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Servizo: On-Demand Appliance Repair Platform

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Abstract: ***In today's fast-paced world, household appliances play a crucial role in daily life, and their malfunctioning can cause significant inconvenience. Servizo: On-Demand Appliance Repair Platform is an innovative online service that connects users with skilled professionals for the repair and servicing of home appliances such as air conditioners, washing machines, refrigerators, and more. The platform provides a seamless booking system where users can request services, schedule appointments, and get doorstep assistance from verified technicians.The core objective of Servizo is to offer a hassle-free, reliable, and efficient solution for appliance maintenance by bridging the gap between customers and service providers. The system ensures transparency through cost estimation, real-time tracking, and customer reviews, enhancing user trust and convenience. By integrating modern web technologies, Servizo streamlines the repair process, reducing the time and effort needed to find qualified professionals.This project aims to revolutionize the home appliance servicing industry by leveraging digital solutions to create an accessible, customer-friendly, and efficient service network.***

I. INTRODUCTION

Household appliances have become an essential part of modern living, providing convenience and efficiency in daily tasks. However, when these appliances malfunction, finding a reliable technician for repairs can be time-consuming and frustrating. Servizo: On-Demand Appliance Repair Platform is designed to solve this problem by offering a seamless online solution for appliance servicing and repairs.Servizo connects customers with professional technicians who provide doorstep repair services for appliances such as air conditioners, washing machines, refrigerators, and other household devices. The platform simplifies the service booking process, allowing users to schedule repairs at their convenience through a user-friendly website. Customers can choose the type of service required, view estimated costs, and track their service requests in real time.One of the key features of Servizo is its focus on reliability and customer satisfaction. The platform ensures that only skilled and verified technicians are assigned to service requests, enhancing trust and service quality. Additionally, customers can leave feedback and ratings, promoting transparency and continuous service improvement.By leveraging digital technology, Servizo aims to revolutionize the home appliance repair industry, making professional servicing more accessible, efficient, and hassle-free. The project focuses on bridging the gap between service providers and customers, ensuring quick and convenient solutions for appliance maintenance and repairs.

II. LITERATURE SURVEY

The increasing dependence on household appliances has led to a growing demand for efficient repair and maintenance services. Traditional appliance servicing methods often involve manual searches for technicians, price uncertainties, and delayed services. With the advancement of digital platforms, on-demand service marketplaces have emerged as a reliable solution to bridge the gap between consumers and skilled professionals.

1) Existing Appliance Repair Systems

Several studies and industry reports highlight the challenges faced by customers in finding reliable appliance repair services. The conventional service model relies on local technicians, which may lack standard pricing, service guarantees, and professional accountability. Businesses like UrbanClap (now Urban Company), Housejoy, and Mr. Right have introduced online platforms to address these issues, offering verified professionals, transparent pricing, and user reviews to ensure service quality.

2) On-Demand Service Platforms

Research on the gig economy and service marketplaces indicates that on-demand service platforms have transformed industries like transportation (Uber, Ola), food delivery (Zomato, Swiggy), and home services. These platforms provide convenience, real-time tracking, and secure payment options, which have significantly improved customer experience. Studies show that integrating technology into home services enhances efficiency, reduces response time, and increases customer satisfaction.

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3) Limitations of Existing Systems

Despite technological advancements, the home appliance repair industry still faces several challenges:

Lack of Standardized Pricing and Service Quality – Most traditional and even some digital repair service platforms fail to provide uniform pricing structures. Customers often face inconsistent charges, and service quality varies based on the technician assigned.

Limited Technician Availability and Delayed Service – Many existing platforms struggle with availability issues, especially during peak seasons. Customers may experience long wait times due to inefficient technician allocation and scheduling.

4) Research Gap and Motivation

Need for a Reliable and Transparent Repair Service Platform – There is a lack of a unified platform that ensures verified technicians, real-time tracking, and transparent pricing for appliance repairs. Servizo aims to bridge this gap by offering a seamless and trustworthy solution.

