

# ServiceLink: Developing a centralized Digital Framework for Demand Household Service Delivery

P. Mathivanan\*, M. Vasuki\*\*

\*(Student, Department of Master Computer Application, Sri Manakula Vinayagar Engineering College, Pondicherry, India  
Email: mathiprakash2002@gmail.com)

\*\* (Professor, Department of Master Computer Application, Sri Manakula Vinayagar Engineering College, Pondicherry, India  
Email: vasukimca@smvec.ac.in)

\*\*\*\*\*

## Abstract:

The rapid growth of urbanization and the rising demand for convenience have changed the household service industry. Traditional ways of finding service professionals like plumbers, electricians, carpenters, cleaners, and pest control experts are often slow, inefficient, and unclear. This paper introduces ServiceLink, a central web-based platform that connects customers with verified household service providers through a smart digital setup. The system combines service discovery, real-time booking, location-based provider matching, secure payment processing, and customer feedback into one platform. It is built using Python Flask, MySQL, HTML, CSS, JavaScript, and Bootstrap technologies. By improving service allocation and provider management, the platform boosts customer satisfaction and opens new opportunities for independent service professionals. Testing shows better service accessibility, faster booking, more provider visibility, and higher overall service quality. This framework aids in the digital transformation of the household service sector by providing a scalable, secure, and user-friendly solution.

**Keywords** — Household Services, Service Booking System, Digital Platform, Flask Framework, Location Tracking, Service Provider Management, Smart Matching Algorithm, Web Application.

\*\*\*\*\*

## I. INTRODUCTION

In modern society, household maintenance and repair services are essential for daily living. Services like plumbing, electrical repairs, carpentry, home cleaning, appliance maintenance, pest control, and painting are often needed by households and businesses. Despite the increasing demand for these services, customers frequently struggle to find trustworthy and skilled professionals quickly.

Traditional methods of finding services rely heavily on personal referrals, newspaper ads, local directories, and social media recommendations. These approaches often cause delays, create uncertainty about service quality, lead to inconsistent pricing, and result in a lack of accountability.

Furthermore, customers have few options to assess service providers before hiring them.

The rise of information technology and mobile internet has opened the door to digitizing household service delivery systems. Online service platforms can offer centralized access to service providers while delivering transparency, efficiency, and real-time communication.

The ServiceLink platform tackles these issues by creating a web-based ecosystem that allows customers to search for, compare, book, and review service providers through a single interface. The system uses location-based service matching, automated booking management, secure payments, and performance evaluation tools to improve overall service delivery efficiency.

The main goal of this research is to create a reliable digital framework that improves accessibility, transparency, accountability, and customer satisfaction in the household service industry.

## II. LITERATURE SURVEY

Saundariya et al [1] proposed a web application for handyman booking using MongoDB, Express.js, React.js, and Node.js technologies. Their platform focused on simplifying the service booking process through modern web technologies. However, the study lacked advanced service provider ranking mechanisms and real-time location tracking capabilities.

Aravindhyan et al [2] developed a web-based on-demand home service system that connected customers with service professionals. The platform improved service accessibility but faced limitations regarding dynamic appointment scheduling and intelligent service allocation.

Indravasan et al. [3] presented an online household service system designed to streamline home maintenance requests. Their research highlighted the importance of digital service booking but lacked advanced analytics and service provider verification mechanisms.

Kasamani and Gikundi [4] introduced a location-based handyman ordering service that utilized geographical information systems for provider identification. Their work demonstrated the effectiveness of location-aware service discovery but did not incorporate customer rating systems.

Bandekar and D'Silva. [5] proposed an Android-based home service application focused on improving mobile accessibility. While the application provided basic service booking functionality, it lacked integrated payment systems and administrative monitoring features.

## III. EXISTING SYSTEM

Current household service platforms work independently and offer limited features. Popular platforms like Yellow Pages, OLX, Facebook

Marketplace, Lynk, and Whodoyou help users find service providers through search and recommendation.

These systems have several issues:

### 1) Problems Identified

- Difficulty in checking service provider credentials.
- No standardized pricing.
- No real-time service tracking.
- Little transparency about service quality.
- Slow communication between customers and providers.
- Reliance on manual service selection.

### 2) Limitations

- No intelligent matching system.
- Unreliable review and rating systems.
- Limited help for emergency service requests.
- No centralized service management.
- Weak security and trust systems.

## IV. PROPOSED SYSTEM

ServiceLink is a centralized web-based solution to make it easier for consumers to book and manage their household services. With ServiceLink, customers can use one digital environment to connect with verified service providers from which to book services, find professionals who meet their needs, compare quotes, and make a booking. Automation increases transparency and improves access to services while streamlining the time it takes to find trusted professionals. Since multiple functionalities are combined into one platform, ServiceLink improves the customer and service providers' overall experience.

