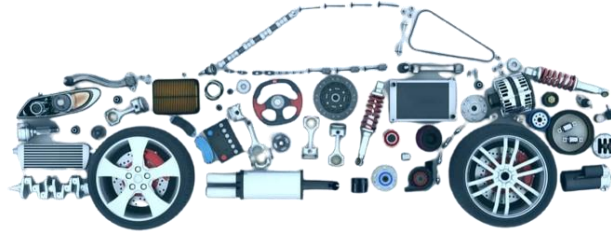


# **FINAL PROJECT DOCUMENTATION**

## **After Market Accelerators: Empowering Local Auto SMMEs with Digital Tools with “Vula Moto”**

**GARIDZIRA** Tinashe Crispen<sup>1</sup>, **MDZOBO** Malwande<sup>2</sup>, **CANDLOVU** Luthando<sup>3</sup>, **NTANJANA** Boneka<sup>4</sup>,  
**SEPTEMBER** Aneliswe Khanyisa<sup>5</sup>



I.	Table of Contents	
II.	Introduction .....	2
III.	Problem Statement.....	2
IV.	Objectives.....	2
V.	Solution .....	3
VI.	FIGURES .....	3
VII.	Target Users.....	5
VIII.	Impact & Benefits.....	5
	1. Economic Impact.....	5
	2. Social Impact.....	5
	3. Technological Impact.....	5
	4. Accessibility and Inclusion.....	5
	5. Environmental Impact .....	5
	6. Small Business Empowerment Mechanics and parts sellers who were previously disconnected from digital systems can now manage bookings, inventory, and customer relationships through the app. This enables them to formalize their operations, scale their services, and access wider market opportunities [1]. .....	5
IX.	Future Works .....	5
X.	Conclusion.....	5
XI.	REFERENCES .....	6

---

<sup>1</sup> BSc in Computer Science and Statistics, Technology Integration

<sup>2</sup> MSc in Computer Science, Developer

<sup>3</sup> Hons in Computer Science, Group Leader

<sup>4</sup> Hons in Computer Science, Software Tester

<sup>5</sup> Hons in Computer Science, Designer

## II. INTRODUCTION

In South Africa and other developing regions, local auto Small, Medium, and Micro Enterprises (SMMEs) are crucial in driving mobility and supporting economic livelihoods. However, these businesses often suffer from poor digital visibility, limited infrastructure, and disconnected operations, which restrict their growth and ability to attract new customers [1], [6]. Research has highlighted the positive impact of integrating digital tools into localized marketplaces, with evidence showing increased buyer-seller interactions through platforms like Facebook Marketplace when enhanced with artificial intelligence (AI) and deep learning models [2].

Furthermore, studies have shown that human-like AI chatbots significantly improve user trust, personalization, and negotiation willingness in e-commerce platforms [3]. This is particularly relevant in underserved markets where building trust between customers and informal service providers is essential. A study on bilateral rating systems found that enabling both customers and service providers to rate each other increases transparency and negotiation efficiency in peer-to-peer markets [4]. Moreover, prior-weighted rating models help prevent bias against new businesses, thereby promoting fairness and equal opportunities [5].

Despite the usefulness of these solutions, many of these studies did not implement or test these systems in the field, limiting their real-world application. Our project builds upon the findings from these studies to design and implement Vula Moto, a digital marketplace mobile application tailored to the unique needs of the automotive aftermarket sector. The platform aims to empower local auto SMMEs with real-time communication, service visibility, and smart support tools that modernize the way these businesses operate and interact with customers.

## III. PROBLEM STATEMENT

Auto-repair and auto-parts SMMEs in underserved regions face several persistent challenges:

- Poor online presence and discoverability

- Lack of digital tools for service listing and communication
- Informal business practices with no accountability systems
- Customer uncertainty regarding reliability and pricing
- Infrastructure and network limitations

As a result, customers struggle to find trustworthy service providers, particularly in emergency situations or when seeking verified mechanics. Most vehicle owners especially those uninsured rely on word-of-mouth recommendations, which limits the ability to compare services or find competitive prices.

The Vula Moto project directly addresses these issues by creating a mobile-based digital ecosystem that connects local mechanics and auto-parts sellers with customers. The app features service listings, real-time bookings, live chat, multilingual chatbot support, and a location-based search to enhance accessibility, visibility, and trust for both sides of the marketplace.

