Design and Implementation of a

Mobile Application that Connects Consumers to Nearby Vendors

**BY**

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**IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING, FACULTY OF COMPUTING AND APPLIED SCIENCE, BAZE UNIVERSITY, ABUJA.**

**January, 2025**

# DECLARATION

I hereby declare that this research project has been written by me under the supervision of Dr. Usman Bello Abubakar. The work has been presented in any previous research for the award of B.Sc degree to the best of my knowledge. The work is entirely mine and I accept the sole responsibility for any errors that might be found in the work, while the reference to publish material have been duly acknowledged.

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# CERTIFICATION

This project entitled “Design and Implementation of a mobile application that connects consumers to nearby vendors” meets the requirements governing the award of Bachelor of Science in Software Engineering in Baze University, Abuja.

# APPROVAL

# This is to certify that the research work title Design and Implementation of a mobile application that connects consumers to nearby vendors by Hadiza Aliyu with BU/22A/IT/6545 has been approved by the Department of Computer Science, Faculty of Computing and Applied Science, Baze University, Abuja, Nigeria.

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# DEDICATION

# ACKNOWLEDGEMENT

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# CHAPTER ONE

# INTRODUCTION

1.1 Overview

The FindNearMe mobile application is designed to bridge the gap between local buyers and sellers. The primary objective of the app is to provide a seamless, efficient, and secure platform for discovering, purchasing, and selling items within local communities. This not only promotes environmental sustainability by encouraging local transactions but it also boosts local commerce by supporting small businesses. This can significantly aid in addressing Nigeria's declining economic growth.

By leveraging advanced technologies such as AI-powered image recognition and real-time mapping services, this system aims to apply a geotagging based approach to retail. The key features of this application include; Image Recognition and Matching for Product Search, Location-Based Search & Interactive Maps, Seller and Buyer Accounts, Seller Profiles and In-App Messaging which will be further discussed in this report.

1.2 Background and Motivation

In recent years, the global landscape of commerce has witnessed a significant shift towards digital platforms and online marketplaces. According to eMarketer (2021), global e-commerce sales reached $4.28 trillion in 2020 . While this transformation has brought convenience and accessibility to consumers worldwide, it has also posed challenges for local businesses, particularly small and medium-sized enterprises (SMEs) in developing countries like Nigeria. These businesses often struggle to compete with larger, more established online retailers, resulting in decreased visibility and sales opportunities.

The motivation behind the FindNearMe app stems from the need to support local commerce, empower small businesses, and enhance the overall shopping experience for consumers in Nigeria. Consumers frequently face difficulties in finding specific items locally, leading to time-consuming searches. The app simplifies and expedites this process by enabling users to find products through AI-powered image recognition and detailed local listings.Long-distance shipping associated with online shopping contributes to carbon emissions and environmental degradation. FindNearMe encourages the purchase of locally produced goods, which often have a smaller carbon footprint compared to imported items. Small businesses in Nigeria often struggle with limited visibility and reach. FindNearMe provides a platform for these businesses to showcase their products to a broader local audience, helping them compete with larger retailers. By promoting local businesses, the app contributes to economic growth and job creation, fostering a thriving local economy.

The proposed project aims to design and develop the FindNearMe app, which will use AI-powered image recognition and real-time mapping to enhance local business visibility, simplify product discovery for consumers while promoting sustainable practices and fostering community engagement.

1.3 Statement of the Problem

Despite the growing digital landscape and increased smartphone penetration in Nigeria, local commerce faces several critical challenges. Consumers still find it difficult to locate specific items locally, as noted by a Nigerian Communications Commission survey where 60% of consumers cited difficulties in finding local products.

The rise of online shopping has also increased long-distance shipping, contributing to higher carbon emissions and environmental degradation. Additionally, the lack of a platform to foster local interactions and collaborations results in disconnected communities and underutilized local economies.

The FindNearMe app aims to address these challenges by enhancing visibility for local businesses, simplifying product discovery for consumers, promoting sustainable practices, and fostering community engagement. By leveraging AI-powered image recognition and real-time mapping services, the app provides a seamless platform for local commerce, contributing to Nigeria's socio-economic development.

1.4 Aims and Objectives

**1.4.1 Aims**

The Aim of this project is to design and implement a user-friendly mobile application that connects consumers to nearby vendors.

**1.4.2 Objectives**

1. To integrate AI-powered image recognition to allow users to scan items and find similar products.
2. To implement real-time mapping features to provide users with directions to local sellers.
3. To integrate geotagging functionality to accurately connect buyers to nearby sellers.
4. To develop an in-app messaging system for seamless communication between buyers and sellers.
5. To design and implement a review and rating system to build trust and reliability among users.

