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Fixora: Artificial Intelligence-Powered Platform for Seamless Home Maintenance

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Abstract: In today's fast-paced world, the need for trustworthy home maintenance services in plumbing, electrical work, and carpentry is growing at an incredible rate. But when people have to coordinate between customers and service people, it usually leads to schedule conflicts, delays in services, or changes in quality. This project suggests an AI-powered digital platform that intelligently matches user requests with real service professionals based on their availability, location, and type of service. This will help solve these problems. In a full-stack framework approach, the system has customized dashboards for customers and service providers, enabling time management, smooth booking, and tracking of tasks and communications. Other features it offers with AI incorporation include secure user authentication, notifications about real-time status, and an admin control panel to monitor all activities. All of which combines AI with automation, enhancing efficiency, transparency, and reliability-ultimately yielding a more rewarding and reliable experience for all stakeholders in the home services ecosystem.

Keywords: *Artificial Intelligence (AI), Full-Stack Web Development, Real-Time Booking, Service Tracking, Role-Based Access, Secure Authentication.*

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I. INTRODUCTION

The rapid growth of digital technologies has increased the demand for efficient and dependable home maintenance services. However, most existing systems rely on manual coordination, resulting in service delays, scheduling conflicts, and inconsistent quality. These limitations emphasize the need for a smart, automated platform that connects customers with qualified professionals efficiently.

Fixora is an AI-powered online marketplace that modernizes the home maintenance process through intelligent automation. It enables customers to book services, track progress in real time, and communicate transparently with professionals. Using text and image-based issue recognition, Fixora identifies user problems and matches them with suitable service providers based on expertise, availability, and location.

The platform is developed using React, TypeScript, and Tailwind CSS for the frontend, with Spring Boot and MySQL powering the backend. AI enhances the system through smart recommendations, cost estimation, and continuous improvement via user feedback. Fixora also supports digital inclusion by empowering local workers and is designed for future expansion with mobile apps, multilingual support, and predictive maintenance.

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II. LITERATURE REVIEW

The rapid growths of digital service platforms and improvements in artificial intelligence have greatly impacted home maintenance systems. Early studies, like Effortless and Ready Service Provider for Home Fix [1], introduced AI and IoT-enabled repair scheduling systems. These made booking services easier but did not provide intelligent matching or real-time availability checks. Similarly, the Planning Process of HOMERESC [2] proposed a mobile-based service planning model that improved local service coordination. However, it lacked automated dispute resolution and feedback analysis. These shortcomings show the need for smarter, AI-driven platforms that can handle complex decisions and dynamic service allocation.

Further research, such as Fixify – Home Service App [3], focused on mobile apps for booking and rating service providers. However, their mobile-only design limited accessibility and growth. The Home Service Provider Project [4] explored real-time service management but had performance problems and relied on stable internet connectivity. These systems did not have strong automation, intelligent recommendations, or support for multiple platforms, making them less effective in various real-world situations.

Earlier web-based solutions, like ATOZ Doorstep Home Services [5], offered basic service listings but did not support dynamic recommendations, AI-driven issue recognition, or automated scheduling. All five studies showed common issues, including limited automation, lack of intelligent issue classification, absence of real-time provider matching, and minimal AI integration for decision support. Fixora addresses these gaps by combining Generative AI, full-stack web development, and automated workflows to create a unified, scalable, and intelligent home maintenance ecosystem.

III. PROBLEM STATEMENT

Homeowners face challenges in finding reliable service professionals due to manual coordination, unclear pricing, delayed responses, and inconsistent service quality. Existing platforms lack AI-driven automation, intelligent issue identification, real-time communication, and integrated service management. These gaps reduce efficiency, trust, and user satisfaction for both customers and service providers.

IV. OBJECTIVE OF THE STUDY

The main goal of this study is to create and launch a digital platform powered by AI. This platform will change the traditional home maintenance system by linking customers with reliable service providers. It aims to improve efficiency, transparency, and trust in service delivery through automation and smart decision-making.

➢ *General Objectives*

- Develop a unified AI-powered platform for booking and managing home maintenance services
- Automate issue recognition and service provider matching
- Ensure secure, scalable, and user-friendly access

➢ *Specific Objectives*

- Implement AI-based text and image issue recognition using ViT and MobileNet
- Match providers based on location, availability, ratings, and expertise
- Build a responsive full-stack system using React, Spring Boot, and MySQL
- Provide role-based dashboards for customers, providers, and administrators
- Enable real-time notifications, secure login, and transparent communication
- Design the system for scalability, multilingual support, and future expansion

V. PROBLEM STATEMENT

The proposed system, Fixora, is an AI-powered digital platform that automates and simplifies home maintenance services. It overcomes the drawbacks of current manual and semi-automated systems by combining smart issue recognition, provider matching, and real-time communication into a single, scalable setup.