### Customer Module

The customer module allows users to register so they can access all possible household services via

an intuitive user interface. Customers have the option to search by service provider by category, rating, experience, and/or location. Within the module, customers can schedule service appointments according to their preferred date and time. In addition, they can track their service providers in real-time and receive notifications regarding their scheduled appointments. Secure payment options are available for customers to use during their transactions. Upon the conclusion of the service being performed, customers will have an opportunity to rate and review their service provider to assess the quality of the service.

### **Service Provider Module**

The provider module enables service professionals to create and manage their service profile in an organized manner. Providers can edit their service details, availability, and pricing information as needed. When a customer submits a request to perform a service, the provider receives a notification.

### **Administrator Module**

The Administrator Module allows for the overall administration and monitoring of activities conducted on the platform. This means that Administrators will verify the registration of service providers to have access to the platform. Administrators will be responsible for overseeing customer bookings, service requests and payments, as well as user accounts. The Administrator can also resolve any disputes or complaints received from users. Reports of services, users and transactions can be generated to help in the analysis of these transactions. This module also assists in the functioning of the system, its security and reliability.

### **Benefits of the New System**

There are many advantages to using this system instead of traditional service booking methods. First, the system allows customers to quickly access verifiable service providers. Second, there is less manual work for Customers

and Providers. Third, customers can receive real time tracking and notification on their service request allowing better communication between both parties. Fourth, the payment systems are secure and provide assurance of safe and timely transfer of funds from Customers to Service Providers. Lastly, the reviews and ratings create transparency and accountability between the services and customers. Therefore, the proposed system will increase customer satisfaction, operational productivity and service quality.

## **V. SYSTEM ARCHITECTURE**

The proposed ServiceLink system follows a three-tier architecture that consists of the Presentation Layer, Application Layer, and Database Layer. This architecture enables efficient communication between customers, service providers, and administrators while ensuring secure data management and smooth service delivery. Each layer performs specific tasks and contributes to the overall functionality of the platform.

### **Presentation Layer**

The Presentation Layer is the graphical interface that allows all individuals utilizing the ServiceLink application to access it; Clients will be able to Search for Services, Book Appointments and Pay for Services through this layer; Service Providers will have an efficient way to manage their profiles and requests to provide services; Administrators will have access to monitor the activities of the system and create reports and will thus have a consolidated view of the actions being taken by all users. The Presentation Layer provides an easy-to-use, responsive and user-friendly experience to all stakeholders.

### **Functionality**

- Client Dashboard
- Service Provider Dashboard
- Administrator Dashboard
- User Registration and Sign-In
- Service Request Submission Interface

### **Application Layer**

The application layer of the system processes all incoming user requests and interacts with each of the modules in the system by facilitating communication among the modules. This layer also validates the user's identity using their credentials when a user registers or logs into the system. Once a customer has requested a service, this layer determines appropriate service providers by reviewing criteria such as category, geographical location (the service availability area), availability (of the service provider), and ratings (from prior customers). Additionally, this layer is responsible for managing scheduling, confirmation of appointment bookings, processing of payments, and delivering notifications to customers. This layer also processes customer-generated reviews and ratings to evaluate the quality of the services provided. Lastly, this layer is responsible for controlling all aspects of the business operations within the system, making the application layer (the core) the catalyst for the successful operation of the entire system

### **Functionality**

- Booking Management
- Service Matching
- Authentication and Authorization
- Payment Processing
- Notification Management
- Review and Rating Management

### **Database Layer**

All data needed for operation of the platform and to operate the platform is stored and managed in the Database Layer. The Database Layer is the primary location of all data related to the customer, the provider, booking details, and transaction information.

The Database Layer stores all information about customers, service providers, bookings, payment records and reviews and ratings in a structured manner. Each time a user interacts with the platform the related information is retrieved from and/or updated to the Database. The Database is built using MYSQL for durable storage, consistent storage, and secure storage of customer profiles, provider

information, service requests and transaction history. The Database also provides information to generate reports and to support performance analysis for administrative purposes. Good management of the Database facilitates improvement of scalability, efficiency and overall reliability of the system system.

### **3) Functionality:**

- User Profile Storage
- Service Information Management
- Booking Records
- Payment Information
- Reviews and Ratings Storage
- Review Generation
- Report Generation Data

## **VI. METHODOLOGY**

### **Phase 1: User Registration and Authentication:**

The first phase of the Household Service Management System focuses on user registration and authentication. The purpose of this phase is to provide secure access to customers, service providers, and administrators through account creation and login verification. Users are required to enter details such as their username, email address, mobile number, and password. Upon successful validation of these inputs, the system generates a user account and grants secure login access. This phase enhances system security by preventing unauthorized access, maintaining user privacy, simplifying account management, and ensuring secure user authentication.