1.5 Significance

The FindNearMe mobile application holds significant potential to transform local commerce in Nigeria by providing a comprehensive solution that benefits both consumers and local businesses. Its significance lies in its ability to make local shopping more convenient, environmentally friendly, and supportive of community growth and development.

1. **Improving Consumer Convenience:** The AI-powered image recognition feature allows consumers to find products easily by simply scanning items, eliminating the need for extensive searches and making shopping more convenient. Integration with mapping services like Google Maps, along with geotagging, provides users with accurate directions to seller locations, ensuring they can quickly and easily find what they are looking for.The app also provides comprehensive product information, reviews, and ratings, helping consumers make informed purchasing decisions.
2. **Empowering Local Businesses:** The app offers a platform for local businesses to showcase their products to a wider audience, which helps them overcome the limitations of traditional brick-and-mortar stores. By allowing sellers to upload images and details of their products, the app serves as an effective marketing tool that can attract more customers and drive sales. Supporting local businesses through the app contributes to the overall economic growth of the community by creating jobs and increasing local revenue.
3. **Promoting Sustainable Practices:** By encouraging local transactions, the app helps reduce the need for long-distance shipping, thereby lowering carbon emissions associated with transportation. Furthermore, promoting the purchase of locally produced goods supports sustainable consumption patterns and reduces the environmental impact of goods distribution.
4. **Strengthening Community Ties:** The app fosters trust between buyers and sellers through secure transactions, ratings, and reviews, creating a trustworthy marketplace. By facilitating local transactions, the app promotes interactions within the community, contributing to stronger social ties and community support. In addition, supporting local businesses helps retain money within the community, which can be reinvested in local infrastructure and services.
5. **Leveraging Advanced Technologies:** The use of advanced AI technologies for image recognition enhances the user experience by making product discovery quick and intuitive. Accurate geotagging and integration with mapping services improve the reliability and accuracy of search results, enhancing the overall usability of the app.

1.6 Project Risks Assessment

These are a few risks that can come up in the advancement of this project and recommended ways the risk may possibly be avoided.

**Table 1.1: Risk Assessment of the Project and Mitigation Strategies**

| Risk | Risk Mitigation |
| --- | --- |
| Low User Adoption: The app might fail to attract a sufficient number of users or users may hesitate accommodating the app. | Conducting market research to understand user needs and preferences and creating a user-friendly interface and a seamless user experience. Develop a comprehensive marketing strategy that includes online campaigns, partnerships with local businesses, and promotions. Implement a feedback mechanism to gather user input and continuously improve the app. |
| System Integration Failures: Might encounter difficulty in integrating AI, image recognition, geotagging, and mapping technologies seamlessly. | Conduct thorough research and testing of APIs and software development kits (SDKs) before full integration. Furthermore, integrate components incrementally and test each integration thoroughly before moving on to the next. Also implement unit testing, integration testing, and system testing to catch and resolve issues early. |
| Data privacy and security breaches involving unauthorized access, use, or disclosure of sensitive user data. | Use strong encryption methods to protect data at rest and in transit. Ensure compliance with data protection regulations such as GDPR and NDPR. Also educate users about best practices for protecting their accounts, such as using strong passwords and recognizing phishing attempts. |
| Scalability issues may arise when the application grows and is unable to handle increased load and user traffic. | Design the application with scalability in mind. Utilize cloud services that can easily scale up resources based on demand (e.g., AWS, Google Cloud, Azure). Conduct regular performance and load testing to ensure the application can handle increased traffic. |
| Intellectual property (IP) issues may arise when there are disputes over the ownership, usage, or rights to the app’s technology, content, or branding. This can lead to legal challenges and potentially significant financial losses. | Conduct thorough research to ensure that all software components, technologies, and content used in the app are properly licensed and do not infringe on existing IP. Draft clear agreements with all stakeholders regarding IP ownership and usage rights. |

1.7 Scope/ Project Organization

This document outlines the activities and processes involved in developing a mobile application designed to connect consumers with nearby vendors. The app aims to enhance the shopping experience for consumers while boosting the visibility of local vendors. The scope and organization of the project are outlined as follows:

1.7.1 Scope

The scope of the FindNearMe app project encompasses the development, deployment, and maintenance of a mobile application designed to connect buyers with local sellers through advanced technologies. The app will facilitate local commerce by providing features such as AI-powered image recognition, geotagging and mapping.

