

A Review Article on Smart Residential Services

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Abstract - This paper presents the design and development of an intelligent residential service management system titled "Smart Residential Services." The system offers an organized and efficient way for residents of apartments or societies to access essential maintenance services such as plumbing, electrical, housekeeping, and more. Traditional methods of requesting maintenance services often face issues of inefficiency, delayed responses, and lack of real-time status updates. To overcome these limitations, the proposed solution integrates modern web technologies for real-time service booking, worker status tracking (busy/free), and streamlined communication among residents, workers, and administrators. The platform offers a user-friendly web-based application with distinct logins for admins, workers, and residents, enhancing the overall residential experience. Through automation and digitalization, Smart Residential Services aim to simplify service requests and improve the quality of life in apartment communities.

Key Words: Residential Service Management, Worker Status Tracking, Web-based Application, Spring Boot, Angular.js, MySQL Database

1. INTRODUCTION

In contemporary urban environments, the need for efficient residential service management has grown significantly. Traditional systems for handling essential services in apartment complexes, such as plumbing, electrical work, or general maintenance, often suffer from inefficiencies, lack of transparency, and delays in communication. This necessitates a shift towards a centralized, technology-driven solution that can address these challenges.

The Smart Residential Services platform is designed to revolutionize apartment service management by offering a streamlined and user-centric approach. It integrates advanced web technologies to create a cohesive system where residents, workers, and administrators can interact seamlessly. Residents can register, log in, and request services, while workers can manage tasks and update their availability status in real time.

Administrators oversee the system, ensuring data integrity and efficient operations. Managing essential services in

apartment complexes, such as plumbing and electrical repairs, often involves inefficiencies and delays.

The Smart Residential Services platform addresses these issues by offering a centralized, web-based solution that connects residents, service providers, and administrators.

1.1 Objectives

The primary objective of the Smart Residential Services system is to streamline the service management process for residential communities by providing a centralized, digital platform for residents, workers, and administrators. The system aims to offer real-time service booking, efficient worker assignment based on availability, and quick resolution of maintenance requests. By enabling role-based logins and tracking worker statuses as 'free' or 'busy,' the platform ensures transparency and reduces the response time for service delivery. Additionally, it seeks to enhance the living experience of residents by simplifying service access, improving communication, minimizing manual intervention, and optimizing resource allocation within the community. The project ultimately aspires to create a smart, organized, and efficient residential environment through the use of modern web technologies.

1.2 Scope

The system targets residential apartments, housing societies, gated communities, and large campuses where multiple service categories are needed daily. Smart Residential Services aims to automate:

- Service booking (plumbing, electrical, cleaning, etc.)
- Worker assignment based on availability
- Worker busy/free status updates
- Complaint handling and tracking
- Admin control over workers and service records

Future enhancements could integrate IoT devices for predictive maintenance and mobile app versions for broader accessibility.

1.3 Literature Survey

Ref. No.	Reference paper Name	Author Name	Method
[1]	Survey Paper On Housing Society Management System	Adukathil Arjun, Agganuru Saiprasad, Parui Priyadarshan, Chakraborty Shriyansh, Prof. Sangeetha Selvan	The Housing Society Management System aims to make the current situation in society simple and efficient. During a pandemic such as the current covid-19, it's not appropriate to step out of the house for tasks such as viewing the notice board or conveying an important message to flat mates
[2]	Empirical Analysis on Hotel Online Booking Consumer's Satisfaction with E-service of Website	Hongyun Kuang, Jie Yang	Suggestions are given to improve online booking consumer satisfaction, such as website designing of easier using, timely processing of orders, offering more offline personal support for online service, doing more communication with customers, providing more communication channel and so on.
[3]	E-Housing Society	Nikita Dethe, Anagha Dhande, Shubham Gavali, Prof. Sonal Chaudhari	EHousing Society exactly follows this phrase and aims at making the current situation in the society simple and efficient. Society Management System reduces the conflicts that arise within the society by providing facilities such as maintenance management, displaying notices and events, managing parking issues and also the complaints raised by society members, it also deals with the lift issues and sends a direct message to the service person. It

			automates certain attributes that occur within the society and makes it easy for the members of the society an easy access to the society happenings and on goings.
[4]	Application for House Maintenance Service	Pavan Kalaskar, Nikhil Khartode, Omkar Mote, Amol Marathe, Shailesh Hule	Nowadays people are busy with their heavy work culture, engaged schedules. Managing our own time is a hectic task for all of us and if we get encountered with unexpected issues it leadsto distraction and frustration. If we consider the current scenario, the Owner is worried about the property maintenance and the tenant has the headache of maintaining and solving the property problems like Plumbing, Electrical, Electronic, and Home Paint.
[5]	Household Veritas - A platform that provides household services	Apeksha Adekar, Aakash Dalvi, Pratik Gharat, Pushti Ratanghayra	Android app development for household services is a growing field that aims to provide convenience and ease to homeowners and service providers alike. However, creating an Android app for household services requires careful consideration of several aspects, such as a strong landing page, booking management, and user experience.

2. Methodology

The development of the Smart Residential Services platform follows a systematic methodology to ensure efficiency, scalability, and user satisfaction. The process begins with requirement analysis, where stakeholders, including residents, workers, and administrators, are identified, and their needs are gathered through surveys and interviews.

A robust system architecture is designed, incorporating a role-based access control mechanism to segregate functionalities for admins, residents, and workers. The system is monitored for performance, and user feedback is incorporated for continuous improvement and scalability.

Resident Login: Book services, track request status.

