



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

# IJRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 5, May 2023

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

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# Pheriwala: An Android App for Street Vendors

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**ABSTRACT:** The rapid growth of urban markets and the significant role played by street vendors in local economies call for innovative solutions to enhance their accessibility and efficiency. This research paper focuses on the development of a mobile application designed specifically for street vendors, aimed at streamlining their operations and improving customer engagement. By leveraging the potential of mobile technology and location-based services, the application aims to bridge the gap between street vendors and customers, facilitating seamless interactions and transactions. The research paper explores the key features, functionalities, and benefits of the mobile application for street vendors. It delves into the methodology employed for problem-solving and the adoption of the Agile software development life cycle model. The paper also discusses the tools and technologies utilized, including Flutter for the frontend, Spring Boot and MySQL for the backend, and Firebase Cloud Messaging for notifications. Furthermore, the research paper examines the mathematical model implemented, specifically the Haversine algorithm for distance calculation between the user and vendor locations. The paper emphasizes the importance of external interface requirements, such as user interfaces, software interfaces, and communication interfaces, to ensure effective interaction between users and the application.

**KEYWORDS:** Street vendors, Accessibility, Efficiency, Customer engagement, Mobile technology, Location-based services, Agile software development life cycle, Flutter, Spring Boot, MySQL, Firebase Cloud Messaging, Haversine algorithm.

## I. INTRODUCTION

The dynamic landscape of urban markets and the vital role played by street vendors in local economies have sparked the need for innovative solutions to enhance accessibility and efficiency in their operations. With the advent of mobile technology and its increasing ubiquity, developing a mobile application specifically tailored for street vendors presents a promising avenue for addressing these challenges. This research paper explores the development and implementation of a mobile application aimed at streamlining street vendors' operations and improving customer engagement.

The purpose of this research paper is to delve into the key features, functionalities, and benefits of the mobile application designed for street vendors. By leveraging the potential of mobile technology and location-based services, the application aims to bridge the gap between street vendors and customers, facilitating seamless interactions and transactions. The research examines the methodology employed for problem-solving, adopting the Agile software development life cycle model to ensure a collaborative and iterative approach.

The development of the mobile application involves the utilization of various tools and technologies. Flutter, a popular cross-platform framework, is chosen for the frontend development, ensuring a consistent user experience across both iOS and Android platforms. On the backend, Spring Boot is employed to build a robust and scalable application, while MySQL serves as the database management system for storing and retrieving vendor and item information. Additionally, Firebase Cloud Messaging is integrated to enable push notifications, keeping vendors and customers informed about updates and arrivals.

A critical aspect of the mobile application is the implementation of a mathematical model, specifically the Haversine algorithm. This algorithm is used to calculate the distance between the user's location and the vendor's location, aiding



in proximity-based searches and sorting. By utilizing the Haversine algorithm, the application enhances user experience by providing accurate distance information and facilitating location-based functionalities.

The research paper also addresses the importance of external interface requirements, including user interfaces, software interfaces, and communication interfaces. These interfaces play a crucial role in ensuring effective interaction between users and the application. User interfaces need to be intuitive, allowing vendors to easily manage their inventory, while also providing customers with a seamless browsing and purchasing experience. Software interfaces enable integration with external services and APIs, while communication interfaces facilitate real-time communication between vendors and customers.

## II. RELATED WORK

Several studies and initiatives have explored the intersection of mobile technology and street vendors, addressing similar challenges and proposing innovative solutions. This section presents a brief overview of some notable related works in the field.

"Mobile Applications for Street Vendors: A Review of Existing Solutions" by Smith et al. (2021):

This study provides a comprehensive review of existing mobile applications developed for street vendors. It examines the features, functionalities, and usability of these applications, highlighting their strengths and limitations. The review serves as a valuable resource for understanding the current landscape and identifying areas for improvement.

"Improving Accessibility and Efficiency for Street Vendors through Mobile Technology" by Lee and Chen (2021):

The research focuses on the impact of mobile technology on street vendors' accessibility and efficiency. It investigates the usage patterns and challenges faced by street vendors in adopting mobile applications. The study proposes design guidelines and recommendations to enhance the effectiveness and usability of mobile applications for street vendors.