**Key Functionalities include:**

1. Creation of separate accounts for buyers and sellers. As well as profile management for both account types.
2. Product listings, categorization and geotagging. Sellers can also upload pictures and details of their products.
3. AI-Powered image scanning and matching of scanned products with listings from local sellers.
4. Reservation of items for a limited time, so buyers can reserve items they want before they get to the seller's location.
5. Integration with mapping services like Google Maps to provide directions to seller locations, and display nearby sellers on a map.
6. Allowing buyers to rate and review sellers and displaying ratings and reviews on seller profiles.
7. Real-time notifications for new messages and nearby product listings.

1.7.2 Project Organization

The report consists of five chapters as outlined below:

Chapter 1: provides a general overview of what the whole project is all about such as background and motivation, statement of the problem, aims and objectives, significance of the project, and project risk assessment.

Chapter 2: provides Literature Review, introduction, historical overview, related work and summary.

Chapter 3: This chapter depicts the Requirement Analysis and Design.

Chapter 4: This includes the implementation and testing of the project’s components

Chapter 5: Discussion, conclusion, and recommendation are in this chapter. Finally the reference and appendices are in the last part of the report.

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# Chapter 2

# Literature Review

# 

2.1 Introduction

The rapid evolution of e-commerce and mobile technology has significantly transformed the landscape of retail and local commerce. In recent years, there has been a growing interest in location-based services and peer-to-peer marketplace applications that facilitate local transactions. This literature review aims to explore the historical context, theoretical foundations, and current state of research related to location-based marketplace applications, with a particular focus on their potential impact on local economies and sustainability.

The FindNearMe application, which is the subject of this study, builds upon existing research and technologies in areas such as geolocation services, image recognition, and peer-to-peer marketplaces. By examining the literature in these fields, we can better understand the potential impact and novelty of the FindNearMe app in the context of local commerce and sustainability efforts in Nigeria.

2.2 Historical Overview

The development of mobile commerce has revolutionized consumer behavior and the retail industry. The rise of online shopping began in the early 1990s with the advent of the internet and the establishment of pioneering e-commerce platforms like Amazon and eBay.

Amazon, which started as an online bookstore in 1994, rapidly expanded its product offerings and established itself as a dominant force in the retail sector (Kotha, 1998). The company's innovative approach to online retailing, including features such as personalized recommendations and customer reviews, set the standard for future e-commerce platforms. Online shopping has grown steadily in popularity in recent years. In 2021, global online retail sales amounted to almost five trillion U.S. dollars, a figure expected to exceed seven trillion U.S. dollars by 2025 (Coppola,2024).

During the 2000s, the proliferation of broadband internet significantly enhanced the accessibility and efficiency of online shopping. This era also witnessed the rise of digital marketplaces like Alibaba in China, which broadened the scope of e-commerce by connecting buyers and sellers on an unprecedented scale. Alibaba’s success, particularly with platforms like Taobao, demonstrated the potential of e-commerce in emerging markets and highlighted the growing importance of online shopping in global retail .

The concept of location-based services (LBS) in mobile applications can be traced back to the early 2000s, following the removal of selective availability from GPS signals by the U.S. government in 2000 (Küpper, 2005). This technological advancement paved the way for the development of various location-aware applications and services.

The late 2000s and early 2010s marked a significant shift with the advent of smartphones and the development of mobile commerce (m-commerce). Mobile applications like Amazon’s mobile app and Alibaba’s Taobao app provided users with a seamless shopping experience, integrating features such as personalized recommendations, push notifications, and one-click purchasing. According to Statista’s Market Insights, mobile e-commerce sales reached $2.2 trillion in 2023 and now make up 60 percent of all e-commerce sales around the world.(Buchholz, 2023).

Mobile technology has significantly altered consumer behavior, allowing users to engage in real-time transactions and access local products with unprecedented ease. Research indicates that the convenience of mobile applications has led to an increase in impulse buying and spontaneous purchases, as users can quickly browse and buy items within their vicinity (Gao et al., 2019).

Local commerce has a rich history rooted in traditional marketplaces, where community members engaged in face-to-face exchanges of goods and services. These markets fostered social interaction and economic relationships within localities. Historically, markets served not only as venues for trade but also as social hubs that reinforced community ties (Klein, 2018).

Platforms such as Craigslist and Facebook Marketplace have pioneered localized online transactions, emphasizing the importance of community engagement and trust in buyer-seller relationships (Huang & Benyoucef, 2017).

The role of AI in enhancing user experience has also garnered significant attention. Johnson and Lee (2022) demonstrated that AI-powered image recognition technology could improve product search accuracy, leading to higher user satisfaction. Their research indicated that users could upload images of items they wish to purchase, streamlining the search process and facilitating quicker transactions.

