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Quick-Fix AI Powered Home Maintenance And Repair Service

Mohammed Arshad Hussain, M. Charanya, M.Niharika Yadav, Y.Nikhitha Reddy
[1] Assistant Professor, Department of CSE, Bhoj Reddy Engineering College for Women, India.
[2,3,4]B. Tech Students, Department of CSE, Bhoj Reddy Engineering College for Women, India.

ABSTRACT

QuickFix is an AI-powered home maintenance platform designed to simplify and enhance the process of diagnosing and resolving household issues. The system offers users two core functionalities: intelligent self-diagnosis through an AI chatbot and seamless booking of verified technicians.The chatbot, equipped with smart image recognition (via Google Vision API) and natural language processing, allows users to describe their problems using text or upload images. It responds with 2–3 DIY troubleshooting steps using text, images, and videos. If the issue remains unresolved, the system intelligently suggests suitable technicians based on service type, user location, ratings, and availability.QuickFix supports three roles: users, technicians, and admins. Users can register, log in, consult the chatbot, and book services. Technicians can register by specifying their expertise and manage their service dashboard. Admins can view user activities, bookings, and contact messages through a dedicated dashboard.By combining AI-based troubleshooting with technician mapping and booking, QuickFix aims to offer a faster, smarter, and more efficient home maintenance experience.

1. INTRODUCTION

Quick Fix is an AI-powered home maintenance platform that connects users with verified technicians for seamless and secure service bookings. It features an AI chatbot for DIY fixes, instant booking and scheduling, real-time price estimates, and Google Maps integration to locate nearby service providers,with transparent pricing, user reviews, and data security. Quick Fix ensures a reliable, efficient, and hassle-free home repair experience for homeowners and tenant

The Knockman App is a home maintenance service platform that connects users with professional technicians for various repair and maintenance tasks such as plumbing, electrical work, carpentry, and appliance repairs.It provides a marketplace-based approach, allowing users to book service providers based on availability, ratings, and pricing. QuickFix modernizes home maintenance with AI and smart automation. It features an AI chatbot for issue diagnosis and DIY fixes, connecting users to verified technicians via Google Maps API when needed. Focused on efficiency and reliability, QuickFix simplifies home repairs, making it a one-stop solution.

2. REQUIREMENTS ANALYSIS

Functional Requirements

- Users, technicians, and admins can register and log in with role-based access.
- Users can describe problems via text/image, and the chatbot provides DIY troubleshooting steps.
- Users can auto-book nearby technicians based on service type and location.
- Users get estimated costs before booking and can track technician status live.
- Technicians can manage job requests, update status, and maintain their profiles.
- Admins can monitor users, bookings, contact messages, and oversee system activities.

Non-Functional Requirements

- Performance: The system should respond to user actions (like chatbot replies or technician search) within 2–3 seconds for a smooth experience.
- Scalability: The system should be capable of handling an increasing amount of data and multiple concurrent users.
- Security: All data transmissions must be encrypted; user access shouldbe authenticated and authorized.
- Usability: The user interface should be intuitive and responsive on both desktop and mobile devices.
- Reliability: The system should have a high availability rate (>99%) with fault tolerance mechanisms in place.

