Enhancing Blue Collar Jobs - Development of a Location-Based Mobile Job Portal for Repair Services

Srinivas Makkena
Computer Science
Midwestern State University
Wichita Falls, TX, USA
smakkena1015@my.msutexas.edu

Gowtham Reddy Mallu
Computer science
Midwestern State University
Wichita Falls, TX, USA
gmallu1214@my.msutexas.edu

Naveen Kumar Poka
Computer science
Midwestern State University
Wichita Falls, TX, USA
npoka0828@my.msutexas.edu

***Abstract*—The need for efficient repair services is paramount in today's tech-driven society. QuickLocalFix Repair Services addresses this need by offering a streamlined platform connecting individuals with skilled repair professionals, thus ensuring prompt and reliable solutions to repair needs. This presentation will underscore the critical role of QuickLocalFix in enhancing accessibility to quality repair services. We will delve into the platform's innovative features, including its user-friendly interface, transparency, services in remote areas, and real-time communication tools, demonstrating how QuickLocalFix revolutionizes the repair service industry.**

***Index Terms*—Blue Collar Jobs, Mobile Job Portal, Location-Based Services, Repair Services, Workforce Development, Job Matching**

I. Introduction

QuickLocalFix Repair Services is a centralized platform designed to connect individuals in need of repair services with skilled professionals. Traditional repair services often face challenges such as lack of transparency, inaccessibility in remote areas, and high costs due to limited information about repairs. QuickLocalFix addresses these issues by providing an intuitive and user-friendly interface that enables seamless communication between customers and professionals.

The platform allows users to book services, schedule inspections, order parts, and track the progress of repairs. Unique features such as real-time chat and transparent pricing create a more informed and satisfying customer experience.

The platform is being developed to explore how a user-friendly digital solution can make repair services more accessible, transparent, and efficient, especially in remote and underserved areas, while building trust and fairness between users and professionals.

II. Literature Review

One study addresses the challenges faced by blue-collar workers in Nigeria due to limited job opportunities. It proposes a location-based mobile platform to connect workers with local employers, aiming to bridge the gap between workers and job opportunities, thus promoting economic empowerment and reducing unemployment [1]. The researchers developed this platform using React Native for mobile application development and Firebase for real-time database management, ensuring accessibility for users in various locations. Unlike this platform, our application focuses on connecting users with service professionals rather than job seekers and employers. Another paper emphasizes the importance of providing clear information about job roles, wages, and worker qualifications to build transparency and trust. It highlights features such as a 'Post Job' module and a review system that helps both job seekers and employers make informed decisions [2].

The authors utilized HTML, CSS, and JavaScript for front-end development, alongside Node.js for the backend, creating an intuitive user interface that simplifies the job posting and application process. A third study focuses on using web technologies to connect under-skilled workers with employment opportunities. It explains how such platforms allow workers to manage their profiles, set rates, and communicate directly with potential employers [3]. The platform was developed using PHP and MySQL, enabling effective management of user data and facilitating real-time interactions to enhance the user experience.

Lastly, one study describes how modern technologies like Django and machine learning can be used to manage employee data and payroll, outlining features such as payroll management, task tracking, and attendance records [4]. The researchers implemented Python with Django for the backend and utilized PostgreSQL for their database system to handle large amounts of employee data efficiently. Though our application also uses Django, the focus is on facilitating interactions between customers and professionals, including service requests, payments, and real-time communication, rather than employee management. Overall, QuickLocalFix incorporates many of the key ideas from these studies, creating a userfriendly platform that connects customers with skilled professionals while focusing on trust, transparency, and efficient service delivery.

III. Methodology

This project adopted a mixed-methods (both quantitative and qualitative) approach to guide the design, development, and testing of the QuickLocalFix platform, focusing on both technical and user-centered challenges.

A. Data Collection (3 weeks)

We analyzed existing systems such as UrbanClap [5], TaskRabbit [6], Angie's List [7], and existing literature to understand the needs of both customers and professionals. This analysis helped identify key challenges, including trust in service providers and accessibility to remote areas, as well as preferences for essential platform features like real-time chat, price comparison, and dynamic user dashboards.