In accordance to Sachdev (2024), 85% of consumers identify visual information as the most influential factor in their purchasing decisions, while retailers utilizing this technology saw a 48% increase in order value. AI-powered image recognition technology, such as Google Lens and Amazon's visual search, allows users to search for products using images instead of text, improving the accuracy of search results and providing a more intuitive shopping experience .

Geotagging and mapping technologies have also evolved significantly, becoming integral components of many mobile applications. Google Maps, launched in 2005, revolutionized the way users navigate and interact with geographic data. In an article by the vice president of engineering, google maps, Reid (2020) titled “A look back at 15 years of mapping the world”, it stated that Google Maps is used by more than 1 billion people all over the world every month and more than 5 million websites and apps use Google Maps Platform every week.

The integration of GPS technology enabled real-time location tracking, making it possible to provide personalized recommendations based on the user's location . Geolocation services allow users to find products and services available in their immediate area, thereby promoting local businesses and fostering a sense of community (Liu et al., 2021). Applications such as Yelp and TripAdvisor have leveraged these technologies to offer location-specific recommendations and reviews, enhancing the relevance and utility of their services.

The evolution of mobile marketplace apps can be seen as a convergence of several technological trends:

1. E-commerce platforms: The rise of online marketplaces like eBay and Amazon in the late 1990s and early 2000s demonstrated the potential of peer-to-peer and business-to-consumer digital transactions (Laudon & Traver, 2017).

2. Social networking: The proliferation of social media platforms in the mid-2000s, such as Facebook and Twitter, highlighted the power of user-generated content and social connections in digital spaces (Boyd & Ellison, 2007).

3. Smartphone revolution: The introduction of the iPhone in 2007 and the subsequent smartphone boom made powerful, internet-connected devices with GPS capabilities widely accessible (West & Mace, 2010).

4. App ecosystems: The launch of app stores by Apple and Google in 2008 created a thriving ecosystem for mobile applications, including those focused on local commerce (Holzer & Ondrus, 2011).

These technological advancements in online shopping, AI, and geotagging have laid the groundwork for the development of innovative applications like FindNearMe. By leveraging AI-powered image recognition, real-time mapping, and geotagging technologies, FindNearMe aims to bridge the gap between local buyers and sellers, enhancing local commerce and fostering community engagement.

2.3 Related Work

The conceptual foundations and technological developments underpinning the FindNearMe application are multifaceted, drawing from a diverse body of research across various disciplines. A comprehensive understanding of this related work is essential in positioning the FindNearMe app within the broader context of location-based services, mobile commerce, and sustainable development.

**2.3.1 Concept of E-commerce**

Geelan (2009) defines e-Commerce as transactions undertaken over the Internet, either by consumers purchasing products and/or services or between enterprises.In other terms, e-Commerce is a "global phenomenon (in commerce) that is taking place over a wired/virtual marketplace" (Laudon & Traver, 2007). The definition of the word 'electronic commerce' has evolved throughout time. Previously, 'electronic commerce' was defined as the electronic facilitation of commercial transactions, typically using technologies such as Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT), which were introduced in the late 1970s, for example, to send commercial documents such as purchase orders or invoices electronically (Geelan, 2009; Miers, 1996).However, technical advancements today allow for the animation of products and services, as well as the fast payment for them online. The pace of delivery varies widely depending on the type of service or items, although software and associated (online) products might be supplied immediately to the customer's email box on the computer. Thus, Xiao and Benbasat (2007) define e-Commerce as the entire collection of operations that support/enable commercial business activities over an electronic network.

**2.3.2 Application of E-commerce**

Miers (1996) describes e-Commerce as the most fundamental development since paper money was established. Companies are funding three primary types of e-commerce applications: These include business-to-consumer (B2C), business-to-business (B2B), and customer-to-customer (C2C). However, B2C and B2B are thought to be the most common kinds of e-commerce. According to O'Brien (2001), the most popular forms of e-commerce transactions in the United States and other developed countries of the world are B2B and B2C.

### 2.3.3 Location-Based Services in Mobile Applications

At the core of the FindNearMe app is the integration of location-based services (LBS), which have become increasingly prevalent in modern mobile applications. Dhar and Varshney (2011) provide a thorough overview of LBS, emphasizing their architectural components, key technologies, and diverse application domains. The authors highlight the critical role of positioning systems, communication networks, and service providers in delivering effective LBS that can enhance user experiences and enable novel use cases.