A. System Overview

Fixora is a secure web-based platform that connects customers with verified service providers using AI and automation. Users submit service requests through text or images, which are analyzed by AI models to identify the service category and recommend suitable professionals. The platform ensures transparent pricing, real-time updates, and efficient service execution.

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B. System Architecture

The architecture follows a layered design:

➢ *Frontend Layer*
- Built with React, TypeScript, and Tailwind CSS.
- Provides responsive, interactive dashboards for customers and providers.

➢ *Backend Layer*
- Developed using Spring Boot.
- Manages business logic, booking workflows,and secure API communication.

➢ *Database Layer*
- MySQL relational schema with tables for users, services, bookings, and ratings.
- Maintains ACID compliance and referential integrity.

➢ *AI Service Layer*
- Vision Transformer (ViT) for image recognition through Hugging Face API.
- MobileNet serves as a fallback for offline/local inference.
- NLP models for text classification and issue categorization.

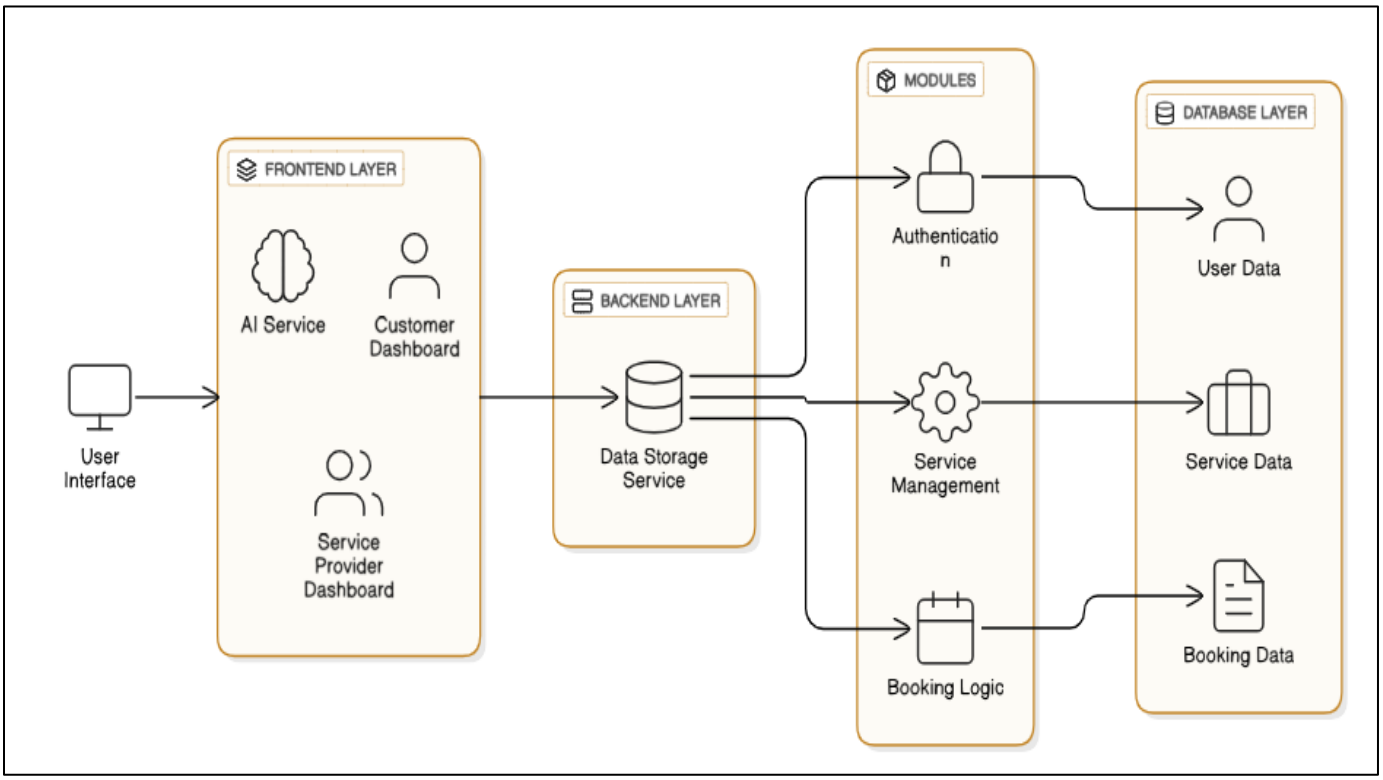

Fig 1: System Architecture for Fixora

C. Data Flow

- User Input: Customers submit service requests via text or images.
- AI Processing: Input is analyzed to identify the service category.
- Smart Matching: The system finds verified providers based on location, availability, and ratings.
- Booking Confirmation: User selects provider, and booking details are stored in the database.
- Service Execution: Providers update job status in real time.
- Feedback & Review: Customers rate services, and feedback helps improve future recommendations.
- Admin Oversight: Administrators monitor operations, prevent misuse, and guarantee service quality.

