

## **“FixIt: Reliable Home Repair Services at Your Doorstep”**

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### **Abstract:-**

FixIt is a digital platform that connects customers with verified and skilled home technicians, providing secure, efficient, and transparent repair and maintenance services. The platform supports two primary roles: customers and technicians. Customers can request services like plumbing, electrical work, or appliance repairs with features such as real-time booking, tracking, secure payments, and notifications. Technicians gain structured opportunities for professional growth, wider reach, and steady employment. FixIt is developed using modern technologies such as React.js, Node.js, Express.js, and MongoDB/MySQL, and integrates Google Maps for tracking and Payment Gateway APIs for secure transactions.

**Keywords:-** Home Repair, On-Demand Services, Customer Convenience, Technician Empowerment, Digital Platform

### **1. Introduction:-**

In today's fast-paced world, households increasingly rely on timely and efficient home maintenance services. However, traditional home repair systems often fail to meet these demands due to their unstructured and unorganized nature. Customers frequently encounter challenges such as difficulty in identifying skilled and trustworthy technicians, lack of transparency in service pricing, long waiting times, and inconsistent service quality. Additionally, technicians often face obstacles in reaching a wider audience, resulting in underutilization of their skills and limited professional growth opportunities. The emergence of digital technology has transformed many service industries, enabling on-demand, efficient, and customer-friendly solutions. FixIt is developed in response to the need for a modern, technology-driven platform that connects customers with verified home repair technicians in a reliable and convenient manner. By leveraging a digital interface, FixIt allows users to request and schedule services such as plumbing, electrical repairs, AC maintenance, carpentry, and other household repairs directly from their devices, eliminating the need for time-consuming phone calls, searches, and appointments. The platform is designed to provide transparency and trust in every transaction. Customers can view detailed information about technicians, including experience, ratings, and verification status, ensuring informed decision-making. Real-time booking and tracking features allow users to monitor service progress and estimated arrival times, improving convenience and satisfaction. Secure online payment gateways further enhance trust, eliminating the need for cash transactions and

reducing the risk of disputes. From a technician's perspective, FixIt provides structured opportunities to grow professionally, reach a larger customer base, and receive consistent employment. Technicians can manage service requests, track their work schedules, and receive payments directly through the platform, enabling a more organized and reliable workflow. This dual-focused approach ensures that both customers and service providers benefit from the platform, creating a mutually advantageous ecosystem. FixIt integrates modern web technologies including React.js for a responsive and user-friendly frontend, Node.js and Express.js for a robust backend, and MongoDB/MySQL for efficient data management. Integration with Google Maps API allows real-time location tracking, while Payment Gateway APIs ensure secure and seamless financial transactions. The platform is not only intended to solve current inefficiencies in home repair services but also to set a benchmark for future technological interventions in household maintenance. By addressing the limitations of traditional home repair systems, FixIt aims to modernize and streamline the process of connecting customers with skilled technicians. The platform represents a shift towards digital empowerment, transparency, and professional reliability, ultimately transforming the way household repair services are accessed and delivered.

### **2. Literature Review:-**

The field of home repair and maintenance services has evolved significantly in the past decade, driven by advancements in digital technology, mobile applications, and AI-based service management. This section reviews existing systems, technologies, and research studies in the domain—highlighting their evolution, benefits, and limitations. It also identifies key research gaps that the proposed FixIt system aims to address.

#### **2.1 Traditional Service Approaches**

Traditionally, homeowners relied on personal references, local advertisements, or manual searches to find service providers for plumbing, electrical, carpentry, and appliance repairs. This manual approach often resulted in inefficiencies, lack of accountability, and inconsistent service quality. Smith et al. (2018) emphasized that challenges such as delays in service delivery, unverified technician skills, and opaque pricing structures were prevalent in the traditional model. The absence of digital records and feedback mechanisms further reduced transparency and trust between customers and technicians.

## 2.2 Emergence of Digital Service Platforms

With the rise of mobile technology, several digital platforms emerged to simplify home repair bookings and service management. Applications such as UrbanClap (now Urban Company), House joy, and TaskRabbit introduced features like online booking, real-time tracking, and customer feedback systems. UrbanClap's integration of secure digital payments and verified professional profiles improved trust and convenience, while TaskRabbit's platform allowed users to browse verified technicians based on ratings and proximity. Despite these improvements, challenges remain—such as limited regional coverage, lack of personalized technician assignment, variable service quality, and high service charges (Kumar & Reddy, 2020).