B. Requirements Gathering (3 weeks)

This stage involved consolidating findings from the literature and analyzing existing systems [5]–[7], which led to the development of detailed technical specifications and a roadmap for implementation [2]. Class models 2 were also created to represent both customers and professionals, encapsulating the necessary functionalities and data attributes for effective interactions within the platform.

C. Iterative Development (6 weeks)

The backend was built using Django [4], with PostgreSQL for data management. Core features implemented included service matching, real-time chat, and access to customer carts by professionals. The frontend was developed with React.js for a responsive UI. Agile development practices allowed for rapid prototyping and continuous feedback, reducing development risks. Django was chosen for the backend due to its robust handling of complex logic and scalability, while React.js provided the flexibility required for a responsive and engaging frontend.

D. Technical Challenges and Resolutions (2 weeks)

Third-Party API Integration: One major challenge involved building APIs to pull products from third-party eCommerce platforms like ebay and bestbuy to allow users to purchase repair-related products. This led us to implement a custom module for API request handling and product management in the database to optimize performance.

Real-Time Chat and Dynamic UI: Implementing real-time chat features using Django Channels addressed challenges with updating chat interactions on the frontend. Django Channels facilitated asynchronous communication between users and professionals, allowing multiple active sessions to be managed effectively.

Accessing User Carts by Professionals: Enabling professionals to view customer carts and manage orders in real-time posed a logical challenge. Traditional Django models were insufficient for dynamically managing cart contents across user roles. The backend needed to handle multiple types of requests simultaneously while ensuring that professionals could only access their customers' carts related to pending services.

E. Testing and Deployment (2 weeks)

The final step involved testing the system to assess functionality and performance. After thorough testing, the application was deployed on Netlify for the frontend and PythonAnywhere for the backend.
QuickLocalFix operates through three primary roles:

- **Customers**: Users seeking repair services, who can book services, schedule appointments, track repair status, and rate professionals.
- **Repair Professionals**: Service providers who accept requests, provide repairs, manage service statuses, and receive feedback.
- **Admin**: Platform administrators who manage user and professional data, approve changes, and ensure smooth system operation.

The development follows an iterative approach spanning 16-20 weeks, with each phase focusing on the implementation and refinement of specific features.

IV. Results & Discussions

The QuickLocalFix platform demonstrates an efficient and user-centered solution for connecting customers with repair professionals. Core features such as transparent pricing, real-time communication, and a responsive user interface simplify booking appointments, and service tracking processes, addressing common issues in traditional repair services. The platform's structure supports accessibility across various regions, including remote areas, with a fair fee structure for professionals.

- **Transparent Pricing and Communication**: QuickLocalFix offers a clear pricing model and integrates real-time communication tools, allowing users to communicate directly with professionals. This transparency raise trust and enhances the service experience by enabling users to make informed decisions. Additionally, both users and professionals have shared access to the same cart, which can be updated by either party, facilitating a seamless and collaborative service experience.
- **Intuitive User Interface**: Built using React.js for frontend responsiveness and Django for backend efficiency, QuickLocalFix offers a streamlined user interface that supports service selection, booking, tracking, and customer-professional communication, resulting in a smooth user experience.

The Block Diagram shown in fig 1 illustrates the high-level architecture, outlining how various components interact within the platform. The Class Diagram shown in fig 2 offers a detailed view of the system's data structure, highlighting the relationships between different classes and objects.