3. DESIGN

ARCHITECTURES

SOFTWARE ARCHITECTURE

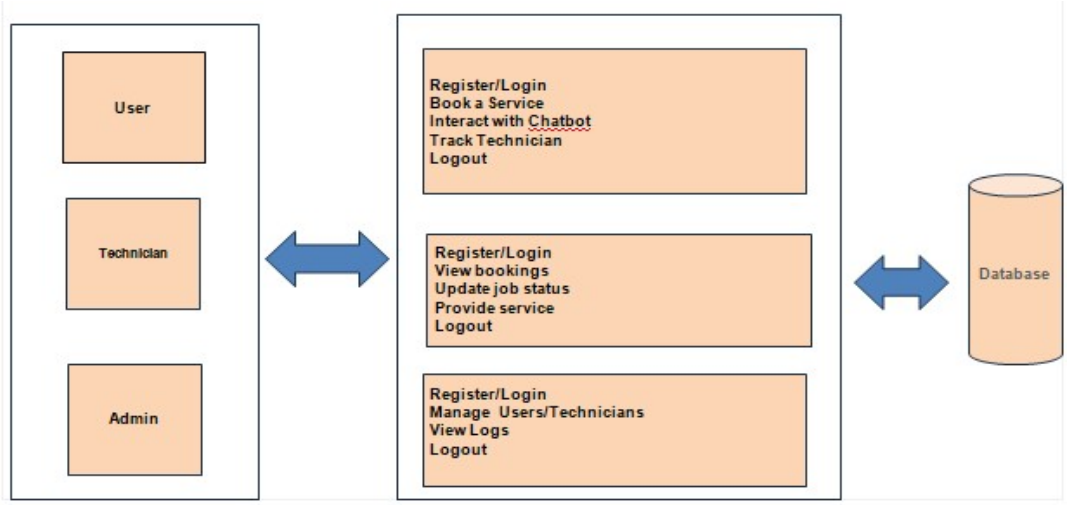


Fig: Software Architecture

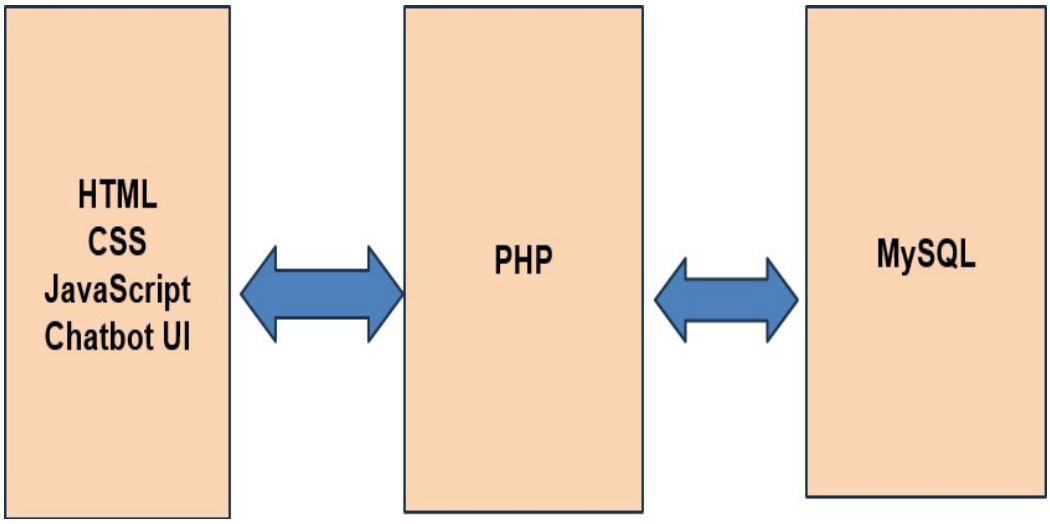
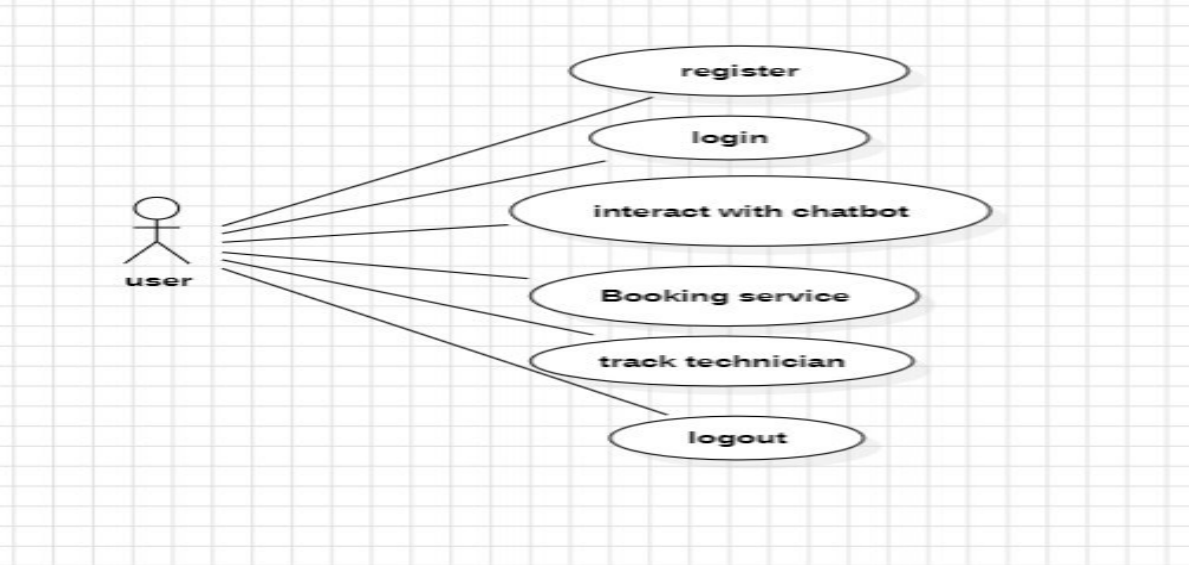