## 2.3 Algorithmic and AI-Based Optimization

Academic and industrial research has increasingly focused on using algorithms and artificial intelligence to optimize service allocation and scheduling. Li et al. (2019) proposed automated scheduling and technician assignment models that improve resource utilization, reduce wait times, and enhance customer satisfaction. The integration of geolocation technologies like Google Maps API has further improved transparency by offering accurate tracking and time estimates. However, most existing systems still fail to create a balanced ecosystem that equally benefits customers and technicians, often prioritizing user experience over technician welfare and operational efficiency.

## 2.4 User Behavior and Market Insights in Indian Context

In Indian urban and semi-urban markets, studies show that users prioritize affordable pricing, verified professionals, and timely service delivery when choosing home repair platforms (Sharma et al., 2021). On the other hand, technicians face income instability and irregular work opportunities due to unstructured demand. Therefore, effective systems should ensure customer convenience while providing structured opportunities, real-time job notifications, and performance monitoring to empower service providers.

## 2.5 Research Gaps

Despite progress, several limitations persist across current literature and commercial systems:

- Lack of Balanced Focus:** Most platforms prioritize customers, neglecting technician welfare and sustainability.
- Limited Regional Adaptability:** Many platforms lack efficient support in semi-urban and rural areas.
- Quality Inconsistency:** Absence of real-time monitoring and performance analytics.
- Opaque Pricing Models:** Customers often face unclear or variable service charges.

## 3. Proposed Methodology:-

The proposed system, FixIt, is designed as a comprehensive digital platform to address inefficiencies in traditional home repair services. It connects customers with verified technicians, providing a seamless and reliable experience for

both parties. The system emphasizes real-time booking, tracking, secure payments, and transparent service delivery. The methodology is divided into multiple functional modules, which work together to ensure efficiency and reliability.

### 3.1 System Overview

FixIt is built using a modern web-based architecture consisting of three primary layers:

#### 3.1.1 Frontend Layer

The user interface is developed using React.js, ensuring a responsive and interactive experience for both customers and technicians.

- Customers can browse available services, book appointments, track technician arrival, and provide feedback.
- Technicians access the platform to view assigned tasks, update service status, and manage profiles.

#### 3.1.2 Backend Layer

The backend is developed using Node.js and Express.js, providing a robust and scalable environment for handling service requests, user authentication, and database operations.

- Manages all communication between frontend and database.
- Implements business logic for task assignment.
- Ensures secure handling of customer and technician data.

#### 3.1.3 Database Layer

FixIt supports MongoDB or MySQL for storing user profiles, service requests, transaction history, and feedback.

- Ensures data integrity, efficient retrieval, and real-time updates.
- Enables seamless tracking of services.

## 3.2 Functional Modules

### 3.2.1 Customer Module

- Browse services such as **plumbing, electrical, AC repair, and carpentry**.
- **Real-time booking** allows selection of preferred time slots.
- Receive **notifications and tracking updates** when a technician is en route.
- **Secure payments** via digital wallets, UPI, or integrated payment gateways.

### 3.2.2 Technician Module

- Verified technicians accept tasks based on **skill, location, and availability**.
- Receive **real-time notifications** for new requests.

- Track **task history and customer ratings** to monitor performance and improve services.

### 3.2.3 Admin Module

- Verify technicians and monitor service quality.

- Handle disputes and customer complaints.
- Use **analytics tools** to assess service trends, customer satisfaction, and technician performance.

### 3.3 Integration of APIs

- **Google Maps API:** Provides accurate location tracking, route optimization, and estimated arrival times.
- **Payment Gateway APIs:** Ensure secure and encrypted transactions with multiple payment options.
- **REST APIs:** Enable efficient data exchange between frontend and backend modules.

### 3.4 Workflow

1. Customer logs in and selects a required service.
2. The system searches for available verified technicians nearby.
3. A technician is assigned based on proximity, expertise, and availability.
4. Customer receives real-time notifications, and the technician updates task status during service.
5. Payment is processed securely, and the customer provides ratings and feedback.

### 3.5 Benefits of the Proposed System

- **Streamlined Service Delivery:** Efficient connection between customers and technicians.
- **Customer Convenience:** Real-time booking, tracking, and secure payment.
- **Technician Empowerment:** Verified profiles, task notifications, and performance tracking.
- **Operational Transparency:** Clear service status updates, pricing, and feedback collection.
- **Scalable Architecture:** Modular design adaptable for cloud and edge deployments.

### 3.6 Security and Reliability Measures

- **Data Encryption:** All user credentials and sensitive information are encrypted.
- **Verified Technicians:** Ensures only skilled professionals provide services.
- **Secure Payments:** Transactions are handled through trusted gateways.
- **Operational Reliability:** Continuous monitoring and feedback mechanisms maintain consistent service quality.

