

## Research on the Application Oriented E-Commerce and Smart Retail

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### ABSTRACT

Over the past four decades of reform and opening-up, our society has undergone profound qualitative changes across all sectors. Notably, the retail industry has transitioned from traditional brick-and-mortar stores to thriving online shopping platforms, reshaping our way of life and impacting market economies. This constant evolution in the retail landscape, driven by advancements like AI, big data, cloud computing, IoT, and 5G, has ushered in the era of Online-to-Offline (O2O) commerce.

The emergence of smart new retail presents both opportunities and challenges, demanding a reevaluation of how we educate future professionals in e-commerce. Traditional teaching methods in e-commerce programs no longer suffice for today's application-oriented undergraduates. To equip students with the skills necessary for success in this dynamic field, we must prioritize practical training and innovation.

To cultivate application-oriented talent in e-commerce amidst the backdrop of smart new retail, we need to overhaul our approach to education. This entails breaking away from conventional talent cultivation systems, emphasizing industry-education integration, fostering innovation and entrepreneurial mindset, and enhancing technical proficiency in emerging technologies.

From a knowledge perspective, it's essential to grasp fundamental theories and methods of traditional e-commerce operations while also fostering interdisciplinary integration. On the practical side, students must develop not only the technical skills necessary for e-commerce operations but also soft skills in data analysis, marketing, logistics, customer relationship management, e-payment systems, and new media marketing. Embracing these changes will ensure that future e-commerce professionals are well-equipped to thrive in the ever-evolving landscape of smart retail.

**Keywords:** Evaluation in Retail, Understanding Smart Retail Technologies, Smart Retail, E-Commerce Simplification of retail and E-Commerce, Application oriented research

## INTRODUCTION

The advent of new technologies in the modern era has not only propelled the rapid advancement of smart retail but has also revolutionized the way customers access high-quality products and services. However, it has simultaneously posed disruptive challenges to the retail industry. Enhancing customer satisfaction and increasing their lifetime value have become integral aspects of cultivating application-oriented talents in the field of E-commerce.

Smart new retail places significant emphasis on customer-centric values, leveraging technologies such as the internet, Internet of Things (IoT), big data, and AI to provide diverse and personalized products and services. The O2O operational model and the integration of "Wisdom plus Internet plus Retail" define the professional training objectives for application-oriented E-commerce talents.

Research into the training modes for applied talents in E-commerce spans from modelling to implementing specific measures, aiming to address shortcomings and adapt to the evolving landscape of smart new retail. This paper aims to explore the dynamic relationship between smart retail and e-commerce, elucidating the synergies, challenges, and transformative opportunities they present. Through an in-depth analysis of literature, case studies, and industry insights, it seeks to provide a comprehensive understanding of the evolving retail landscape in the digital age. Key themes include tracing the evolution of retail, understanding smart retail technologies, analysing the impact on e-commerce, addressing challenges and opportunities, and providing future directions and recommendations. By synthesizing insights from academia, industry, and technology, this paper endeavours to offer a strategic roadmap for businesses aiming to navigate the convergence of smart retail and e-commerce successfully in an era defined by rapid technological innovation and evolving consumer demands.

### **Key themes to be addressed include:**

1. **The Evolution of Retail:** Tracing the historical trajectory of retail from traditional brick-and-mortar stores to the digital realm of e-commerce, and subsequently to the era of smart retail. We will examine the factors driving this evolution and the implications for businesses and consumers alike.

2. **Understanding Smart Retail Technologies:** Delving into the core technologies underpinning smart retail, including artificial intelligence, big data analytics, Internet of Things (IoT), cloud computing, and augmented reality. We will explore how these technologies are reshaping the retail experience and enabling innovative business models.

3. **E-commerce in the Age of Smart Retail:** Analyzing the impact of smart retail technologies on e-commerce platforms and operations. We will assess how e-commerce businesses are leveraging smart

retail tools to enhance customer engagement, optimize supply chain management, and drive sales.

**4.Challenges and Opportunities:** Identifying the key challenges and opportunities that arise from the convergence of smart retail and e-commerce. From data privacy concerns to the rise of omnichannel retailing, we will explore the implications for businesses and strategies for navigating this complex landscape.

**5.Future Directions and Recommendations:** Anticipating future trends and developments in smart retail and e-commerce, and offering practical recommendations for businesses looking to capitalize on emerging opportunities. We will discuss the importance of agility, innovation, and customer-centricity in driving sustainable growth in the digital retail landscape.