Fig: Technical Architecture

USE CASE DIAGRAM

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.



4. IMPLEMENTATION

The QuickFix system is designed to provide efficient, AI-assisted home maintenance and repair services. The platform combines smart scheduling, real-time technician search, and AI chatbot diagnostics to improve service speed and quality. The system implementation includes several key stages:

User Interface

A responsive and intuitive user interface is developed using HTML, CSS, and JavaScript for frontend and PHP for backend logic. The interface supports:

- User Login/Signup with secure authentication.
- Dashboard for booking services, tracking order status, and accessing chat support.
- Admin Panel for managing service listings, technician data, and user issues.

Service Booking and Scheduling

Users can browse various home repair categories (plumbing, electrical, etc.) and select services. Features include:

- Instant Booking: Users choose service type, preferred time, and address.
- Calendar Scheduling: Integration with real-time calendar to check technician availability.
- Confirmation Notifications: Automated emails/SMS confirm and remind users of bookings.

AI Chatbot Diagnostic Engine

A conversational AI chatbot is implemented to offer DIY troubleshooting and understand repair needs:

- Built using Natural Language Processing (NLP) techniques and trained with common repair issue datasets.
- Supports text, image, and voice inputs to analyze

user-reported problems.

- Suggests DIY repair steps or escalates to technician booking based on issue complexity.

5-SCREENSHOTS

HOME PAGE :

REGISTER PAGE:

SERVICE PAGE:

6-CONCLUSION

The QuickFix platform successfully demonstrates how artificial intelligence and modern software technologies can revolutionize home maintenance and service delivery. By integrating AI-powered chat capabilities, an intuitive service booking system, real-time technician management, and robust backend operations, QuickFix provides a seamless and intelligent user experience for both homeowners and service providers.

The system's chatbot, powered by NLP, enables natural, conversational interactions that simplify service requests and enhance customer engagement. Automated scheduling, technician assignment, and service tracking contribute to operational efficiency and reduce manual effort. Security and performance measures ensure user trust and platform reliability under varying loads and scenarios.

Extensive testing—including functionality, usability, performance, and security—validated that the system meets the requirements for real-world deployment. QuickFix not only streamlines the home service process but also sets the foundation for scalable, AI-enhanced solutions in the property maintenance industry.

Moving forward, the platform can be further enhanced with predictive maintenance features, integration with IoT devices, multilingual chatbot support, and advanced analytics for service optimization.

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