## IV. OBJECTIVES

This project aims to **digitize** the automotive aftermarket sector for local SMMEs by providing a comprehensive, user-friendly platform. The core objectives are to:

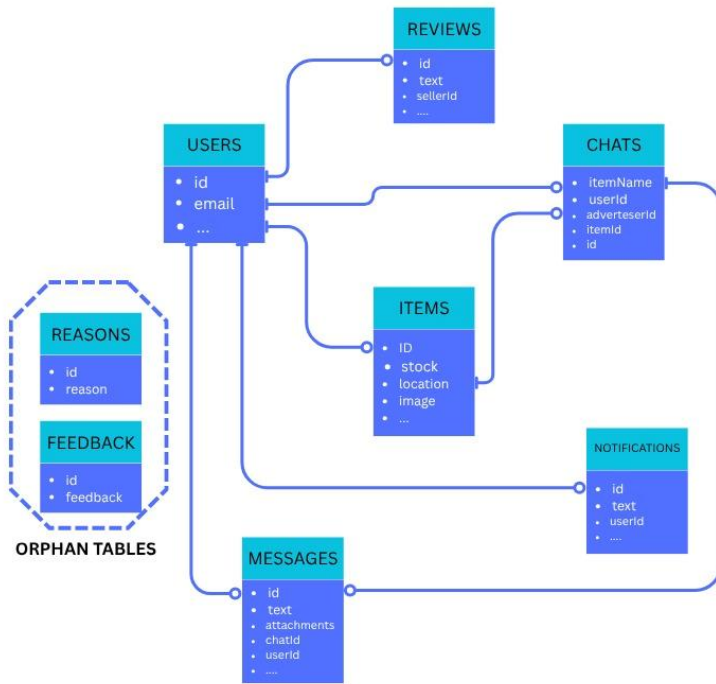
- Digitize Auto SMMEs: Provide digital tools for booking, communication, reviews, and inventory management.
- Improve Accessibility: Use a mobile-first approach that supports low-connectivity regions.
- Increase Trust: Introduce bilateral rating and verification systems.
- Empower Users: Support mechanics and customers with an AI-powered assistant and location-based services.
- Foster Growth: Create visibility and scalability for informal auto businesses.

## V. SOLUTION

To address the digital gap faced by local automotive SMMEs, this project introduces a unified marketplace platform that connects mechanics with both insured and uninsured vehicle owners. The platform offers real-time booking, end-to-end encrypted chat, AI-powered multilingual chatbot support, and

location-based filtering for nearby services and spare parts. It also includes service listings, inventory tracking, invoicing, analytics, and a top-rated mechanic system to promote trust and operational efficiency.

## VI. FIGURES



### ERD KEY SUMMARY

- This Entity-Relationship Diagram (**ERD**) represents the data structure of a mobile marketplace app.
- The system is centered around **USERS**, who can create **ITEMS**, engage in **CHATS**, and exchange **MESSAGES**.
- **CHATS** are item-based conversations between buyers and sellers.
- **REVIEWS** are linked to sellers, and **NOTIFICATIONS** are delivered to users.
- Two orphan tables, **REASONS** and **FEEDBACK**, are included for auxiliary data like report reasons and user feedback but are not connected to other entities.

Fig 1. ERD DIAGRAM.