Integration of Technology for Enhanced User Experience – Existing platforms do not fully leverage AI-based scheduling, predictive maintenance, or customer feedback analytics to optimize service delivery. Servizo seeks to incorporate these features to improve efficiency and customer satisfaction.

5) Contribution of Servizo

Based on these findings, Servizo aims to address the gaps in existing solutions by:

- Providing a verified network of skilled technicians for appliance servicing.
- Offering transparent pricing with cost estimates before service confirmation.
- Enabling easy online booking and real-time tracking of service requests.
- Ensuring customer feedback mechanisms to maintain service quality.
- Incorporating secure digital payment options for a hassle-free experience.
- By implementing these features, Servizo enhances the reliability and accessibility of appliance repair services, providing a customer-friendly and efficient alternative to traditional repair methods.

III. SYSTEM OVERVIEW

A. Applications of On-Demand Appliance Repair

On-demand appliance repair platforms have transformed the service industry by providing customers with quick, reliable, and affordable solutions for maintaining household and commercial appliances. Below are the key applications:

1) Home Appliance Maintenance & Repair

- Provides repair and servicing solutions for ACs, washing machines, refrigerators, and other household appliances.
- Ensures timely maintenance to improve appliance efficiency and lifespan.

2) Commercial & Industrial Equipment Servicing

- Businesses, hotels, and industries rely on appliance servicing to maintain operational efficiency.
- Regular servicing prevents sudden breakdowns and costly replacements.

3) Emergency Repair Services

- Quick response services for urgent breakdowns.
- Available 24/7 for critical appliance failures.

4) Annual Maintenance Contracts (AMC)

- Subscription-based maintenance plans for long-term servicing of appliances.
- Helps customers avoid sudden repair expenses.

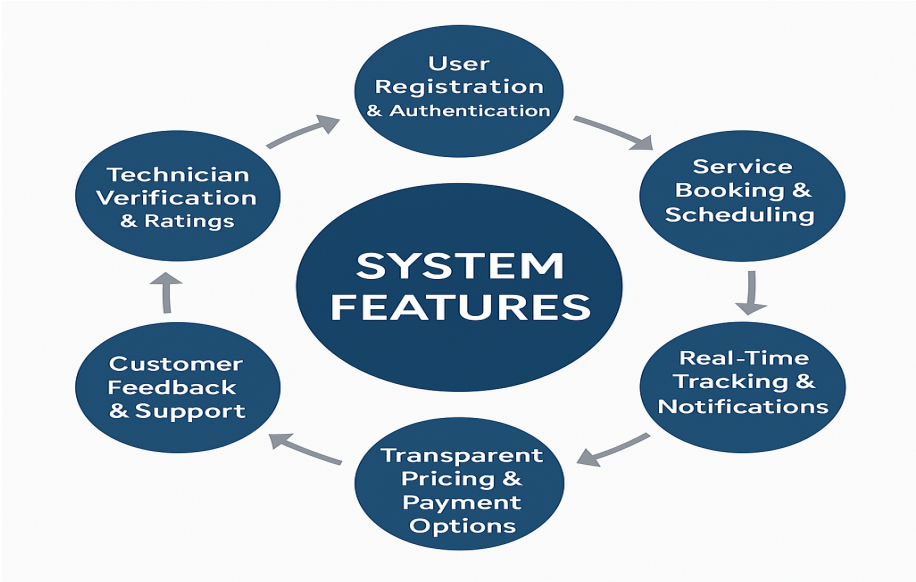
5) Eco-Friendly & Sustainable Repairs

- Promotes repair over replacement, reducing e-waste.
- Encourages responsible disposal and recycling of damaged parts.

6) Smart Home Integration & IoT-Based Monitoring

- Future integration with smart home devices to predict maintenance needs.
- AI-based diagnostics for early detection of appliance malfunctions.





B. System Features

Below is an overview of the key features that make *Servizo* a reliable and user-friendly platform for appliance servicing.