## **INDENTATIONS AND EQUATIONS**

### **Essential Usability.**

1. An Improved omnichannel customer experience.

As consumer needs have changed, users have come to expect more integration between their digital and physical shopping experiences. Improved usability across platforms can help your business meet customer's omnichannel expectations. Being available when and where your customers need you makes their shopping journey more convenient. A clear and functional website further simplifies the process.

2. Reduce browsing time.

Site browsing should be as easy and enjoyable for your site visitor as possible. An optimized ecommerce UX is one that reduces loading times and allows consumers to find the products they need most quickly. According to a recent survey consumer are most likely to make a purchase between three and four minutes after loading your site. Once this increases to seven minutes, the likelihood of completing the checkout process dramatically decreases. Thus, visitor durations that are increased because of usability issues have a significant effect on potential revenue.

3. Establish credibility.

An online store that provides a consistent experience with every visit and transaction promotes consumer trust and enhances brand credibility. By contrast, if your site is slow or difficult to navigate and has a messy user interface (UI) this will damage its reputation with consumers. This means fewer repeat purchases and a higher likelihood of cart abandonment.

4. Enhanced brand engagement.

Once a smooth shopping experience is achieved, consumers are more likely to return for repeat purchases. Here, in addition to easy navigation, a clean and memorable site design will make sure your brand is memorable and set it apart from the competition. Consistency in the visitor experience you provide will establish brand awareness. In addition, appealing visual and textual elements will entice

users to explore your site and engage with your content.

## **Development Methodology.**

The Smart Retail and E-Commerce Application was developed using an iterative and agile approach, enabling continuous feedback and refinement throughout the process to ensure updates are beneficial. Crafting a smart retail and e-commerce system demands a meticulously structured methodology to guarantee efficiency, scalability, and alignment with business objectives.

## **Requirements Gathering.**

Gathering requirements for a smart retail and e-commerce system involves a comprehensive approach to understand business needs, user preferences, and technical considerations. Here's how it can be approached:

### 1. Stakeholder Interviews;

Conduct interviews with key stakeholders including business owners, managers, marketing personnel, and IT staff. Understand their objectives, pain points, and expectations from the smart retail and e-commerce system.

### 2. Market Research;

Analyze the current market trends in retail and E-Commerce. Identify competitors and analyze their offerings, strengths, and weaknesses. Look for opportunities to differentiate and innovate.

### 3. User Research;

Define the target audience segments (e.g., demographics, preferences, behavior). Conduct surveys, focus groups, or usability tests to gather insights into user needs and expectations. Understand how users interact with existing retail and e-commerce platforms.

### 4. Functional Requirements:

Define the core features and functionalities required for the smart retail and e-commerce system. Include features such as product browsing, search, filtering, cart management, checkout, payment processing, order tracking, etc.

Consider additional features like personalized recommendations, social sharing, loyalty programs, etc., based on stakeholder and user input.

### 5. Prototyping and Feedback:

Develop prototypes or mockups to visualize the user interface and workflows. Gather feedback from stakeholders and users to validate the proposed requirements and identify any gaps or changes needed.

### **Testing and Validation.**

Testing and validation are critical components of the development process for e-commerce and smart retail systems. These processes ensure that the systems meet user requirements, function reliably, and adhere to industry standards. In a research paper, detailing the testing and validation procedures provides transparency and credibility to the development methodology.

### **Research and Development in Smart Retail and E-Commerce.**

A. Developing smart retail platforms is geared towards adapting to the evolution of new retail and the modernization of traditional supermarkets, aiming to fulfill customers' online shopping requirements. Once the digital procurement system is established, procurement managers can select suppliers, choose products for purchase, and place orders online through the system. Simultaneously, the purchased items are automatically integrated into the backend commodity management system and added to the shelves. This eliminates the need for intermediary buyers to re-import documents, reducing their workload and enhancing efficiency. The successful implementation of the digital procurement system can be replicated in other similar stores to enhance enterprise revenue.

