can contain a lot more information and is simple to produce and print (Min et al., 2020). In addition to their ease of use and functionality, QR codes are a great way to manage inventory, give customers fast access to product information, and cut away with the need for complicated data entry systems.