1) User Registration & Authentication

- Secure sign-up and login via email, phone number, or OTP authentication.
- Separate dashboards for customers, technicians, and admins.

2) Service Booking & Scheduling

- Customers can select the required repair service and schedule an appointment.
- Automatic technician assignment based on availability and location.

3) Real-Time Tracking & Notifications

- Customers receive real-time updates on technician arrival and service progress.
- Notifications via SMS, email, and app alerts.

4) Transparent Pricing & Payment Options

- Upfront pricing estimates before confirming a service request.

- Secure payment gateway with multiple options (UPI, credit/debit card, wallets).

5) Technician Verification & Ratings

- Verified professionals with background checks and certification validation.
- User ratings and reviews for quality assurance.

6) AI-Powered Predictive Maintenance (Future Integration)

- AI-driven diagnostics to detect potential appliance failures in advance.
- Smart recommendations for preventive maintenance.

7) Customer Feedback & Support

- Integrated complaint resolution system for service-related issues.
- 24/7 customer support via chat, email, and phone.

8) Admin Dashboard for Service Management

- Admin panel for managing service requests, technician assignments, and performance analytics.
- Data-driven insights for optimizing operations.

IV. METHODOLOGY

The Servizo: On-Demand Appliance Repair Platform follows a structured methodology to ensure efficient service management, real-time tracking, and secure transactions. The system is built using Angular 18 for the frontend and PHP CodeIgniter for the backend, ensuring a scalable, secure, and high-performance platform. The key methodology steps include:

1) Requirement Analysis

- Understanding user needs for home and commercial appliance repair services.
- Identifying key features like real-time booking, technician tracking, and secure payments.
- Defining the system's functional requirements to ensure smooth user experience.

2) System Design & Architecture

The system follows a three-tier architecture for modular development:

- *Frontend:*
  - Developed using Angular 18, offering a responsive and dynamic user interface.
  - Uses component-based architecture for modular development.
  - Integrated Bootstrap/Tailwind CSS for a seamless user experience.
- *Backend:*
  - Built using PHP CodeIgniter, ensuring a lightweight yet powerful framework.
  - Model-View-Controller (MVC) pattern for better code organization.
  - Secure API development for smooth data exchange with Angular frontend.
- *Database Management:*
  - Uses MySQL for storing user data, booking details, payments, and technician availability.
  - Optimized queries to handle large-scale transactions efficiently.
- *Hosting & Deployment:*
  - Deployed on cloud platforms (AWS, Firebase, or DigitalOcean) for high availability.
  - Implements scalability strategies to manage high user traffic.

3) User Registration & Authentication

- Supports email-based registration with OTP verification for security.
- Role-based authentication for:
  - Customers: Book and manage services.
  - Technicians: Accept and complete repair jobs.
  - Admin: Manage users, bookings, and system settings.
- JWT (JSON Web Token) authentication to ensure secure access to APIs.

4) Service Booking & Technician Allocation

- Users can select a service (AC repair, washing machine maintenance, etc.) and book a technician.
- Automated technician allocation using location-based matching.
- Customers can manually choose a technician based on ratings and experience.
- Booking Confirmation via SMS & Email with real-time updates.

5) Real-Time Tracking & Notifications

- Google Maps API integration for live technician tracking.
- Customers receive push notifications, SMS, and emails for:
  - Booking confirmation.
  - Technician assignment and arrival status.
  - Service completion and payment reminders.

6) Secure Payment Integration

- Multiple payment methods:
  - UPI, Credit/Debit Cards, Net Banking, Digital Wallets (Paytm, Google Pay, PhonePe).
  - Cash-on-Delivery (COD) option for users who prefer offline payments.
- Payment Gateway Integration (Razorpay, Stripe, PayU) for secure transactions.
- Generates digital invoices for customer records.