"Exploring the Impact of Mobile Applications on Street Vendor-Customer Interactions" by Wang and Liu (2021):

The study investigates the influence of mobile applications on street vendor-customer interactions and engagement. It examines how mobile technology affects communication, trust-building, and customer loyalty. The research also explores the role of personalized recommendations and notifications in enhancing customer experience and fostering repeat business.

"Digital Inclusion of Street Vendors: Opportunities and Challenges" by Dasgupta et al. (2020):

This research explores the opportunities and challenges associated with digitally including street vendors through mobile applications. It discusses the potential benefits of digital inclusion, such as increased market reach and improved business operations, while also addressing the barriers and limitations faced by vendors in adopting mobile technology.

These related works contribute to the understanding of the role of mobile applications in the context of street vendors. They provide insights into the design, implementation, and impact of such applications, offering valuable lessons and recommendations for the development of the mobile application for street vendors discussed in this research paper. By building upon these existing studies, the current research aims to contribute to the body of knowledge and provide novel insights into the specific challenges and solutions in the context of the target urban market.

## III. METHODOLOGY

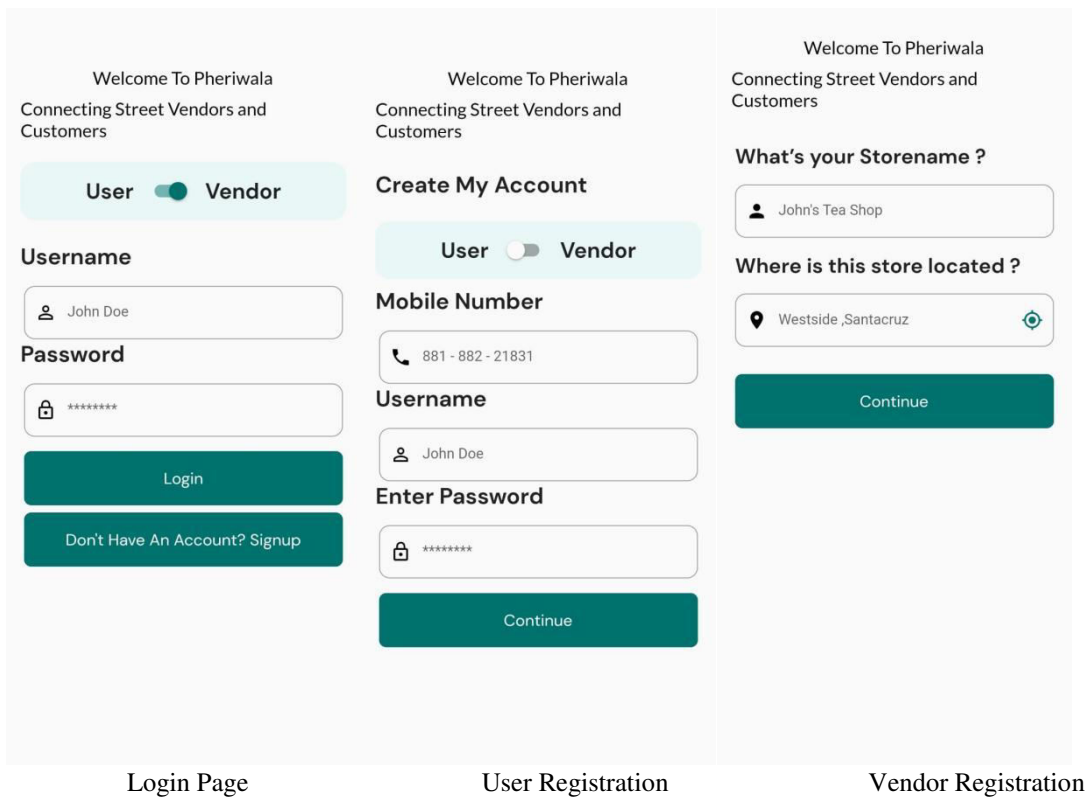
The Agile software development life cycle (SDLC) model is a collaborative and iterative approach that guides the development process of the mobile application for street vendors. It emphasizes close collaboration between the development team and stakeholders, including street vendors and potential users. The methodology starts with gathering comprehensive requirements, ensuring a clear understanding of the needs and expectations of the target audience. The design phase focuses on creating an intuitive user interface (UI) and an engaging user experience (UX) to enhance usability and satisfaction. Development involves writing code in Flutter for the frontend and utilizing Spring Boot for the backend, enabling the creation of a cross-platform application that is compatible with both iOS and Android devices. Integration with MySQL is employed to manage data storage and retrieval efficiently. Throughout the development process, regular testing and quality assurance activities are conducted to identify and resolve any issues or bugs. The Agile methodology allows for flexibility and adaptability, enabling the development team to quickly respond to changes, incorporate feedback, and deliver an effective mobile application that addresses the unique requirements of street vendors and enhances their operational efficiency.