In the specific realm of e-commerce and local marketplaces, LBS have proven to be a powerful tool for connecting users with relevant products, services, and commercial opportunities within their proximity. Bao et al. (2015) propose a location-aware recommender system that leverages geographical information and user preferences to suggest point-of-interest (POI) recommendations, a concept that holds significant promise for location-based marketplace apps like FindNearMe. Their work demonstrates the potential of seamlessly integrating spatial data with user-centric features to foster more personalized and engaging shopping experiences.

### 2.3.4 Image Recognition in E-Commerce

The FindNearMe app's incorporation of AI-powered image recognition capabilities builds upon the growing body of research in this field, particularly in the context of e-commerce applications. Zhu et al. (2017) present a comprehensive survey of deep learning-based image recognition methods, discussing the application of techniques such as convolutional neural networks (CNNs) and region-based CNNs (R-CNNs) for product recognition and classification tasks. These advancements in computer vision have the potential to revolutionize the way users search for and discover products in digital marketplaces.

Extending the research on mobile visual search, Yue et al. (2019) demonstrate the effectiveness of a mobile-optimized system that combines deep learning-based image recognition with efficient indexing methods. Their work highlights the importance of delivering low-latency, high-accuracy visual search capabilities, a critical consideration for the FindNearMe app's image matching feature, which aims to enable seamless product discovery within local communities.

One particularly enlightening study conducted by Jiang et al. (2021) delves into the profound impact of visual search on consumer behavior within e-commerce environments. The authors found that when users were equipped with the ability to search for products using images rather than text, there was a marked increase in conversion rates and average order values. This finding is particularly compelling, as it suggests that visual search not only streamlines the product discovery process but also taps into the impulsive nature of consumer behavior. By allowing users to engage with products visually, e-commerce platforms can create an environment that encourages spontaneous purchases, thereby enhancing overall sales performance.

### 2.3.5 Peer-to-Peer Marketplaces and Local Commerce

The FindNearMe app's peer-to-peer (P2P) marketplace approach is informed by the substantial research on the rise of sharing economy platforms and their impact on local commerce. Hamari et al. (2016) explore the key motivations underlying participation in the sharing economy, identifying factors such as sustainability, enjoyment, and economic benefits. These insights are highly relevant to understanding the potential user adoption and engagement with the FindNearMe app, as it aims to promote local transactions and environmental sustainability.

Furthermore, studies on the economic impacts of P2P marketplaces provide valuable context for assessing the potential effects of the FindNearMe app on local retail businesses. Zervas et al. (2017), for instance, examine the impact of Airbnb on the hotel industry, demonstrating how such platforms can disrupt traditional business models. While their research focuses on a different sector, their methodological approach for evaluating economic impacts could be adapted to investigate the influence of location-based marketplace apps like FindNearMe on local commerce in Nigeria.

The integration of seller profiles and in-app messaging functionalities within the FindNearMe app also draws upon research on social interaction design and user engagement in digital marketplaces. Masden et al. (2014), for example, explore the challenges and opportunities associated with scaling social media platforms within local communities, providing insights that could inform the development of the FindNearMe app's communication and collaboration features.

### 2.3.6 Mobile Applications for Sustainable Development

Environmental sustainability is another critical aspect of local commerce. Thompson (2023) highlighted that local transactions contribute to reducing carbon emissions by minimizing transportation needs. By promoting local purchasing, applications can play a pivotal role in fostering sustainable practices and supporting community resilience. This aspect is particularly relevant in Nigeria, where environmental challenges are increasingly pressing. The promotion of local commerce can lead to reduced reliance on imported goods, thereby supporting local manufacturers and reducing the carbon footprint associated with long-distance transportation.

The potential of mobile applications to contribute to sustainable development, particularly in the context of developing countries, has been a subject of growing interest in the literature. Heeks (2008) introduces the concept of "ICT4D 2.0," emphasizing the transformative role of mobile technologies in addressing development challenges. This framework provides a valuable lens through which to examine the FindNearMe app's objectives of supporting local commerce and addressing economic issues in Nigeria.

Building on this foundation, Kikulwe et al. (2014) investigate the impact of mobile money services on smallholder farmers in Kenya, demonstrating how mobile technologies can facilitate economic transactions and improve livelihoods in developing contexts. Their findings suggest that similar benefits could be realized through the adoption of location-based marketplace apps like FindNearMe, which aim to empower local communities and foster sustainable economic growth.

### 2.3.7 Geotagging and Spatial Analysis in Retail

The FindNearMe app's geotagging-based approach to retail is informed by existing research in the field of spatial analysis and geographical information systems (GIS) in the retail sector. Roig-Tierno et al. (2013) showcase the effective use of GIS for retail site location decision-making, highlighting the importance of spatial data in understanding market dynamics and customer behavior.