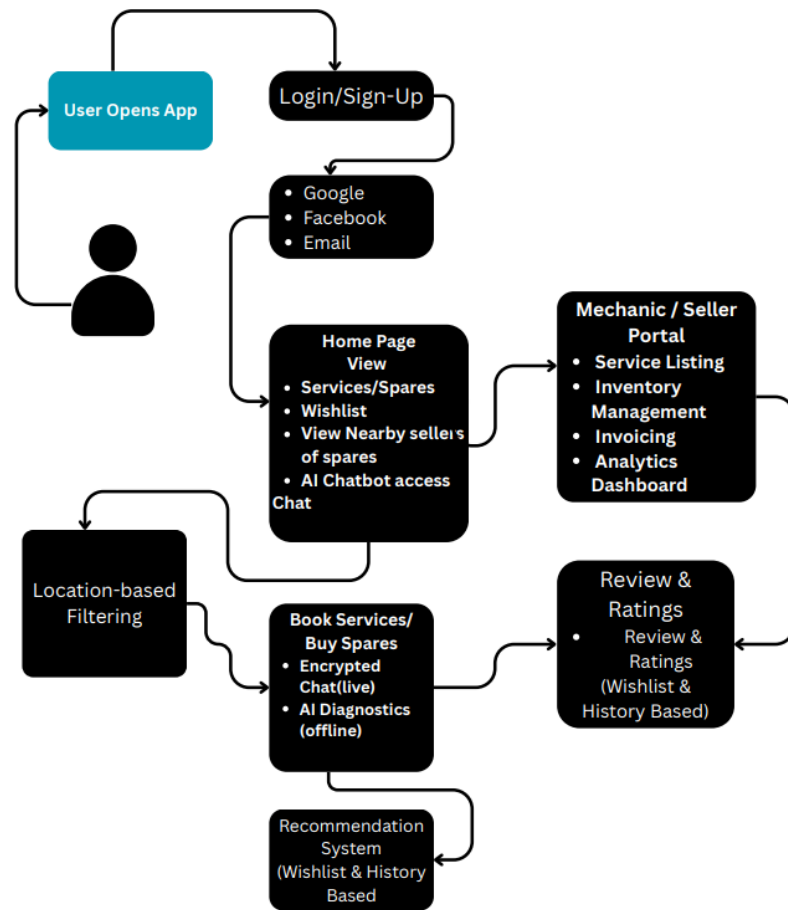


Fig 2. SYSTEM USE CASE OR USER JOURNEY

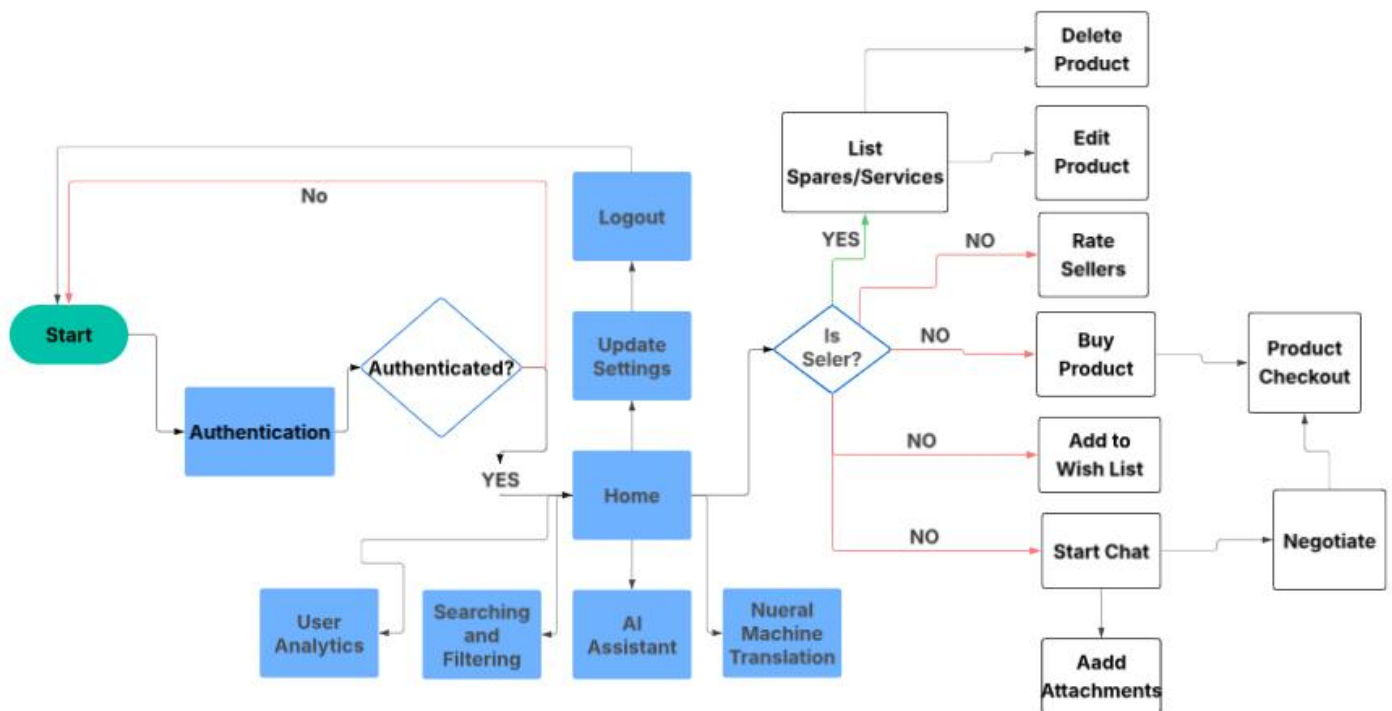


Fig 3. SKETCH, FLOW CHART OR CIRCUIT DIAGRAM

## VII. TARGET USERS

- Independent mechanics (formal and informal)
- Spare part resellers in low-income communities
- Uninsured and insured car owners
- Fleet managers or taxi associations

## VIII. IMPACT & BENEFITS

### 1. Economic Impact

The app improves visibility for small auto businesses, helping them reach more customers and increase revenue. By offering booking, ratings, and service listings, informal mechanics can digitize their operations and become more competitive in a growing digital economy [6].