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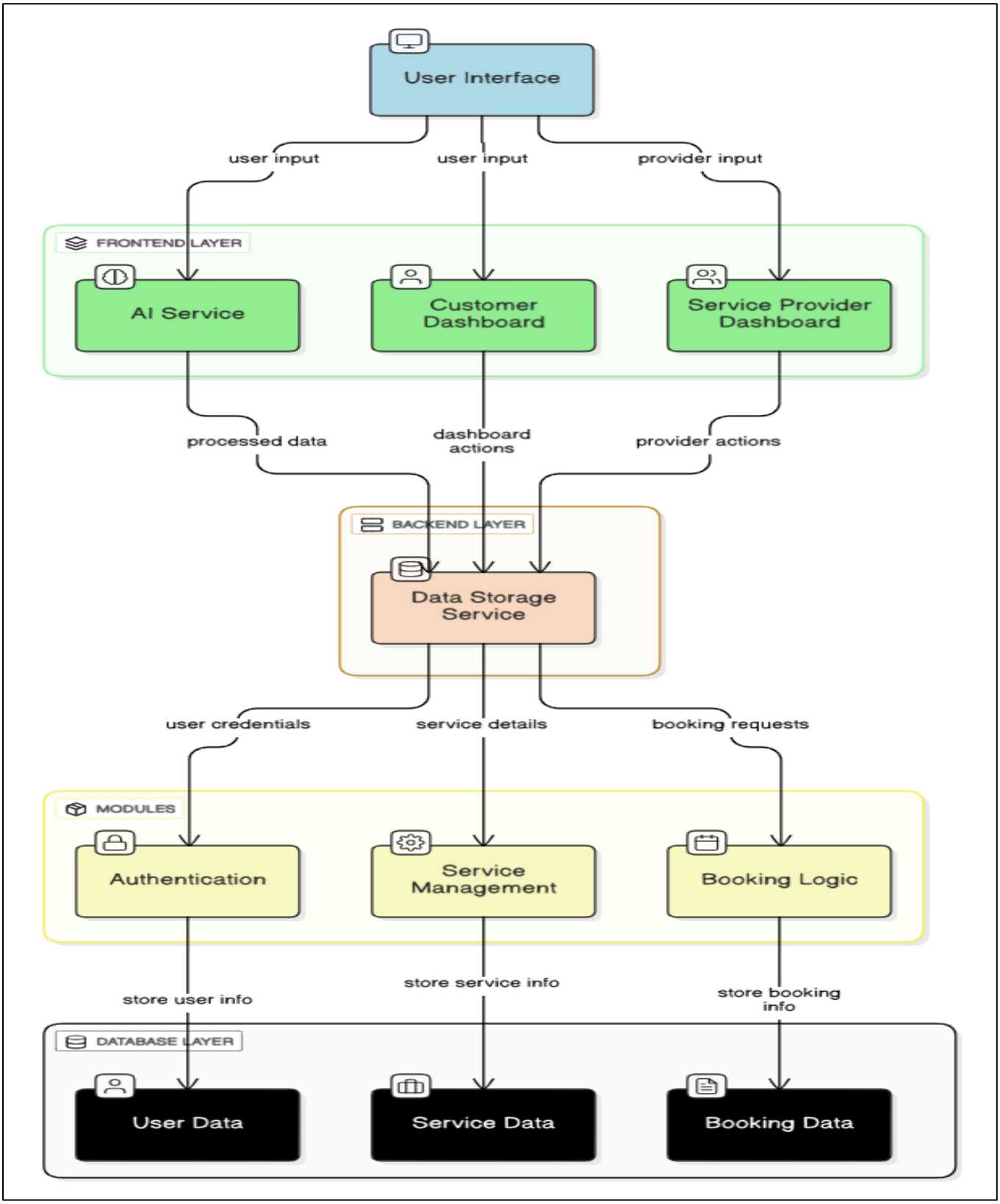

Fig 2: Data Flow of Fixora

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VI. IMPLEMENTATION

The implementation of Fixora takes a modular and phased approach, combining artificial intelligence with Full-stack web technologies. Each part was developed to ensure scalability, security, and smooth interaction between customers, service providers, and administrators.