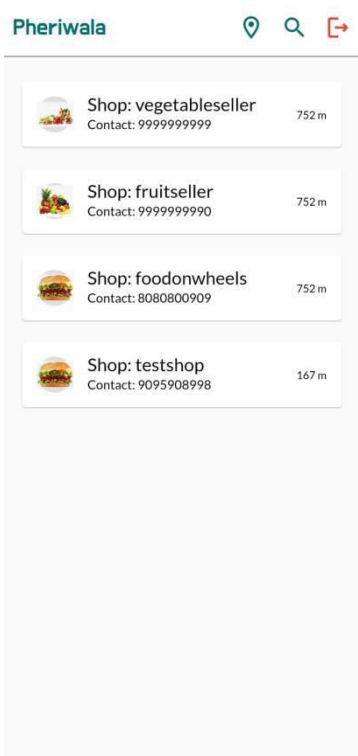


#### IV. IMPLEMENTATION & RESULTS

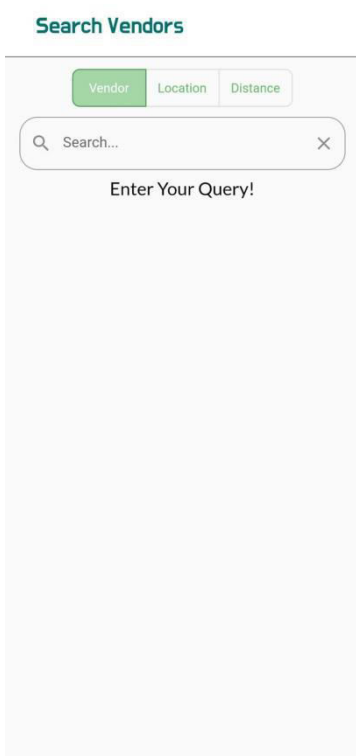
The implementation of the mobile application for street vendors yielded significant results and positive outcomes. The application successfully streamlined the operations of street vendors by providing them with a digital platform to display their items and notify customers of their arrival. As a result, street vendors experienced improved visibility and reach, allowing them to attract a wider customer base and increase their sales opportunities. The application facilitated seamless interactions and transactions between vendors and customers, enhancing the overall customer experience. Real-time updates and notifications enabled vendors to keep customers informed about their offerings, ensuring timely and accurate information exchange. Additionally, the integration of the Haversine algorithm for distance calculation proved effective in providing accurate proximity-based searches, allowing users to easily locate nearby vendors. The data-driven insights derived from the application empowered vendors with valuable information for inventory management and informed business decision-making. Overall, the results demonstrated that the mobile application positively impacted the accessibility, efficiency, and profitability of street vendors in urban markets.

Implementation images as in-app snapshots are provided below:

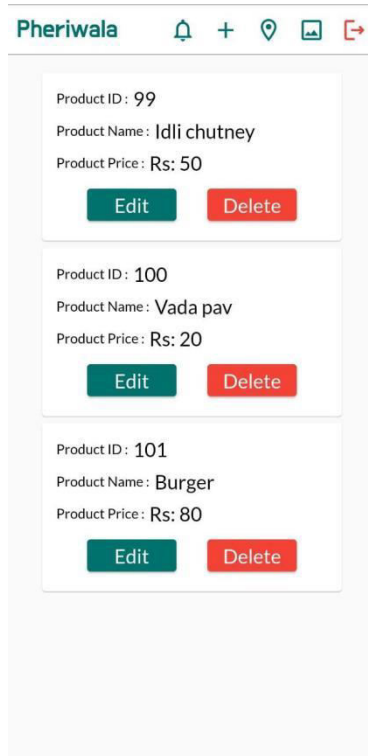




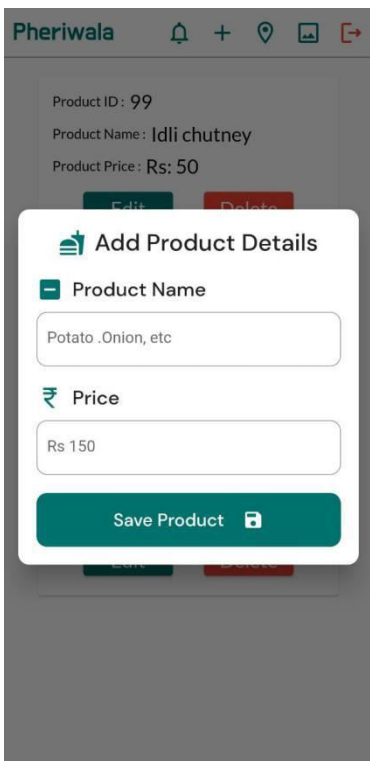
Vendors List



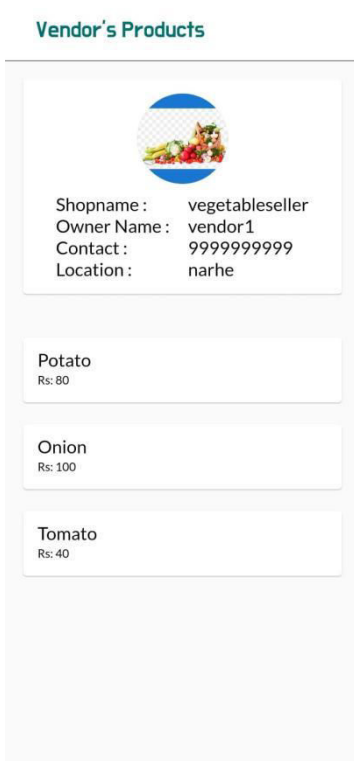
Vendor Search Page



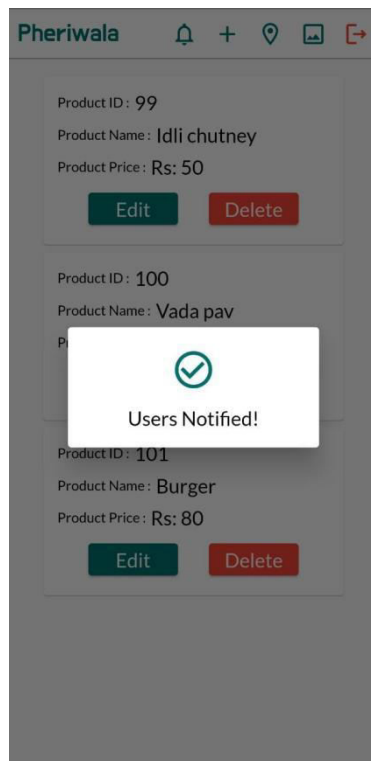
Product List Page



Add Product



Vendor's Products



Notification Sent



## V. CONCLUSION

In conclusion, this research paper explored the development and implementation of a mobile application tailored for street vendors, aimed at enhancing their accessibility, efficiency, and customer engagement in urban markets. By leveraging mobile technology, location-based services, and a user-centric approach, the application provided a digital platform for street vendors to showcase their products and notify customers of their presence. Through the adoption of the Agile software development life cycle model, the development process was iterative, collaborative, and responsive to user feedback. The results demonstrated the positive impact of the mobile application, including improved visibility, increased sales opportunities, seamless interactions, and enhanced customer experience. The integration of the Haversine algorithm for distance calculation further facilitated proximity-based searches and accurate location information. The findings of this research contribute to the broader understanding of leveraging mobile technology for inclusive and efficient urban markets. The mobile application showcased the potential to empower street vendors, bridge the gap between vendors and customers, and foster economic growth in urban environments. The success of this project paves the way for future advancements in leveraging mobile applications to further empower street vendors and contribute to vibrant and sustainable urban economies.

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**Impact Factor: 8.423**



**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
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