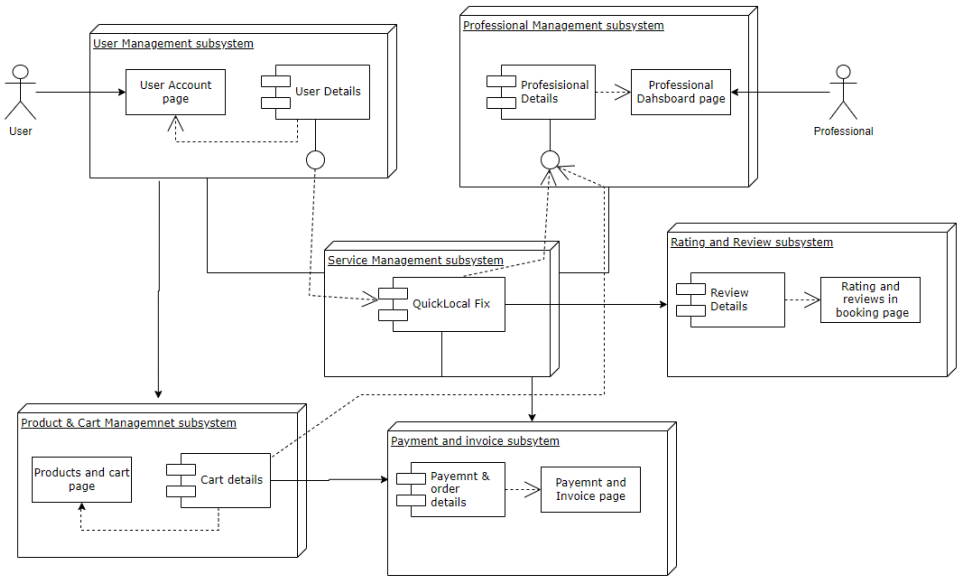


Fig. 1. Block Diagram.

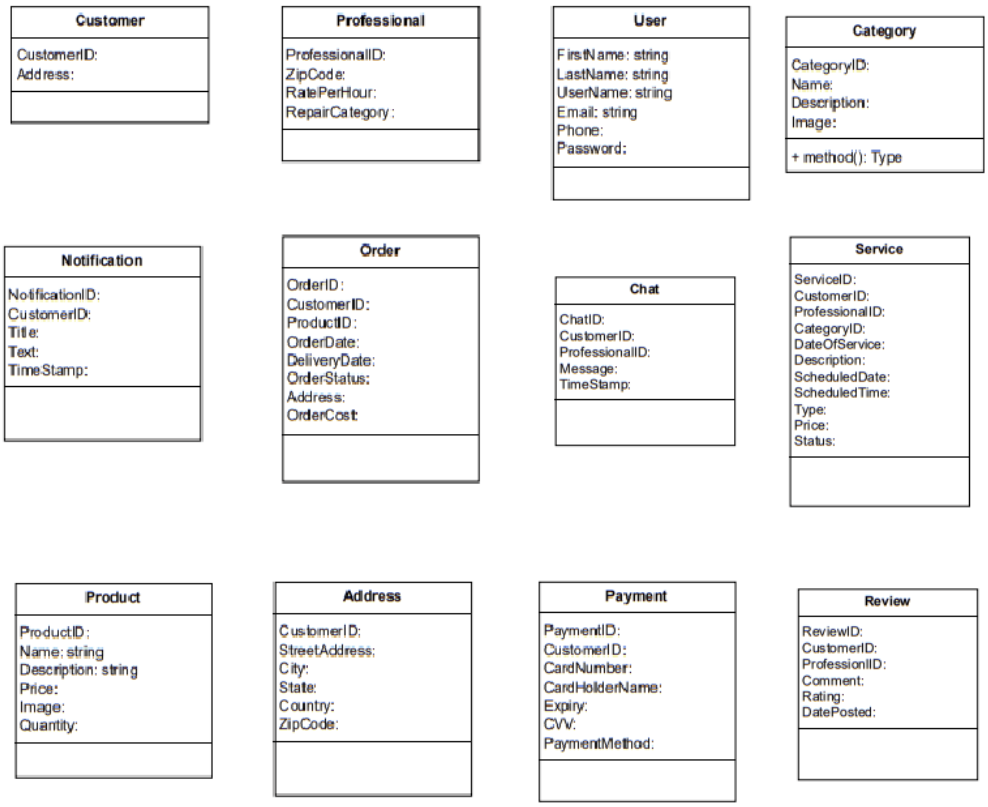


Fig. 2. Class Diagrams.