The backend was built using Spring Boot, which provides secure and scalable REST APIs for booking, authentication, and provider matching. JWT authentication, BCrypt encryption, and Hibernate/JPA ensure secure sessions and efficient database operations. They also allow for real-time booking updates through asynchronous API calls.

The frontend was developed with React and TypeScript to create a dynamic and responsive interface. Tailwind CSS supports clean dashboard layouts for customers, service providers, and administrators. Axios facilitates secure communication with backend services. Each role-based dashboard lets users manage bookings, track progress, update profiles, and monitor system activity.

The database uses a MySQL relational schema, which includes tables for users, services, bookings, and feedback. Referential integrity, ACID compliance, indexing, and optimized queries ensure consistent and high-performance data handling, even under heavy load.

The AI module integrates Vision Transformer (ViT) through Hugging Face for image-based issue recognition and uses MobileNet as a fallback for low-network environments. NLP models process text and voice inputs, enabling accurate multi-modal classification. All AI outputs are linked to service categories to recommend suitable providers.

Testing included unit, integration, and user acceptance testing to check functionality, reliability, and usability. The system was deployed on a secure server environment, allowing for future mobile expansion. Overall, Fixora provides smooth booking, secure authentication, AI-driven issue recognition, real-time communication, and trusted service provider profiles.

VII. RESULTS AND ANALYSIS

The Fixora platform was successfully launched and assessed via functional testing, user acceptance testing, and performance checks. The results show that the system meets its goals of providing smart issue identification, smooth booking, and clear communication between customers and service providers.

A. System Outputs

During testing, the following modules were validated with real-time execution:

- Sign-Up and Authentication: Secure registration and login using JWT tokens and role-based access control.
- Customer Dashboard: Enabled service booking, interaction with the AI assistant, and live tracking of service requests.
- Service Provider Dashboard: Allowed providers to manage their jobs, update progress, and edit profiles.
- Admin Dashboard: Provided tools for monitoring accounts, service quality, and analytics.
- AI Assistant: Successfully identified issues from text and image inputs, sorting them into service categories like plumbing, electrical, carpentry, and appliance repair.
- Booking Workflow: Real-time booking confirmations and notifications were sent to both customers and providers.
- Feedback System: Customers rated completed services, and the ratings were stored to improve future suggestions.

B. Performance Evaluation

The system was tested under various conditions to check efficiency, accuracy, and reliability:

➢ *AI Recognition Accuracy:*

- Vision Transformer (ViT) achieved high accuracy in identifying service issues from images.
- MobileNet fallback provided decent predictions in offline or low-network situations.
- Text-based NLP classification matched service requests to categories accurately with few errors.

➢ *Scalability:*

- The system managed multiple bookings at the same time without slowing down.
- Database queries were optimized with indexing and relational integrity.

➢ *Security and Reliability:*

- Authentication methods prevented unauthorized access.
- Data integrity was kept intact across all transactions.

➢ *User Evaluation*

A pilot test was performed with a sample of users to evaluate usability and satisfaction:

- Ease of Use: Customers found that the dashboards were easy to use and responsive.
- Transparency: Real-time status updates and verified provider profiles built trust.
- Efficiency: Service providers noticed better visibility of their assigned jobs and improved scheduling control.
- Overall Satisfaction: Feedback indicated that Fixora reduced delays and improved communication compared to traditional service platforms.

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➢ *Comparative Analysis*

Compared to existing systems, Fixora showed clear improvements:

- Automation: Removed manual coordination by using AI-driven issue identification and smart matching.
- Transparency: Offered real-time tracking and secure dashboards for all users.
- Reliability: Ensured consistent service through verified professionals and a secure backend system.
- Scalability: Designed to support future mobile apps, multilingual features, and predictive maintenance.

➢ *Results*

The evaluation confirms that Fixora meets its design goals by:

- Delivering smooth booking and tracking of services.
- Providing accurate AI-based issue identification.
- Improving communication between customers and providers.
- Building trust through transparency and verified profiles.