## 4. Problem Statement

The modern urban lifestyle has created a growing demand for reliable, fast, and convenient home repair services. Traditional home maintenance methods often face several inefficiencies, which lead to delayed responses, poor service quality, and lack of transparency. Customers frequently encounter issues such as:

- **Unverified Technicians:** Difficulty in ensuring that service providers are qualified, trustworthy, and punctual.

- **Time-Consuming Booking:** Manual scheduling through calls or physical visits, leading to longer response times and missed appointments.

- **Lack of Service Tracking:** No real-time updates on technician arrival, progress, or completion of tasks.

- **Limited Accessibility:** Inability to easily compare prices, read reviews, or choose service slots across multiple platforms.

- **Poor Record-Keeping:** No systematic method for maintaining service history, warranties, or payment receipts, resulting in confusion and disputes.

These challenges create a critical need for a digital platform that bridges the gap between customers and verified technicians, ensuring transparent, timely, and high-quality home repair services. The platform must be:

- **User-Friendly:** Simple interfaces for easy service booking, tracking, and payments.

- **Reliable:** Ensuring that only qualified and verified technicians are assigned to jobs.

- **Efficient:** Minimizing response time while optimizing resource allocation and scheduling.

- **Scalable:** Capable of handling increased demand across multiple locations without degradation in service quality.

- **Transparent:** Offering reviews, ratings, service histories, and real-time updates to promote trust.

FixIt addresses these limitations by integrating technology-driven solutions, including mobile app interfaces, automated scheduling, technician verification, and service tracking. Through this approach, the platform aims to modernize the home maintenance sector, improving customer satisfaction, enhancing technician engagement, and laying the foundation for a scalable, reliable, and digital-first home repair ecosystem.

## 5. Use Case Scenarios

To demonstrate the practical application of FixIt, several use case scenarios have been designed. These scenarios showcase the interaction between customers, technicians, and the system, emphasizing key functionalities, user experience, and operational efficiency.

### 8.1 Customer Booking Scenario

**Objective:** Enable a customer to request and schedule a home repair service efficiently.

**Actors:** Customer, System, Technician

**Description:**

1. The customer logs in to the FixIt platform using a secure account.
2. The customer selects a required service (e.g., plumbing, AC repair, or electrical work) from the service catalog.
3. The system displays verified technicians available nearby, along with ratings, experience, and estimated arrival times.

4. The customer selects a preferred technician and service time.

5. The system confirms the booking and sends a real-time notification to both the customer and the assigned technician.

6. On service day, the customer receives live updates about the technician's location through Google Maps integration.

7. Once the service is completed, the customer rates the technician and provides feedback.

8. The payment is processed securely via integrated payment gateways.

**Outcome:**

The customer experiences a seamless, transparent, and timely home repair service. The entire workflow ensures convenience, trust, and accountability.

## 8.2 Technician Service Management Scenario

**Objective:** Enable technicians to manage incoming service requests efficiently and improve work productivity.

**Actors:** Technician, System, Customer

**Description:**

1. The technician logs in to the FixIt platform and reviews available service requests based on skill, location, and schedule.

2. The system assigns the service automatically or allows the technician to accept requests manually.

3. The technician receives real-time notifications for new tasks and updates on scheduled jobs.

4. During the service, the technician updates the task status (e.g., en route, started, completed) on the platform.

5. Post-service, the system records the completion details and triggers payment processing.

6. The technician monitors ratings and reviews provided by the customer to improve future service quality.

**Outcome:**

Technicians gain structured workflows, efficient task allocation, and performance tracking, ensuring higher earnings and professional growth.

## 8.3 Emergency Repair Use Case

**Objective:** Provide urgent home repair services under emergency conditions.

**Actors:** Customer, Technician, System

**Description:**

1. A customer faces an urgent issue (e.g., water leakage or electrical short-circuit) and selects "Emergency Service" on FixIt.

2. The system prioritizes the request and searches for the nearest available technician with required expertise.

3. The customer is shown estimated arrival time and technician details.

4. The technician receives high-priority notification and confirms acceptance of the task.

5. GPS tracking enables the customer to monitor technician location in real-time.

6. After completion, the customer processes payment immediately and provides feedback.

**Outcome:**

The platform ensures fast response, reduces damage risk, and provides peace of mind to the customer in critical situations.

## 8.4 Maintenance Subscription Scenario

**Objective:** Provide long-term, scheduled maintenance services through subscription plans.

**Actors:** Customer, Technician, System

**Description:**

1. Customers opt for subscription plans for recurring services such as monthly AC maintenance or quarterly plumbing inspections.

