Design and Implementation of a

Mobile Application that Connects Consumers to Nearby Vendors

**BY**

**Hadiza Aliyu**

**BU/22A/IT/6545**

**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.**

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# 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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Hadiza Aliyu Date

BU/22A/IT/6545

**APPROVED BY**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Head of Department,**

Department of Computer Science

# 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.

By

Dr Usman Bello Abubakar

Supervisor Date

Dr Usman Idris Abubakar

Head of Department Date

Assoc Prof Chandrashekar V Uppin

Dean, Faculty of Computing and Applied Science Date

Prof Choji Davou Nyap

External Examiner Date

# DEDICATION

# ACKNOWLEDGEMENT

# *ABSTRACT*

# TABLE OF CONTENTS

**DECLARATION** 2

**CERTIFICATION** 3

**APPROVAL** 4

**DEDICATION** 5

**ACKNOWLEDGEMENT** 6

**ABSTRACT** 7

**TABLE OF CONTENT** 8

**LIST OF TABLES** 9

**LIST OF FIGURES** 9

**CHAPTER 1: INTRODUCTION** 10

1.1 Overview 10

1.2 Background and Motivation 10

1.3 Statement of the Problem 11

1.4 Aims and Objectives 11

1.4.1 Aims 12

1.4.2 Objectives 12

[1.5](https://docs.google.com/document/d/1LIHZjZ8lUFsSwqAyPIMEoezMQOm4kFFm/r/edit/edit#heading=h.z337ya)  Significance of the Project 12

1.6 Project Risks Assessment 13

1.7 Scope/Project Organization 13

1.7.1 Scope 14

1.7.2 Project Organization 15

# LIST OF TABLES

**Table 1.1: Project Risk Assessment**

# LIST OF FIGURES

# 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. Many SMEs struggle to compete with larger online retailers due to limited marketing resources and digital presence, with 85% of SMEs facing market access issues according to SMEDAN. Consumers 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.