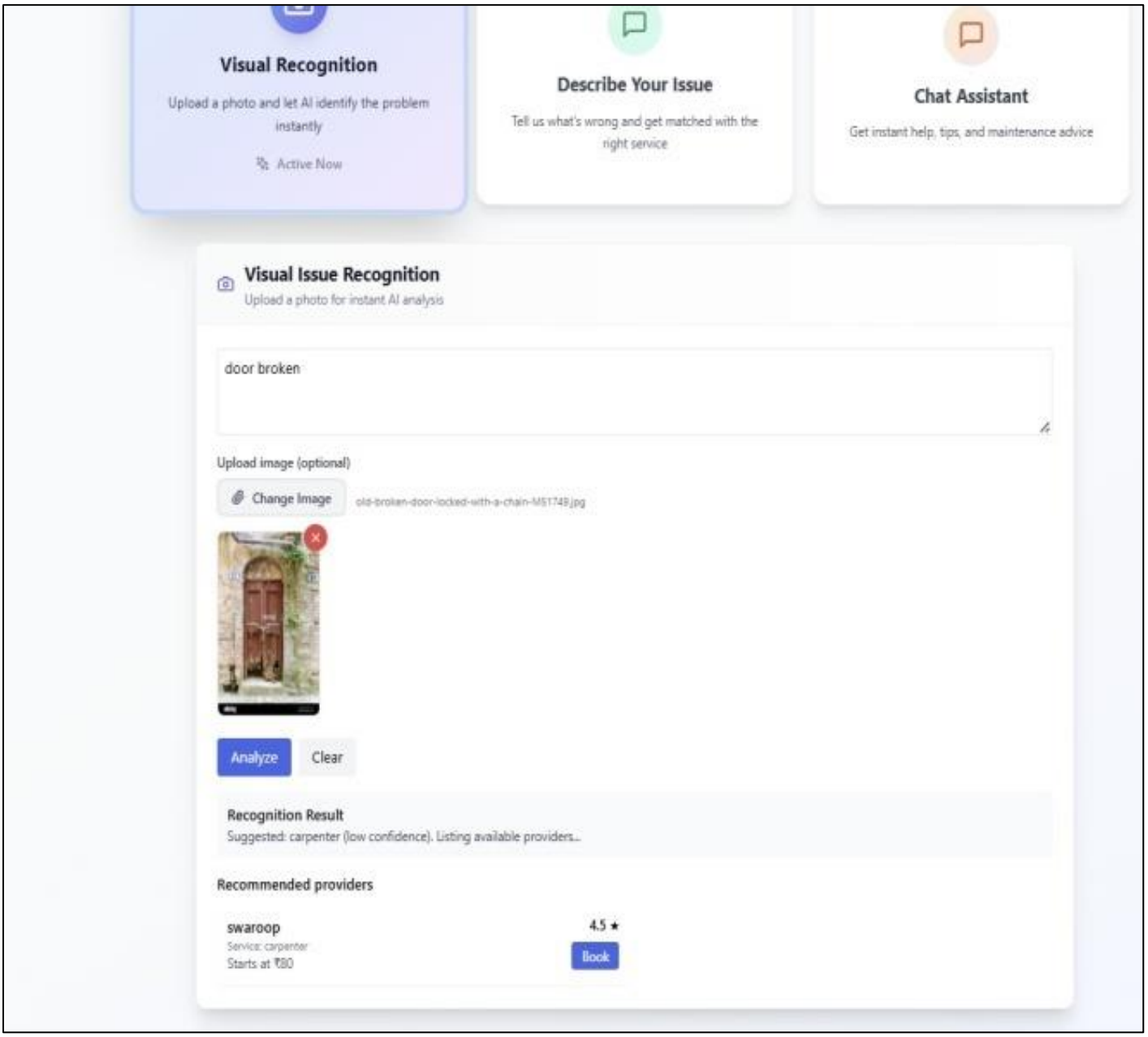

Fig 3: Results of Fixora

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VIII. CONCLUSION AND FUTURE SCOPE

The Fixora platform was created as a smart home maintenance management system that connects customers with verified service professionals in a secure, automated online environment. By combining artificial intelligence with full-stack web development, the system overcomes the challenges of traditional service platforms, such as manual coordination, scheduling conflicts, and a lack of transparency.

The platform features AI-based issue recognition from both text and image inputs, automatic matching with service providers, and real-time booking and tracking. Different dashboards for customers, service providers, and administrators ensure smooth interaction and responsibility among everyone involved. Testing and evaluation showed that Fixora works reliably in real-world situations, providing accurate issue classification, quick response times, and secure transactions.

In the future, Fixora has strong opportunities for growth. Planned improvements include creating dedicated mobile apps for Android and iOS, linking with GPS and Google Maps for accurate location detection, adding multilingual support to reach diverse communities, and introducing predictive maintenance features to anticipate service needs before problems arise. These upgrades will further strengthen Fixora's position as a complete, scalable, and smart solution for changing home service systems.

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