In the context of mobile applications, Shankar et al. (2016) explore the concept of "smart retailing," which involves the integration of technologies such as IoT, augmented reality, and location-based services to enhance the shopping experience. Their work provides a valuable conceptual framework for understanding how location-based marketplace apps like FindNearMe can contribute to the evolution of retail in the digital age, catering to the changing needs and expectations of tech-savvy consumers.

However, challenges persist in the adoption of local e-commerce platforms. Yousef et al. (2022) identified trust and security concerns as significant barriers to user engagement in Nigeria. Users expressed hesitation in engaging with unfamiliar sellers, underscoring the need for robust verification systems and transparent transaction processes. The study found that users are more likely to engage in transactions when they feel confident in the security measures implemented by the platform, such as user reviews, seller ratings, and secure payment options.

Additionally, the digital divide in Nigeria poses a significant barrier to the widespread adoption of local e-commerce platforms. Many potential users lack access to reliable internet services or smartphones, limiting their ability to engage in mobile commerce. Addressing these challenges is crucial for the success of applications like FindNearMe, which aim to bridge the gap between local buyers and sellers.

**Table 2.1 Comparative Analysis of the Related Works**

| **Study** | **Focus** | **Key Findings** | **Strengths** | **Limitations** |
| --- | --- | --- | --- | --- |
| Zhu et al. (2017) | Image recognition in e-commerce | - Survey of deep learning methods for image recognition  - Discussion of CNNs and R-CNNs for product classification | Directly applicable to image recognition and matching for product search | - Limited focus on mobile applications  - Does not address real-time performance issues |
| Yue et al. (2019) | Mobile visual search | - Demonstration of efficient large-scale mobile visual product search  - Low-latency, high-accuracy results | Informs implementation of image-based product discovery on mobile platforms | Focused on large-scale applications, may need adaptation for local markets |
| Dhar & Varshney (2011) | Location-based services | - Overview of LBS components and technologies  - Discussion of business models for mobile LBS | Provides foundation for location-based search and interactive maps | Older study, may not reflect latest technological advancements |
| Bao et al. (2015) | Location-aware recommender systems | - Proposal of a system leveraging geographical information and user preferences  - Application to POI recommendations | Directly applicable to location-based search and product recommendations | - Focused on social networks, may need adaptation for marketplace context |
| Roig-Tierno et al. (2013) | GIS in retail | - Demonstration of GIS use in retail site location decisions  - Importance of spatial analysis in understanding market dynamics | Informs design of location-based search and mapping features | Focused on business decision-making rather than consumer applications |
| Hamari et al. (2016) | Sharing economy motivations | - Identification of key factors driving participation in sharing economy  - Insights into user motivations | Informs design of seller and buyer accounts, profiles, and overall platform engagement | Broad focus on sharing economy, may need specific application to local marketplaces |
| Zervas et al. (2017) | Economic impact of P2P platforms | - Analysis of Airbnb's impact on hotel industry  - Demonstration of P2P platforms' disruptive potential | Provides context for potential economic impact of FindNearMe on local commerce | Focused on hospitality sector, may need adaptation for retail context |
| Masden et al. (2014) | Community social media scaling | - Exploration of challenges in scaling local social media platforms  - Insights into community engagement | Informs development of in-app messaging and community features | Focused on social media rather than marketplaces, may need adaptation |
| Shankar et al. (2016) | Smart retailing | - Discussion of technologies enhancing shopping experiences  - Importance of personalization and real-time engagement | Relevant to notifications, alerts, and overall user engagement strategies | Broad focus on retail technologies, may need specific application to P2P marketplaces |
| Kikulwe et al. (2014) | Mobile money impact in developing countries | - Analysis of mobile money's impact on smallholder farmers  - Demonstration of mobile technology's potential in improving livelihoods | Provides context for potential impact of FindNearMe in Nigerian context | Focused on mobile money rather than marketplaces, may need adaptation |

2.4 Summary

This chapter has provided a comprehensive review of the literature relevant to the development and implementation of the FindNearMe mobile application. By exploring various research areas and technological advancements, we have established a solid foundation for understanding the potential impact and novelty of the FindNearMe app in the context of local commerce and sustainability efforts in Nigeria.

The review began by tracing the evolution of location-based services and mobile marketplace applications, highlighting the convergence of e-commerce, social networking, and mobile technologies that enabled innovations like FindNearMe.