### 2. Social Impact

By enabling bilateral ratings and real-time communication, the platform fosters transparency and trust between service providers and customers [4]. This leads to better service delivery, fewer disputes, and increased customer satisfaction in underserved communities.

### 3. Technological Impact

The use of AI-powered chatbots and personalized recommendation systems introduces advanced technology in informal sectors [2], [3]. This boosts digital literacy among users and encourages the adoption of smart tools to improve service efficiency [7].

### 4. Accessibility and Inclusion

Features like offline chatbot support and multilingual communication ensure that even users in low-connectivity or rural areas can benefit from the platform [10]. This promotes digital inclusivity and helps bridge the urban-rural tech gap.

### 5. Environmental Impact

Location-based search reduces unnecessary travel and fuel usage by connecting users with nearby services quickly. This leads to more efficient use of time and resources, contributing to reduced environmental strain and carbon emissions.

6. Small Business Empowerment Mechanics and parts sellers who were previously disconnected from digital systems can now manage bookings, inventory, and customer relationships through the app. This enables them to formalize their operations, scale their services, and access wider market opportunities [1].

## IX. FUTURE WORKS

- **Payment Integration:** We plan to integrate popular payment methods such as SnapScan, Zapper, and EFT into the app to enable seamless and secure transactions. This will simplify the payment process for customers and mechanics, reducing cash handling and increasing trust.
- **Training & Certification:** The platform will offer training programs and certification opportunities for mechanics and SMMEs to enhance their skills and professionalism. Certified users will be recognized within the app, helping customers identify trusted service providers.
- **AI Matching:** Artificial intelligence will be used to intelligently connect customers with the best nearby service providers based on factors like location, availability, and ratings. This will improve customer satisfaction by reducing search time and ensuring reliable, personalized service recommendations.

## X. CONCLUSION

Vula Moto is a mobile-based digital marketplace designed to empower local auto-repair SMMEs in South Africa and other underserved regions. It addresses key challenges such as poor visibility, lack of digital tools, and limited customer access by offering features like real-time booking, AI-powered multilingual chat support, secure communication, and a bilateral rating system.

The platform enhances trust, transparency, and operational efficiency for mechanics and spare part sellers while making it easier for customers to find reliable services. With future plans including mobile payments, fleet tools, and smart

diagnostics, Vula Moto aims to drive digital transformation and inclusive growth in the automotive aftermarket sector.

## XI. REFERENCES

- [1] M. Rakhra et al., "An In-Depth Analysis Of Local Mechanic Support For Immediately Apparent Repairs," ICEECT 2024, 2024.
- [2] R. Xi et al., "Aug2Search: Enhancing Facebook Marketplace Search with LLM-Generated Synthetic Data Augmentation," arXiv, 2025.
- [3] Y. Ding & M. Najaf, "Interactivity, humanness, and trust: a psychological approach to AI chatbot adoption in e-commerce," BMC Psychol., vol. 12, 2024.
- [4] T. T. Ke et al., "Peer-to-Peer Markets with Bilateral Ratings," Marketing Science, vol. 43, 2024.
- [5] T. Ma et al., "Balancing Producer Fairness and Efficiency via Prior-Weighted Rating System Design," ICWSM, vol. 19, 2025.
- [6] M. Sinha & L. Fukey, "Factors Affecting Digital Visibility of SMEs in India," Vision, vol. 29, 2025.
- [7] N. Natalia & P. Hermawan, "Unlocking Potential: Digital Transformation in Automotive Repair," IJEBCE, vol. 4, 2024.
- [8] M. Usama Riaz, "Comparative Analysis of React Native, Kotlin, and Flutter," 2025.
- [9] S. Sharma & J. KP, "Security Analysis of OAuth 2.0 Implementation," IEEE i-PACT, 2023.
- [10] C. Le, "Privacy-Preserving Real-Time Vietnamese-English Translation using Edge AI," arXiv, 2025.
- [11] M. C. Chiu et al., "Personalized Recommendation in Smart Product Service Systems," Computers in Industry, vol. 128, 2021.