

RFID SMART TROLLEY IMPLEMENTATION
SATISFACTION AMONG HYPERMARKETS'
CUSTOMERS IN MELAKA



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I hereby declared that I had read this thesis and this thesis are adequate in terms of scope and quality which fulfil the requirement for the award of Bachelor of Technology Management with Honors (Technology Innovation).



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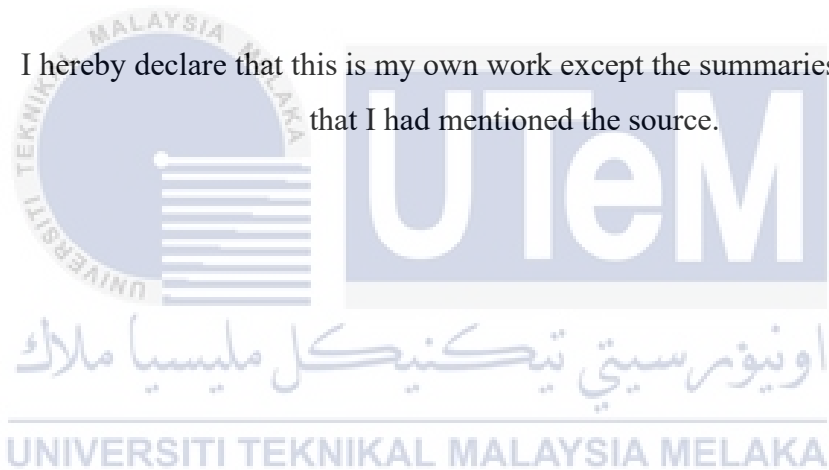


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JANUARY 2023

DECLARATION OF ORIGINAL WORKS

I hereby declare that this is my own work except the summaries and citations that I had mentioned the source.



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DEDICATION

I thus dedicate this to Almighty God, esteemed Professors, parents, sisters, friends, and seniors who acted as a source of direction, support, and expertise for the researcher during the process of finishing this thesis.



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With all being said, I hope that my take on this particular assignment had fulfill the guidelines and criteria that Ts Dr. Yusri bin Ahmad have told me to do. May I pass this subject with flying colors and may Allah make it easier for us, Amin.

ABSTRACT

The RFID-enabled smart trolley offers a new method for hypermarket customers to pay their bills quickly and easily. Customers are dissatisfied when they cannot find the products on their shopping list in supermarkets and if no help is offered. Each product will label with an RFID tag, and the RFID reader will scan the buying goods and display it on the tablet. It also helps to reduce congestion at the checkout counters and time and effort wasted throughout the accounting process. This study focuses on implementing a smart trolley with RFID to improve customer satisfaction as they wait in billing lines. The trolley is intended to enhance market services by making them more innovative, healthful, and user-friendly. This study gives customers a better grasp of the advantages of utilizing a smart trolley with RFID when shopping. The findings may aid retail shop managers in developing and implementing more effective relationship marketing strategies. A quantitative survey with 150 respondents was conducted to explore if RFID smart trolley is implement in hypermarkets through perceived ease of use (PEOU), perceived enjoyment (PE), quality (Q), responsiveness (R), and product experience (PRE) towards customer satisfaction (CS).

Keywords: RFID, smart trolley

ABSTRAK

Troli pintar yang didayakan RFID menawarkan kaedah baharu untuk pelanggan pasar raya besar membayar bil mereka dengan cepat dan mudah. Pelanggan tidak berpuas hati apabila mereka tidak dapat mencari produk dalam senarai beli-belah mereka di pasar raya dan jika tiada bantuan ditawarkan. Setiap produk akan dilabelkan dengan teg RFID dan pembaca RFID akan mengimbas barangan yang dibeli dan memaparkannya pada tablet. Ia juga membantu mengurangkan kesesakan di kaunter pembayaran dan masa serta usaha terbuang sepanjang proses perakaunan. Kajian ini memberi tumpuan kepada pelaksanaan troli pintar dengan RFID untuk meningkatkan kepuasan pelanggan semasa mereka menunggu di talian pengebilan. Troli ini bertujuan untuk meningkatkan perkhidmatan pasaran dengan menjadikannya lebih inovatif, sihat dan mesra pengguna. Kajian ini memberikan pelanggan pemahaman yang lebih baik tentang kelebihan menggunakan troli pintar dengan RFID semasa membeli-belah. Penemuan ini mungkin membantu pengurus kedai runcit dalam membangun dan melaksanakan strategi pemasaran perhubungan yang lebih berkesan. Tinjauan kuantitatif dengan 150 responden telah dijalankan untuk meneroka sama ada troli pintar RFID dilaksanakan di pasar raya besar melalui persepsi kemudahan penggunaan (PEOU), persepsi keseronokan (PE), kualiti (Q), responsif (R), dan pengalaman produk (PRE) terhadap kepuasan pelanggan (CS).

Kata kunci: RFID, troli pintar

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CHAPTER 1

INTRODUCTION



1.0 Introduction

Several parts have been split in this research chapter to introduce the purpose of this investigation. The research's background and description of the issue will indicate the significance of the study, which will benefit the people and components concerned. In addition, the issue statement is now the starting point for explaining why the research is being conducted. Followed by the aims and research question to be addressed in the subsequent chapter.

