

METHODOLOGY - CMPS-6903-101 Research Methods in Comp Science

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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.

1. Literature Review and Planning

The study started with literature review to explore best practices in job-matching platforms and service-based applications. Studies like Development and Implementation of Location-Based Mobile Job Portal for Blue-Collar Jobs in Nigeria [1] and Harnessing Web Technologies for Empowering the Underskilled Workforce [3] provided insights into bridging accessibility gaps and optimizing location-based job discovery. Additionally, Bhange et al.'s work on Django-based systems [4] guided technical decisions regarding backend scalability and secure data handling.

2. Data Collection

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.

3. Development and Technical Challenges

3.1 Requirements Gathering (3 weeks) – This stage involved consolidating findings from the literature and analyzing existing systems [5][6][7], which led to the development of detailed technical specifications and a roadmap for implementation [2]. Class models were also created to represent both customers and professionals, encapsulating the necessary functionalities and data attributes for effective interactions within the platform.

3.2 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.)

3.3 Technical Challenges and Resolutions (2 weeks)

3.3.1 Third-Party API Integration:

One major challenge involved building APIs to pull products from third-party eCommerce platforms to allow users to purchase repair-related products. This made us to implement custom module for API request handling and product management in database to optimize performance.

3.3.2 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.

3.3.3 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.

3.4 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.

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 Work-force. International Research Journal of Modernization in Engineering Technology and Science, 6(6), 1–10. <https://doi.org/10.56726/IRJMET52234>
- [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].