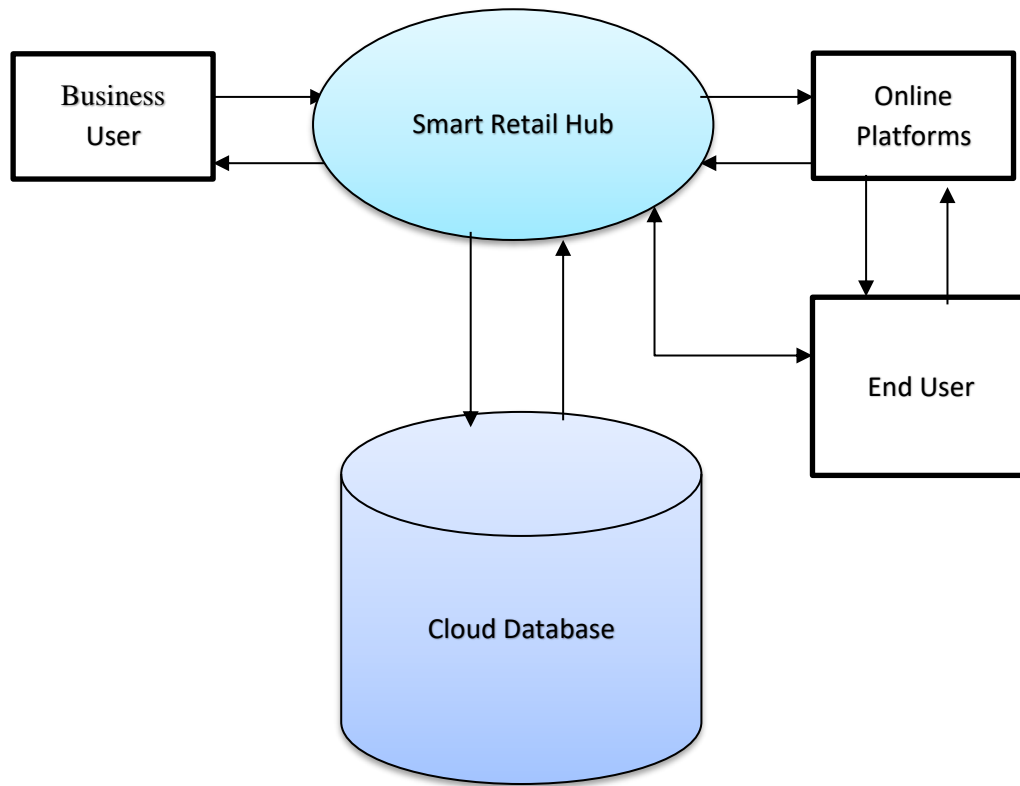
B. Innovating hypermarket (supermarket) retail involves highly integrated and advanced O2O channels, offering customers pre-sales, sales, and after-sales services. Utilizing technologies such as big data and cloud computing enhances customer satisfaction and loyalty.

C. Revolutionizing the mobile communication industry's management is pivotal for its success. This requires strategic planning, bolstering cultural development, precise market targeting, and implementing innovative marketing strategies tailored to the industry's characteristics, including personalized and diversified services.

D. Establishing smart new retail and innovating supply chain platforms should be centered on precise customer demand to enhance efficiency and quality. Resource integration is an innovative approach to achieve a highly coordinated organizational structure across product design, procurement, production, sales, and service processes.

E. Innovating in smart living homes involves strategic brand management spanning from suppliers to manufacturers, sales integration, logistics, and after-sales services, forming a comprehensive industrial chain for the smart new retail model.

**SYSTEM ARCHITECTURE.**



**DATABASE DESIGN.**

• **General Information –**

Field Name	Types	Input type	Data Type	Size
Date	-	Auto Generated	Integer	Auto
Voucher Details	-	Auto Generated	Integer / char/float	4
Sales Invoice (No.)	-	Auto Generated	Integer	6
Sales Types	Cash/Credit/UPI/Bank Transfer		String	20
Party Name	-	Manual Input	String	Depends on name

Contact Information	Mobile no , Email, etc. with auto country code detection	Manual Input	integer / String	Depends on info
Billing Address & Shipping Address	-	Manual Input	integer / char	Depends on info
GST No.	-	Manual Input	integer / char	15
Ledger Type	Normal Sale, IGST Sale	Manual Input	String	Depends on info