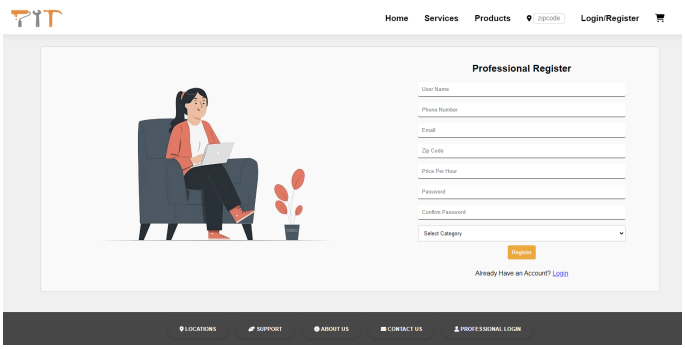


Fig. 3. UI Screenshot 1 - Registering New User

The User Registration Page, shown in Figure 3, provides a simple and easy way for new users to sign up. It collects the necessary information to create their profiles.

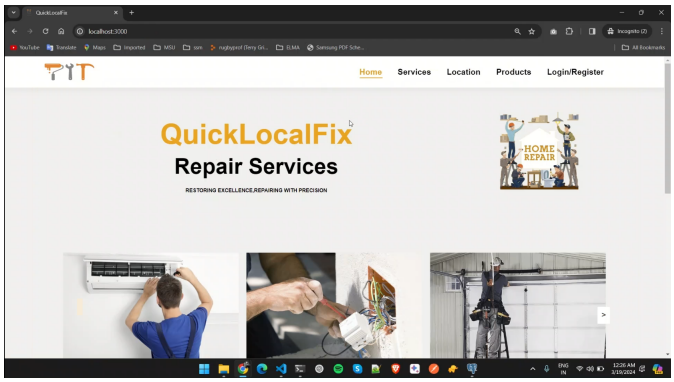


Fig. 4. UI Screenshot 2 - Home Page

The Home Page, shown in Figure 4, is the main screen where users can quickly access features like booking services, ordering products and account details from the Navigation menu at top. It is designed to be straightforward and easy to use.

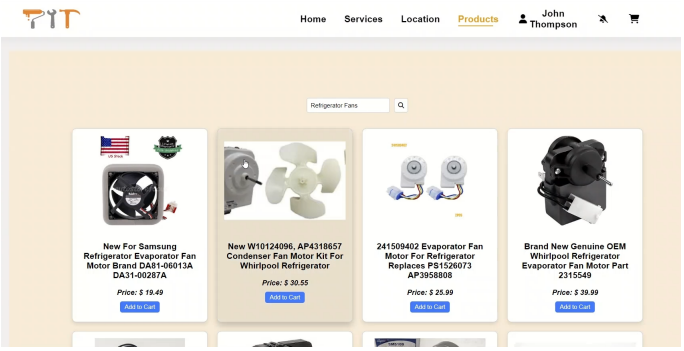


Fig. 5. UI Screenshot 3 - Ecommerce Page

The E-commerce Page, shown in Figure 5, lets users browse and buy repair-related parts and materials. It includes detailed product listings and secure payment options to make the experience smooth and reliable.

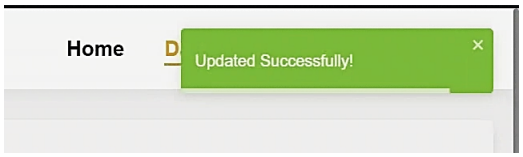


Fig. 6. UI Screenshot 4 - Toastify Alerts

When users update or change something, they receive alerts like the ones shown in Figure 6.