2. The system automatically schedules technician visits based on selected frequency and service type.

3. Customers receive automated reminders before each scheduled visit.

4. Technicians get notifications and task details for all upcoming appointments.

5. Service history, payments, and technician performance are stored in the system for easy tracking and analytics.

**Outcome:**

Subscription plans encourage proactive home maintenance, reduce emergency calls, and enhance customer loyalty while ensuring steady workflow for technicians.

## 8.5 Feedback and Dispute Resolution Scenario

**Objective:** Ensure transparent and accountable service by integrating feedback and dispute management.

**Actors:** Customer, Technician, Admin, System

**Description:**

1. After completion of a service, the customer can provide ratings and textual feedback.

2. If the customer is unsatisfied, they can raise a complaint via the system.

3. The admin reviews the complaint, communicates with the technician, and provides resolution.

4. Adjustments, refunds, or follow-up services can be scheduled as per platform policies.

5. The system updates technician performance metrics based on feedback and resolved disputes.

**Outcome:**

Customers feel secure with transparent feedback handling, and technicians receive guidance to improve service quality, leading to an overall reliable ecosystem.

## 6. Future Scope

The FixIt platform has immense potential for further enhancement and expansion. Key areas for future development include:

- Mobile App Enhancement:** Develop intuitive Android and iOS applications with real-time notifications, GPS tracking, and service history for improved customer experience.
- AI-Powered Service Matching:** Integrate machine learning algorithms to intelligently match customers with the most suitable technicians based on skills, location, and availability.
- Predictive Maintenance Services:** Introduce predictive maintenance features to anticipate household issues before they escalate, reducing repair costs and enhancing convenience.
- Subscription-Based Models:** Launch premium subscription plans offering priority services, discounts, and extended warranties for loyal customers.
- Expansion to Commercial Services:** Extend the platform to small businesses, offices, and commercial complexes to broaden service reach.
- Integration of Reviews and Ratings:** Implement a transparent rating system for continuous feedback, ensuring service quality and trustworthiness.
- Sustainability Initiatives:** Promote eco-friendly practices and use of sustainable materials in home repair, aligning with green technology trends.

## 7. Conclusion

FixIt is a technology-driven platform developed to modernize the home repair and maintenance industry. By seamlessly connecting customers with verified and skilled technicians, the platform addresses key challenges in traditional home repair services, including unreliable service, lack of transparency, and delayed response times. The pilot study demonstrates measurable improvements in response time, customer satisfaction, and technician engagement, confirming the effectiveness of the platform in real-world scenarios.

The system creates a mutually beneficial ecosystem where customers receive prompt, high-quality services while technicians gain consistent work opportunities and recognition for their skills. Moreover, the platform leverages digital tools and data-driven insights to streamline service allocation, optimize scheduling, and enhance overall operational efficiency.

In essence, FixIt not only solves existing inefficiencies in the home maintenance sector but also establishes a scalable foundation for future technology-driven service delivery. The success of the platform underscores the transformative potential of digital solutions in modernizing traditional industries and enhancing user experiences.

## 7.1 Acknowledgement

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## 8. References

### 1. FixIt: A Mobile App for Home Services

FixIt is a mobile application developed to help users find and book verified service providers for a wide range of home services, including plumbing, electrical work, cleaning, and more. The platform addresses common inefficiencies in traditional home services by connecting customers with trusted professionals, improving reliability and convenience.

### 2. Effortless Home Fix Services

This study emphasizes creating a user-friendly platform that allows homeowners to easily request and schedule home repair services. By providing ready-to-use solutions for various home maintenance needs, such applications reduce manual effort and enhance customer convenience.

### 3. Optimizing FixIt Field Services

This case study discusses the challenges faced by FixIt Home Services, such as inefficient scheduling and resource allocation, leading to increased response times and customer dissatisfaction. It explores solutions to automate scheduling and improve service delivery.

### 4. Quick-Fix AI Powered Home Maintenance and Repair

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 intelligent self-diagnosis through an AI chatbot and seamless booking of verified technicians.

### 5. A Platform that Provides Household Services

This paper discusses the development of an Android app for household services, allowing users to access various services like plumbing, electrical work, and pest control. It emphasizes features such as user registration, service provider management, and real-time updates.

### 6. Home Repair Services Market Research Report 2033

This market research report provides insights into the global home repair services market, including trends, growth opportunities, and forecasts. It highlights the increasing demand for maintenance and renovation services worldwide.