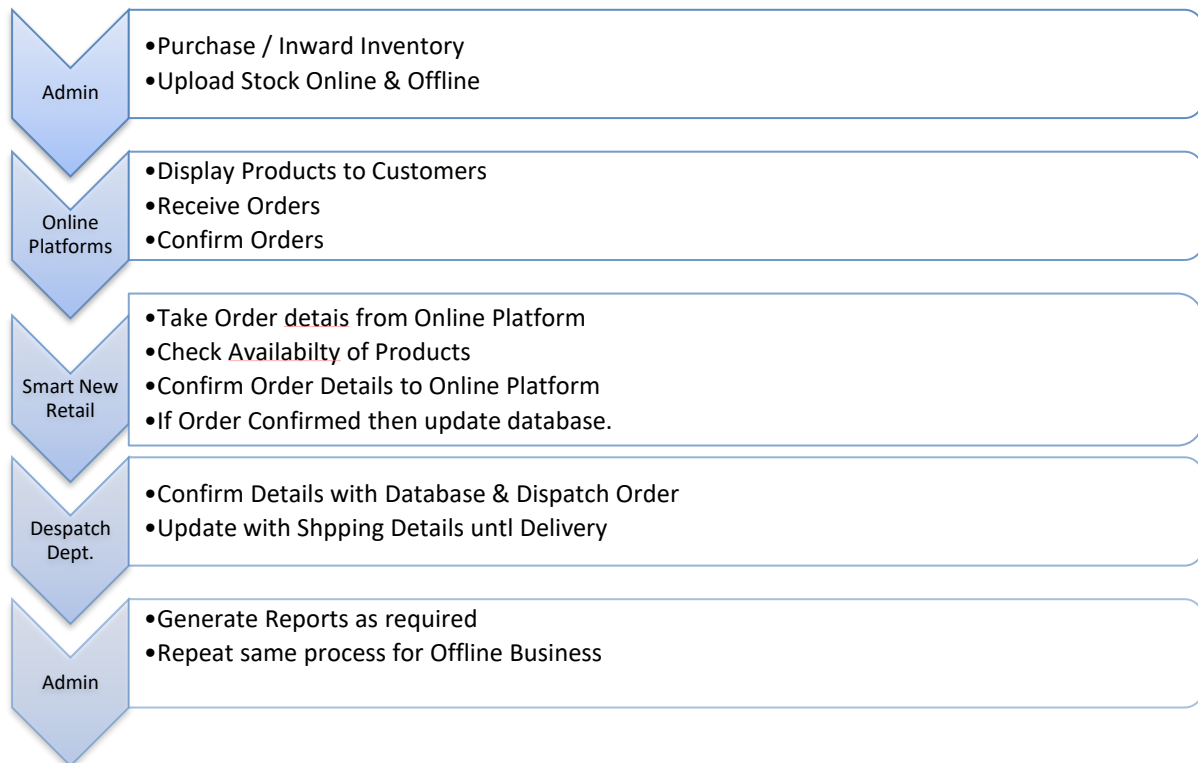
• **Item Information –**

Field Name	Type	Input Type	Data Type	Size
Item Barcode	Scanning			
Item Name	-	Auto Populated from Barcode	String	Depends on info
Item Description		Optional	String	Depends on info
Item Quantity		Manual	integer	Depends on info
Item Unit		Manual	String	Depends on info
Item MRP		Auto Generated from Barcode	integer	Depends on info
Item Sale Price		Auto Generated from Barcode & Quantity	integer / float	Depends on info
Item Discount	On MRP / Sale price	Auto Generated from Barcode & Quantity	integer / float	2

• **Billing Amount Information –**

Field Name	Type	Input Type	Data Type	Size
Sub-Total Amount	-	Auto Generated	Float/Integer	Depends on info
Tax Type	-	Auto Generated from GST No	Integer/Float	4
Tax Value	-	Manual Input	Float/Integer	Depends on info
Freight	Delivery Charges / Check Box	Manual Input	Float/Integer	Depends on info
Final Total	Billing Amount	Auto Generated	Integer	Depends on info

## SYSTEM DESIGN





## CONCLUSION

E-commerce continues to stand out as a resilient business model, capable of weathering market fluctuations and economic downturns. Despite stock market volatility and commodity price fluctuations, e-commerce has demonstrated its ability to thrive and maintain robust transaction volumes. In Malaysia, e-commerce presents significant opportunities for businesses, offering a platform to introduce novel transactional techniques and styles. Leveraging the expansive reach of the internet, e-commerce holds tremendous potential to benefit both individuals and the nation as a whole.

Undoubtedly, e-commerce has evolved into a vital aspect of contemporary society. Forward-thinking companies recognize the importance of e-commerce and allocate adequate resources to its development. It is crucial to understand that e-commerce is not merely an IT concern but encompasses the entirety of business operations. Organizations that leverage e-commerce to restructure their business processes stand to gain substantial advantages. Furthermore, e-commerce serves as an enabling technology, granting consumers access to businesses and enterprises worldwide.