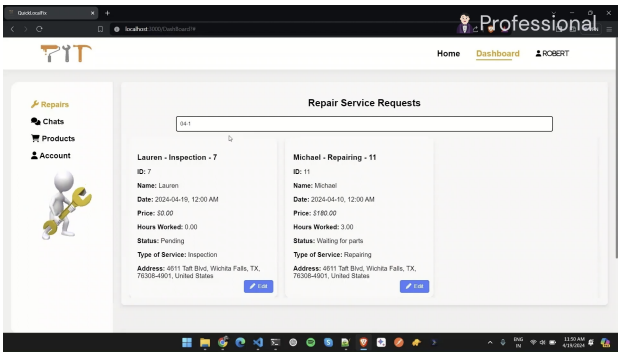


Fig. 7. UI Screenshot 5 - Service Requests Received

Figure 7 shows the professional's dashboard, where they can view all the service requests they have received. It also includes a filter feature that allows them to search for requests based on date, name, or request type.

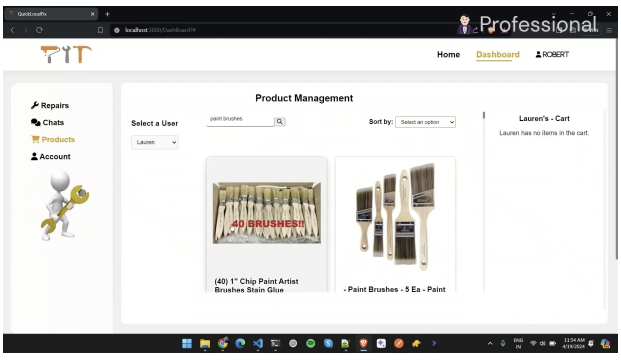


Fig. 8. UI Screenshot 5 - Users Cart Accessed by professional

As shown in Figure 8, professionals can access the user's cart while the service request is still active. They can also add items that the user needs to buy for the service.

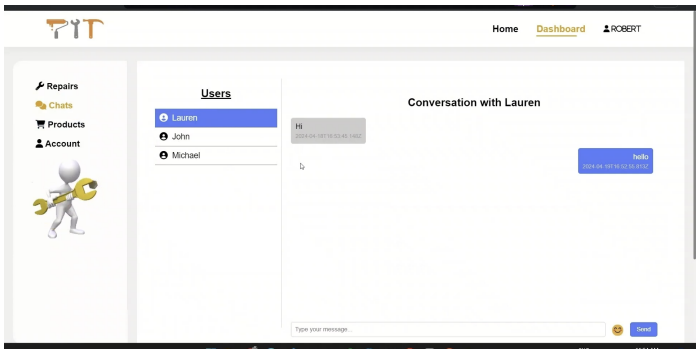
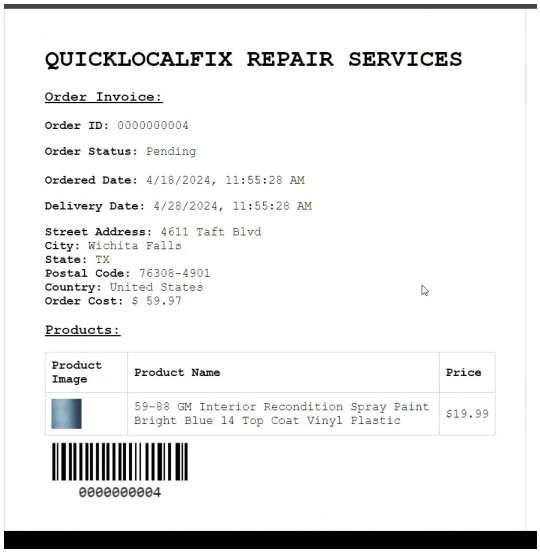


Fig. 9. UI Screenshot 6 - Chat

Figure 9 illustrates the chat feature, which allows users and professionals to communicate directly and avoid misunderstandings.



QUICKLOCALFIX REPAIR SERVICES

Order Invoice:

Order ID: 0000000004

Order Status: Pending

Ordered Date: 4/18/2024, 11:55:28 AM

Delivery Date: 4/28/2024, 11:55:28 AM

Street Address: 4611 Taft Blvd
City: Wichita Falls
State: TX
Postal Code: 76308-4901
Country: United States
Order Cost: $ 59.97

Products:

Product Image	Product Name	Price
	59-88 GM Interior Recondition Spray Paint Bright Blue 14 Top Coat Vinyl Plastic	$19.99

0000000004

Fig. 10. UI Screenshot 7 - Invoice

Figure 10 shows the invoice screen, where users can view the details of their payments and charges for completed services.