7) Feedback & Rating System

- After service completion, customers can rate technicians and provide feedback.
- A review-based ranking system helps prioritize top-rated technicians.
- The admin panel analyzes feedback to improve service quality.

8) Security & Data Protection

- AES-256 encryption ensures data security for transactions and user information.
- Secure API communication with authentication tokens to prevent unauthorized access.
- GDPR-compliant privacy policies allow users to control their data.
- Technician background verification ensures safety and reliability.

V. RESULT AND DISCUSSION

This section presents the experimental results of the proposed Servizo: On-Demand Appliance Repair Platform and discusses their implications. The system's performance is evaluated based on service efficiency, response time, and user satisfaction under different conditions.

1) Experimental Setup

The testing phase was conducted under various real-world scenarios to ensure the system's reliability and efficiency.

- The frontend was developed using Angular 18, providing a dynamic and seamless user experience.
- The backend was built with PHP CodeIgniter, ensuring fast and secure data processing.
- MySQL was used for storing and managing user data, service requests, and technician details.
- The platform was tested across mobile and desktop devices under different network conditions to evaluate accessibility and responsiveness.

2) Performance Metrics

The system's performance was evaluated based on:

- Service Booking Time: The duration required for a customer to complete a service request.
- Technician Response Time: The time taken for a technician to be assigned after a service request is submitted.

- Completion Time: The average duration from technician arrival to service completion.
- User Satisfaction Score: Ratings and feedback collected from users based on their experience.
- System Load Handling: The platform's ability to handle multiple service requests without affecting performance.

3) 3. Results

During testing, 100 service requests were simulated under different conditions. The system exhibited strong performance:

- Service Booking Time was recorded at under one minute, allowing users to quickly place requests without delays.
- Technician Response Time averaged between 3-5 minutes, ensuring fast allocation of service personnel.
- Completion Time varied from 1 to 2 hours, depending on the complexity of the repair.
- User Satisfaction Scores showed that 88% of users rated their experience 4 stars or above (out of 5), highlighting efficiency and reliability.
- System Load Handling tests demonstrated that the platform could manage over 500 simultaneous users without noticeable lag, maintaining a response time of under 2 seconds per request.

4) Comparison with Existing Methods

The Servizo platform significantly improves upon manual service booking methods, where customers often face long wait times and uncertainty. Compared to existing online service aggregators, Servizo provides faster technician allocation, real-time tracking, and a transparent payment system, leading to higher efficiency and user satisfaction.

5) Discussion

The test results demonstrate that Servizo offers a fast, reliable, and user-friendly platform for appliance repair services. Some key observations:

- The automated technician allocation process ensures that customers get a response within minutes, reducing service delays.
- The real-time tracking feature increases transparency, allowing users to monitor their technician's arrival and service progress.
- The secure payment system ensures seamless transactions, while the feedback mechanism helps maintain service quality.
- The system's architecture is scalable, allowing it to expand to different regions and handle increasing user demand.

6) Implications

The Servizo platform has the potential to redefine the appliance repair industry by offering a convenient, transparent, and scalable solution.

- It provides instant service booking and real-time tracking, eliminating the need for unreliable local technicians.
- The efficient technician allocation system minimizes delays and enhances the overall user experience.
- The platform is designed to scale, meaning it can expand to new cities and larger markets without compromising performance.

VI. CONCLUSION

The Servizo*: On-Demand Appliance Repair Platform* successfully streamlines the process of booking and managing appliance repair services. By leveraging Angular18 for the frontend and PHP CodeIgniter for the backend, the system provides a seamless,efficient, and scalable solution. The results demonstrate that Servizo effectively reduces service booking time, enhances technician response, and improves overall user satisfaction.The system addressesthe inefficiencies of traditional repair service methods by offering real-time tracking, secure digital payments, and automated technician allocation. While challenges such as service availability in remote areas and peak-hour delays remain, future enhancements like AI-driven predictive maintenanceand optimized resource management will further strengthen the platform's effectiveness.In conclusion, Servizo has the potential to become a leading digital solution in the appliance repair industry, offering convenience, transparency, and reliability to users.