1.1 Research Background

A trolley is a wheeled device for transporting heavy items such as groceries or baggage. Customers within the store utilize the shopping cart to take things to the cashier or their vehicle (Alexander A S Gunawan et al., 2019). People nowadays seek to make their job more straightforward and quicker. In line with the progression

of time, technological development has also advanced. Additionally, these technical developments have led to people's buying habits also evolving. Due to technological progress, Amazon has created and used intelligent shopping carts in Los Angeles. The advent of the shopping cart enables shoppers to enter and exit without waiting in line. It demonstrates that Malaysia can implement or use such modern technologies in our hypermarkets. This innovative trolley's objective is to promote hypermarket purchasing by attracting consumers' interest. Therefore, the intelligent trolley assists consumers in handling and locating items (Alexander A S Gunawan et al., 2019) by displaying on the tablet the location of the product on the shelf. The smart trolley enhances hypermarket operations and gives consumers efficiency and convenience. It may also assist in improving and modifying the shopping experience of customers.

In the past research project, researchers focused on solving problems encountered by clients in a market, such as waiting in line for payment (Susanna M Santhosh et al., 2020). If smart trolleys are introduced around Malaysia, customers would be more impressed with the presence of new technologies that make shopping more straightforward. The most effective methods to assist customers are shortening shopping time, lowering item costs, and automating invoicing (Susanna M Santhosh et al., 2020). Even if a single customer purchases many goods at once, the cashier will have to scan each item, creating a lengthy line. The long queue undoubtedly consumes more of the customer's time, reducing their pleasure due to the poor services they obtain. All innovation looks forward to advancements and fixes to these problems so that hypermarkets can verify the customer's pleasure. The smart trolley system will improve the retail experience by enhancing interaction and making customers more pleasant (B. N. Arathi and M. Shona, 2017).

Barcode technology systems have been implemented in supermarkets in Malaysia. Customers must, however, use their phones to scan all items and things purchased. Instead of a barcode method, the smart trolley device includes a touchscreen tablet and RFID (Radio-frequency identification). Every object or commodity has an RFID tag and is scanned using an RFID reader attached to a trolley. It is intended to make things easier and more convenient (Alat Laxmi et al.,

2018) by allowing consumers to make payments autonomously without the assistance of a cashier. Customers may complete their transactions without the requirement for a standard staffed checkout at self-checkouts (SCOs), also known as self-service checkout. It has the potential to minimize labor expenses and quicken the checkout process for consumers (Ng Xin Jie and Intan Farhana, 2021). When compared to non-users, consumers prefer to utilize self-checkout counters because they anticipate a quicker checkout time. This study aims to discover the RFID smart trolley implementation satisfaction among hypermarkets' customers in Melaka. It may be an alternate route for customers looking to shorten delivery service time and avoid queues. With the rise of technology, there may be a cashier-less checkout in every shop by next year if using a smart trolley becomes common across Malaysia.



1.2 Problem Statement

This study is focused on identifying the RFID smart trolley implementation satisfaction among hypermarkets' customers in Melaka. There will always be a cause for conducting the research. This issue statement aided the researcher in visualizing the project's scope. RFID readers may be more costly and sophisticated than barcode scanners; businesses must pay for all RFID pieces, including RFID tags, software, hardware, and RFID readers. For many firms, this is one of the barriers to RFID technology. It makes it difficult for retailers to decide whether or not to implement an RFID system. Even though RFID offers to improve customer service, privacy remains a significant issue for retail business professionals. It is due to the ease with which RFID tags may be cloned, notably if the chip lacks a security mechanism (Bueno et al., 2016). RFID deployment is unavoidably expensive. However, implementing RFID technology in business will result in long-term profitability. They can save costs by firing off halves of the employees, such as cashiers and those who calculate stock inventories, because RFID systems will carry out the task automatically.

This initiative also tackles the issue of personal privacy risks. Products with RFID tags may be scanned even after they leave the store. RFID tags may be detected from a distance, allowing anybody with an RFID reader to view the items of a customer's handbag or pockets as they pass by (Arjun Agarwal and Mala Mitra). The solution to this problem is to stop consumers from being tracked; supermarkets should insert the Electronic Product Code (EPC) Kill command into the detectors installed at the exit doors. Its purpose is to deactivate tags when they exit stores. As a result, the labels can no longer be read, and hackers can no longer track the customers.

Touch 'n Go has implemented RFID toll collection system in 2022. RFID is being implemented as a method of electronic payment for tolls throughout the

country to give users a faster and more delightful journey experience. However, they have received several complaints regarding unreadable tags or readers failing to identify RFID tags (Berita Harian, 2022). Because RFID systems are currently ineffective and have detecting flaws, this has increased traffic at toll plazas. Before releasing the RFID system to the public, Touch 'n Go should ensure that it functions properly and is in excellent condition. As a result, the toll lanes should have many scanners to cover the detecting area in order to prevent RFID tags not being read properly.

Even though the RFID reader can scan many things at once, RFID systems are readily disturbed. They are easily jammable when employing energy at the correct frequency (Simson L. Garfinkel et al., 2005). Customers at shops would be inconvenienced since the checkout line would get longer. Companies must test alternative technology and tag systems to find the best match. These issues can be solved by significantly improving RFID technologies in smart trolleys. Customers will have a sense of contentment and ease when buying.

1.3 Research Questions

1. What are the factors that contribute to RFID smart trolley implementation satisfaction among hypermarkets' customers in Melaka?
2. Is there a significant relationship between the implementation RFID smart trolley and customer satisfaction in Melaka?
3. What are the most dominant factor in RFID smart trolley implementation satisfaction among hypermarkets' customers in Melaka?

1.4 Research Objectives

This project has the following objectives:

1. To identify the factors that contribute to RFID smart trolley implementation satisfaction among hypermarkets' customers in Melaka
2. To examine the relationship between the implementation RFID smart trolley and customer satisfaction in Melaka.
3. To determine the most dominant factor in RFID smart trolley implementation satisfaction among hypermarkets' customers in Melaka.