A user feedback survey was conducted to gather insights about the platform experience. The main findings from the feedback are as follows:

- **Profile Management:** Users found the ability to create both client and provider profiles helpful but confusing, as the tasks were dispersed across different sections. They preferred a unified and organized interface for managing profiles.
- **Search and Filter Functionality:** The platform's price transparency and search options were appreciated. However, users noted that providers should have the ability to manually input essential tools or supplies acquired from offline sources. This would address reliance on provider honesty and improve job preparation.
- **Rural Accessibility:** Users in rural areas expressed willingness to adopt the platform if there were a sufficient number of active users. They also suggested expanding the search to include non-platform users and providing mechanisms to encourage them to join.
- **Chat Feature:** While not fully tested, users valued the potential of the chat feature for preventing miscommunication and maintaining written records of agreements. Customization and Outreach: Users recommended additional customization for supply listings and enhanced features to attract and onboard more clients and professionals.

V. Conclusion

QuickLocalFix Repair Services effectively bridges the gap between customers and skilled repair professionals, particularly in underserved regions. Through its transparent and accessible design, the platform addresses issues of trust and reliability in repair services. By providing features such as clear pricing, a vetted professional network, and streamlined communication, QuickLocalFix supports a trustworthy and comprehensive service experience. This approach underscores the platform's potential to be a valuable tool in the repair services market, especially for users in remote areas who may lack access to reliable repair solutions.

VI. Limitations & Future Work

To enhance the capabilities of QuickLocalFix, future developments may include:

- **Machine Learning Integration:** Implement predictive analytics to estimate repair costs based on historical data, offering users an informed cost overview before booking.
- **Enhanced Mapping for Rural Areas:** Automatically map customers in rural or underserved areas to nearby service locations. This feature would provide price predictions for travel-based services, enhancing accessibility and cost transparency.
- **Enhanced Security Measures:** Strengthen data privacy through advanced encryption techniques for communication and user data storage, enhancing overall security.

By addressing these limitations and integrating innovative features, QuickLocalFix aims to set new benchmarks in the repair service industry, promoting accessibility, transparency, and user satisfaction.

References

[1] Aligbe, A., Ojo, J. A., & Ikwue, M. U. (2021). Development and Implementation of Location-Based Mobile Job Portal for Blue-Collar Jobs in Nigeria. *IOP Conference Series: Materials Science and Engineering*, 1107, 012098. https://doi.org/10.1088/1757-899X/1107/1/012098

[2] Biradar, P., Dukare, V., & Fegade, S. (2021). Job Portal for Blue Collar Professionals. G H Raisoni College of Engineering and Management, Pune, India.

[3] Gowdham, K. V., Rajesh, R., Selvan, S. A., & Chandru, S. (2024). Harnessing Web Technologies for Empowering the Underskilled Workforce. *International Research Journal of Modernization in Engineering Technology and Science*, 6(6), 1–10. https://doi.org/10.56726/IRJMETS52234

[4] Bhange, S., Jadhav, U., Jaipurkar, D., Raut, T., & Panchbhai, V. (2021). Employee Information and Payroll System Using Python, Django & Machine Learning. *International Research Journal of Engineering and Technology (IRJET)*, 8(5), 2872–2875. https://www.irjet.net/archives/V8/i5/IRJET-V8I5339.pdf

[5] N. Jyani and H. Bansal, "UrbanClap: India's largest home service provider," *Asian Journal of Management Cases*, vol. 20, no. 2, pp. 94-105, 2023.

[6] TaskRabbit. [Online]. Available: https://www.taskrabbit.com/. [Accessed: Oct. 23, 2024].

[7] Angie's List. [Online]. Available: https://www.angieslist.com/. [Accessed: Oct. 23, 2024].