Key research areas underpinning FindNearMe's features were explored:

1. Image Recognition: Studies by Zhu et al. (2017) and Yue et al. (2019) demonstrated advancements in deep learning-based image recognition, crucial for FindNearMe's product search functionality.
2. Location-Based Services: Work by Dhar and Varshney (2011) and Bao et al. (2015) provided insights into LBS technologies and location-aware recommender systems, informing FindNearMe's mapping and search features.
3. Peer-to-Peer Marketplaces: Research by Hamari et al. (2016) and Zervas et al. (2017) on sharing economic motivations and economic impacts offers valuable context for FindNearMe's marketplace approach.
4. User Engagement: Shankar et al. 's (2016) work on "smart retailing" informs FindNearMe's notification, review, and rating systems.

The broader context of mobile applications for sustainable development was considered, drawing on Heeks' (2008) "ICT4D 2.0" concept and Kikulwe et al. 's (2014) study on mobile money's impact in developing countries.

Key themes emerged:

1. The integration of advanced technologies in mobile commerce applications.
2. The disruptive potential of peer-to-peer marketplaces.
3. The importance of user experience in driving adoption.
4. The role of mobile technologies in sustainable development.

Research gaps were identified, including limited studies on location-based marketplaces in Nigeria and the need for more research on long-term economic impacts of such platforms.

In conclusion, this review positions FindNearMe at the intersection of several cutting-edge fields, highlighting its potential to contribute to local commerce and sustainable economic development in Nigeria. Future research could further explore the specific challenges and opportunities of implementing such technologies in the Nigerian market.

# REFERENCES

(eMarketer, 2021). “Global E-commerce Update 2021” <https://www.emarketer.com/content/global-ecommerce-update-2021>

Nigerian Communications Commission (NCC), 2021. *Consumer Survey on Digital Shopping Preferences*. Retrieved from [NCC](https://ncc.gov.ng).

Kotha, S. (1998). Competing on the Internet: The Case of Amazon.com. European Management Journal, 16(2), 212-222.

Coppola, D. (2024). “E-commerce as percentage of total retail sales worldwide from 2021 to 2027” <https://www.statista.com/statistics/534123/e-commerce-share-of-retail-sales-worldwide/>

Küpper, A. (2005). Location-based services: Fundamentals and operation. John Wiley & Sons.

Buchholz, K.(2023). “Global Mobile E-Commerce Worth $2.2 Trillion in 2023” <https://www.statista.com/chart/13139/estimated-worldwide-mobile-e-commerce-sales/>

Gao, Y., Zhang, Y., & Wang, Y. (2019). The influence of mobile commerce on consumer purchasing behavior: A study of Chinese consumers. \*Journal of Retailing and Consumer Services\*, 50, 1-8. <https://doi.org/10.1016/j.jretconser.2019.05.003>

Klein, J. (2018). The role of traditional markets in local economies: A historical overview. \*Economic History Review\*, 71(3), 745-762. <https://doi.org/10.1111/ehr.12652>

Huang, Z., & Benyoucef, M. (2017). User behavior in social commerce: A review of the literature. \*International Journal of Information Management\*, 37(6), 634-640. <https://doi.org/10.1016/j.ijinfomgt.2017.05.006>

Johnson, M., & Lee, S. (2022). Enhancing user experience in e-commerce through AI-powered image recognition. \*Computers in Human Behavior\*, 128, 107-115.

Sachdev, P. (2024). “How AI Empowers Image Recognition And Visual Search In Ecommerce” <https://inc42.com/resources/how-ai-empowers-image-recognition-and-visual-search-in-ecommerce/>

Reid, E. (2020). “A look back at 15 years of mapping the world”, <https://blog.google/products/maps/look-back-15-years-mapping-world/>.

Liu, Y., Zhang, Y., & Chen, Y. (2021). The impact of mobile technology on local commerce: A geolocation perspective. \*Journal of Business Research\*, 124, 205-213. <https://doi.org/10.1016/j.jbusres.2020.11.045>

Laudon, K. C., & Traver, C. G. (2017). E-commerce: Business, technology, society (13th ed.). Pearson.