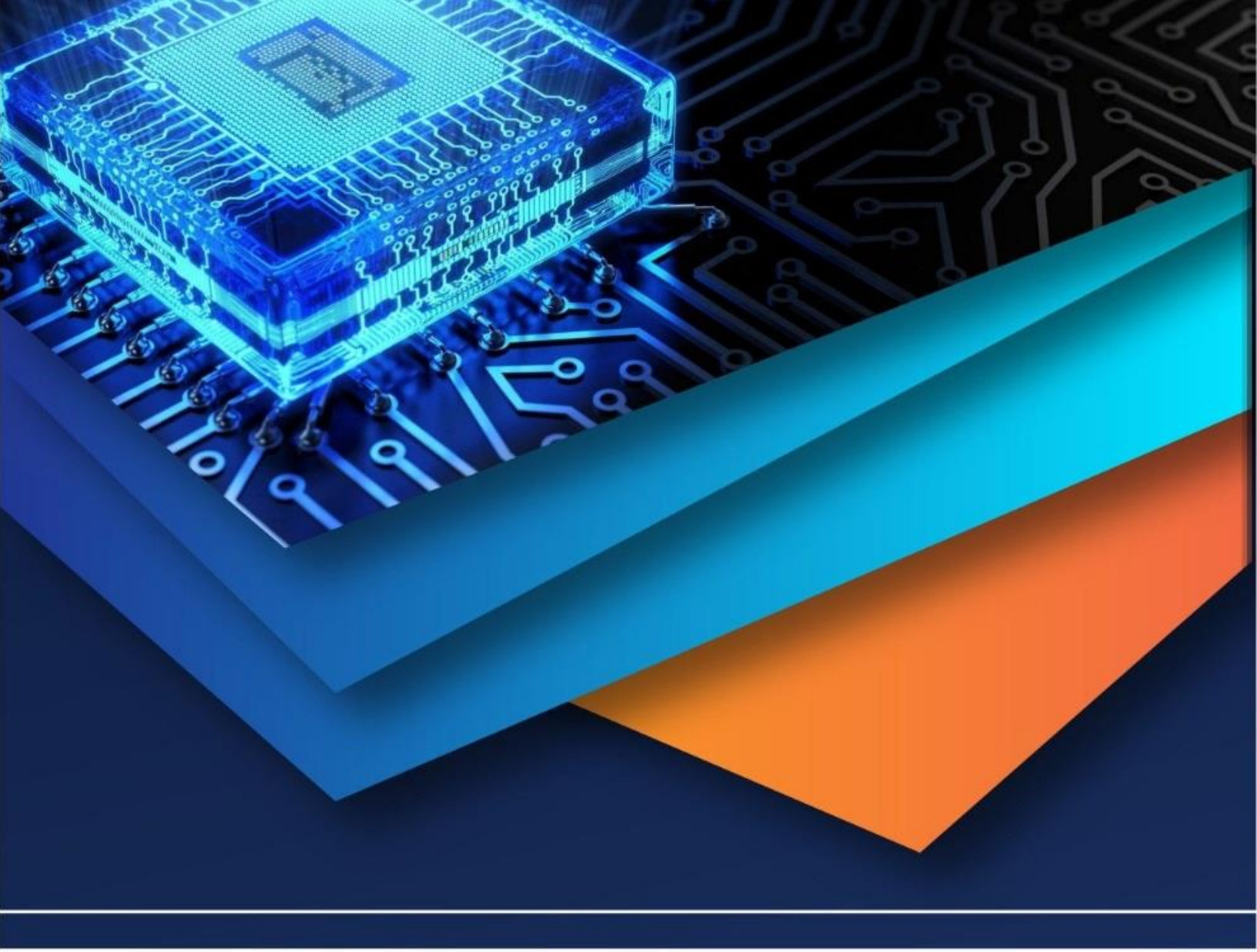
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