Worker Login: View assigned jobs, update job status.

Admin Login: Manage residents, workers, services, and analytics.

Real-Time Status Updates: Workers can set status (Free/Busy).

3. Module Descriptions

3.1 House Holder Login

This module is designed for the residents living in apartments or societies. Each resident is provided with a login where they can enter their username and password to access the system. Once logged in, the resident can easily request services like plumbing, electrical work, or housekeeping by filling a simple service request form. The resident can also track the status of their request, see which worker is assigned, and get notifications when the job is completed. This makes it very easy for residents to get the help they need without making multiple phone calls or visits.

3.2 Worker Login

This module is specially made for the service workers like electricians, plumbers, cleaners, etc. Each worker has their own login details. After logging in, the worker can see the list of service requests assigned to them. They can accept a new job, start working, and after completing the service, they can mark it as done. Workers can also set their status as "Busy" when they are working on a task and "Free" when they are available to take up new service requests. This system helps in managing their time properly and ensures that no resident request is missed.

3.3 Admin Login

The administrator plays a very important role in the system. Through the Admin Login module, the admin can manage all users of the system including residents and workers. The admin can add new workers, approve resident registrations, assign service requests to available workers, and even check the progress of all the tasks. If a worker is busy, the admin can find another free worker to complete the service. The admin can also generate reports about completed services, pending requests, and worker performances to improve the service quality.

3.4 Worker Assignment Module

This module handles the main operation of booking a service. When a resident books a service request, the system checks the availability of workers. If a worker is free, the system automatically assigns the worker to the job or informs the admin to manually assign if needed. The worker and the resident both get notifications about the assigned service. This helps in quick allocation of work and saves a lot of time for both residents and workers.

3.5 Tracking Module

This module is responsible for managing the status of each worker. Every time a worker starts working on a request, they change their status to "Busy," and after completing the job, they set it back to "Free." This live tracking of worker availability helps the system to know which worker is free at any given time and assign work accordingly. It reduces confusion, avoids double bookings, and improves the smooth flow of operations.

4. Existing System

In an era where convenience and efficiency are paramount, the demand for reliable home maintenance services has significantly increased. Homeowners often encounter urgent issues that require immediate attention, such as plumbing leaks, electrical failures, and other repair needs. However, finding qualified professionals can be a daunting task, often leading to frustration and delays.

Earlier, maintenance complaints were recorded through manual registers or phone calls at the apartment security desk.

No real-time tracking of service requests. Residents faced delays without visibility into worker availability. Management teams had to manually allocate tasks and follow-up on job status.

Modern societies require faster, more reliable service systems. Manual processes are now being replaced with digital portals or apps to reduce errors, enhance transparency, and improve resident satisfaction.

5. Use Case Diagram

Use case diagrams identify the functionality provided by the system (use cases), the users who interact with the system (actors), and the association between the users and the functionality. Use cases are used in the analysis phase of software development to articulate the high-level requirements of the system.

5.1. Workflow Explanation:

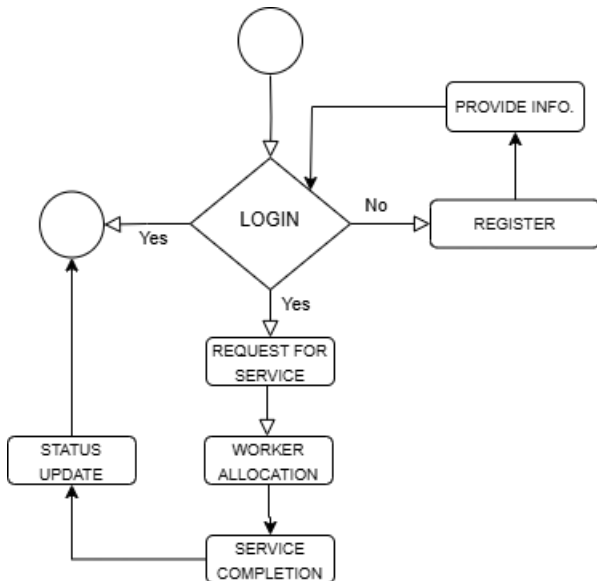


Fig -1: User Activity Diagram

User Register:

The Fig-1 shows User Activity In this user can log in or if user is new so he will register from their title like worker or house holder and phone number and other details to web-app, then admin will verify user and worker and house holders they will be able to see various services available for their apartments.

Request Service:

After a house holder logged in then according to their need they can apply for any service they need (like plumbing, electrician, etc) and worker will also log in to their module.

Allocation of Worker:

After worker login and see how many requests they received by house holders according to their services (like plumber, electrician, etc) and worker will be accept the request then the worker will assign to the request of a house holder for work.

Service Completion:

After service allocation worker will complete the work and update the status after that admin will have to verify the service is completed or not

Status Update:

After service completion worker updates the status of the request made by user to fully complete the service, user can review the worker based on their work and satisfaction about their request.

6. CONCLUSIONS

This Services platform provides an innovative and efficient solution to managing services within residential complexes. The system’s ability to handle service requests, track worker availability in real-time, and automate service allocation significantly enhances the overall management process. Furthermore, the platform’s modular design allows for easy scalability and future integration of new features, such as IoT-based monitoring or advanced data analytics. This project not only addresses the operational inefficiencies in traditional apartment service management but also improves the user experience by providing a digital, centralized solution that can be accessed easily by all stakeholders. Smart Residential Services offers a practical, scalable, and user-friendly system that can transform the way residential service management is handled in urban living environments.

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