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. Journal of Computer-Mediated Communication, 13(1), 210-230.<https://doi.org/10.1111/j.1083-6101.2007.00393.x>

West, J., & Mace, M. (2010). Browsing as the killer app: Explaining the rapid success of Apple's iPhone. Telecommunications Policy, 34(5-6), 270-286.<https://doi.org/10.1016/j.telpol.2009.12.002>

Holzer, A., & Ondrus, J. (2011). Mobile application market: A developer's perspective. Telematics and Informatics, 28(1), 22-31.<https://doi.org/10.1016/j.tele.2010.05.006>

Bao, J., Zheng, Y., Wilkie, D., & Mokbel, M. (2015). Recommendations in location-based social networks: A survey. GeoInformatica, 19(3), 525-565.<https://doi.org/10.1007/s10707-014-0220-8>

Dhar, S., & Varshney, U. (2011). Challenges and business models for mobile location-based services and advertising. Communications of the ACM, 54(5), 121-128.<https://doi.org/10.1145/1941487.1941515>

Hamari, J., Sjöklint, M., & Ukkonen, A. (2016). The sharing economy: Why people participate in collaborative consumption. Journal of the Association for Information Science and Technology, 67(9), 2047-2059.<https://doi.org/10.1002/asi.23552>

Heeks, R. (2008). ICT4D 2.0: The next phase of applying ICT for international development. Computer, 41(6), 26-33.<https://doi.org/10.1109/MC.2008.192>

Kikulwe, E. M., Fischer, E., & Qaim, M. (2014). Mobile money, smallholder farmers, and household welfare in Kenya. PloS One, 9(10), e109804.

Roig-Tierno, N., Baviera-Puig, A., Buitrago-Vera, J., & Mas-Verdu, F. (2013). The retail site location decision process using GIS and the analytical hierarchy process. Applied Geography, 40, 191-198.<https://doi.org/10.1016/j.apgeog.2013.03.005>

Shankar, V., Kleijnen, M., Ramanathan, S., Rizley, R., Holland, S., & Morrissey, S. (2016). Mobile shopper marketing: Key issues, current insights, and future research avenues. Journal of Interactive Marketing, 34, 37-48.<https://doi.org/10.1016/j.intmar.2016.03.002>

Yue, X., Quan, C., Ma, C., Zhu, L., Chen, T., Kan, W., Pang, Y., & Liu, Y. (2019). A deep learning approach for efficient large-scale mobile visual product search. Knowledge-Based Systems, 163, 588-597.<https://doi.org/10.1016/j.knosys.2018.09.022>

Jiang, Y., Chen, X., & Liu, Y. (2021). The impact of visual search on consumer behavior in e-commerce. *Journal of Retailing and Consumer Services, 60*, 102-456. <https://doi.org/10.1016/j.jretconser.2021.102456>

Zervas, G., Proserpio, D., & Byers, J. W. (2017). The rise of the sharing economy: Estimating the impact of Airbnb on the hotel industry. Journal of Marketing Research, 54(5), 687-705.<https://doi.org/10.1509/jmr.15.0204>

Zhu, L., Yang, Y., Huang, Y., & Wang, W. (2017). A study on deep learning for e-commerce image recognition. Proceedings of the 2017 International Conference on Deep Learning Technologies, 6-10.<https://doi.org/10.1145/3094243.3094258>

Masden, C. A., Grevet, C., Grinter, R. E., Gilbert, E., & Edwards, W. K. (2014). Tensions in scaling-up community social media: A multi-neighborhood study of Nextdoor. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, 3239-3248.<https://doi.org/10.1145/2556288.2557319>

Thompson, G. (2023). The role of local commerce in promoting environmental sustainability. \*Sustainability\*, 15(2), 123-135.

El-Ebiary, Y., Al Moaid, Y., Hassan, A., Al-Kofahi, M., Alqudah, O., Liban, A., Al-Hodiany, Z. M. , Hilles, S. (2022). E- Commerce Adoption: Problems facing SMEs in Nigeria. International Journal Of Special Education Vol.37, No.3 . DOI: [10.13140/RG.2.2.26526.00320](http://dx.doi.org/10.13140/RG.2.2.26526.00320)

Geelan, J. (2009). Twenty one experts define cloud computing, Cloud computing journal. Retrieved from <http://cloudcomputing.sys-con.com/node/612375>

Laudon, K. C., & Traver, C. G. (2007). E-commerce(Vol. 29). Pearson/Addison Wesley.

Miers, D., & Hutton, G. (1996). The strategic challenges of electronic commerce. Electronic commerce, Enix consulting limited, 1-19. Retrieved from: <http://enix.co.uk/electron.htm>.

Xiao, B., & Benbasat, I. (2007). E-commerce product recommendation agents: Use, characteristics, and impact. MIS Quarterly, 31(1), 137-209. Retrieved from: <http://dl.acm.org/citation.cfm?id=2017335>

O’Brien, J.A. (2010). Introduction to information systems: essentials for the internetworked e-business enterprise (10ed.). Boston: McGraw-Hill.