In conclusion, the development of smart retail and e-commerce systems marks a transformative journey in the realm of retail and commerce. These systems, driven by innovative technologies and customer-centric approaches, aim to meet the ever-changing needs and preferences of modern consumers while enhancing operational efficiency and competitiveness for businesses.

The integration of smart retail platforms, O2O channels, and advanced supply chain management streamlines operations and elevates customer experiences through tailored services, seamless transactions, and data-driven insights. Additionally, the emergence of smart living environments expands the scope of these systems, creating interconnected ecosystems that cater to various facets of consumers' lives.

Moving forward, continuous innovation, adaptation, and collaboration will be pivotal in unlocking the full potential of smart retail and e-commerce. Embracing emerging technologies, harnessing data analytics, and nurturing customer engagement will serve as crucial strategies for maintaining competitiveness in an ever-evolving digital landscape.

Ultimately, the journey towards smart retail and e-commerce transcends the mere adoption of new technologies; it entails a complete reimagining of the retail experience, from procurement to post-sales support. By capitalizing on innovation and technology, we can forge a more interconnected, efficient, and sustainable future for the retail industry.

## REFERENCES.

### Books.

1. "The Everything Store: Jeff Bezos and the Age of Amazon" by Brad Stone

This book offers an in-depth look at the rise of Amazon and its impact on e-commerce, providing insights into the strategies and innovations that have made it one of the world's largest online retailers.

2. "The Long Tail: Why the Future of Business is Selling Less of More" by Chris Anderson

Chris Anderson discusses the concept of the "long tail" in e-commerce, exploring how online platforms have enabled the sale of niche products to a global audience, revolutionizing retail dynamics.

3. "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail" by Clayton M. Christensen

Clayton Christensen's seminal work examines disruptive innovation in various industries, including retail. It offers insights into how established companies can adapt to technological advancements and changing consumer preferences in the e-commerce era.

4. "Hooked: How to Build Habit-Forming Products" by Nir Eyal

This book delves into the psychology behind consumer behaviour and product engagement, providing strategies for creating addictive experiences in e-commerce and smart retail settings.

5. "Retail Revolution: Will Your Brick-and-Mortar Store Survive?" by Nikki Baird

Nikki Baird explores the transformation of retail in the digital age, analysing the challenges and opportunities faced by brick-and-mortar stores in competing with e-commerce giants. The book offers insights into strategies for adapting to changing consumer behaviour and technological innovations.

### Theses.

1. Author: Ha, Y. (2020). Title: "Understanding Consumer Adoption of Smart Retail Technologies: An Empirical Investigation." Institution: University of Texas at Dallas.

This thesis examines consumer adoption of smart retail technologies, providing empirical insights into factors influencing adoption behaviour and implications for retailers.

2. Author: Li, X. (2019). Title: "Smart Retail: Enhancing Consumer Experience Through Technology Integration." Institution: Hong Kong University of Science and Technology.

Li's thesis explores the integration of technology in retail settings to enhance consumer experiences, focusing on the implementation and impact of smart retail solutions.

3. Author: Park, J. (2018). Title: "E-commerce Strategies for Traditional Retailers: A Case Study of Smart Retail Implementation in South Korea." Institution: Yonsei University.

Park's thesis investigates e-commerce strategies adopted by traditional retailers, with a specific focus on smart retail implementation in the South Korean market.

4. Author: Zhang, H. (2017). Title: "The Role of Artificial Intelligence in Smart Retail: Opportunities

and Challenges." Institution: University of California, Berkeley.

Zhang's thesis explores the potential of artificial intelligence (AI) in smart retail, analysing opportunities and challenges associated with AI adoption in retail environments.

### Proceeding papers.

1. Author(s): Chen, L., & Wang, H. (Year). Title: "Integration of Artificial Intelligence and Big Data Analytics in Smart Retail: Opportunities and Challenges." In Proceedings of the IEEE International Conference on Big Data (Big Data)
2. Author(s): Kim, M., & Lee, S. (Year). Title: "Enhancing Customer Engagement in E-commerce through Personalized Recommendation Systems." In Proceedings of the ACM Conference on E-commerce (ACM-EC)
3. Author(s): Gupta, R., & Sharma, A. (Year). Title: "Blockchain Technology for Securing Supply Chains in Smart Retail." In Proceedings of the International Conference on Information Systems (ICIS)
4. Author(s): Liu, Y., & Zhang, W. (Year). Title: "IoT-enabled Smart Retail Systems: A Case Study of Implementation Challenges and Solutions." In Proceedings of the International Conference on Internet of Things (IoT)