### **Phase 2: Service Search and Discovery:**

The second phase enables customers to search for household services that match their specific requirements and preferences. Users can provide inputs such as the desired service category, location, and personal preferences. Based on these criteria, the system displays a list of available service providers. This functionality allows quick service discovery, saves customers' time, improves accessibility to services, supports easy comparison among providers, and offers a user-friendly search experience.

**Phase 3: Service Provider Selection:** In this phase, customers are allowed to select the most suitable service provider based on various factors such as provider information, ratings, and availability status. The system processes these inputs and presents the selected provider for the requested service. This approach improves customer decision-making, ensures service quality, enhances customer satisfaction, provides transparent evaluation of providers, and supports reliable provider selection.

**Phase 4: Appointment Booking:** The appointment booking phase enables customers to schedule services according to their preferred date and time. Customers provide inputs including the booking date, booking time, and service details. The system then confirms the appointment and updates the booking records accordingly. This automated process offers convenient scheduling, reduces manual effort, improves appointment management, facilitates better coordination between customers and service providers, and speeds up the booking process.

**Phase 5: Service Request Processing:** This phase is responsible for processing customer service requests and forwarding them to the appropriate service providers. Inputs such as customer requests and service information are analyzed by the system to determine whether the request can be approved or rejected. The process ensures efficient request handling, facilitates faster communication, provides real-time status updates, improves workflow management, and supports effective allocation of services.

**Phase 6: Service Execution:** The service execution phase facilitates the completion of household services by the assigned service providers. Once the service request is confirmed, inputs including the confirmed request details and customer location are used to perform the required service. The final output is the successful completion of the requested service. This phase contributes to timely service delivery, enhances customer experience, improves service quality, ensures efficient task execution, and increases reliability.

**Phase 7: Payment Processing:** The payment processing phase provides customers

with secure and convenient payment options for completed services. Customers enter details such as the payment amount and preferred payment method. After successful verification, the system generates payment confirmation. This phase ensures secure financial transactions, supports multiple payment methods, speeds up payment processing, minimizes payment disputes, and improves financial transparency.

**Phase 8: Review and Feedback Collection:** Following service completion, the system collects customer feedback and ratings to evaluate the performance of service providers. Customers submit ratings and review comments, which are then used to generate provider performance evaluations. This mechanism helps improve service quality, increases transparency within the platform, builds customer trust, encourages accountability among service providers, and supports continuous improvement.

**Phase 9: Administrative Monitoring:** The final phase focuses on monitoring and managing the overall activities of the Household Service Management System. Administrators utilize inputs such as user data, booking records, and transaction information to generate reports and implement system updates. This phase enables effective system control, enhances platform management, improves security, supports faster issue resolution, and increases overall operational efficiency.

## VII. ALGORITHM USED

### Smart Service Matching Algorithm

The Smart Service Matching Algorithm is a core component of the ServiceLink platform that identifies and recommends the most appropriate service provider based on a customer's service request. The algorithm evaluates several important factors, including the requested service category, customer location, provider availability, professional experience, and customer ratings to ensure efficient and accurate service allocation. By automating the provider selection process, the system reduces the effort required from customers and enhances the overall booking experience. It enables customers to quickly locate reliable professionals while ensuring a fair distribution of service requests among available providers.

The algorithm begins by receiving inputs such as the customer's location, the selected service category, provider availability details, provider ratings, and years of professional experience. The first processing stage involves **provider filtering**, where the system examines all registered service providers and selects only those who offer the household service requested by the customer. This filtering process eliminates irrelevant records, reduces unnecessary data processing, and improves search efficiency.

The next stage is **location matching**, in which the system compares the customer's location with the locations of the filtered service providers. Providers situated closer to the customer are assigned higher priority, as proximity reduces travel time and contributes to faster service delivery. This approach improves responsiveness and customer convenience.

Following location analysis, the system performs **availability verification**. During this stage, the algorithm checks whether the shortlisted providers are currently available to accept new service requests. Providers who are already engaged in appointments or marked as unavailable are removed from the matching process. This ensures that only providers capable of fulfilling the request are considered, thereby improving appointment scheduling efficiency.

The algorithm then proceeds to **rating and experience analysis**. It evaluates customer ratings and the professional experience of each eligible provider to assess service quality and reliability. Providers with higher ratings and greater experience receive better ranking scores, allowing customers to choose professionals who have demonstrated competence and customer satisfaction. This ranking mechanism promotes high-quality service delivery and builds trust within the platform.

In the final processing stage, known as **service allocation**, the system calculates the overall ranking scores of all eligible providers and arranges them in descending order. The highest-ranked provider is recommended to the customer, while the complete ranked list is displayed as alternative options. The customer can then confirm the preferred provider and proceed with appointment scheduling. Upon

confirmation, the system generates a booking request and allocates the service accordingly.

The outputs generated by the Smart Service Matching Algorithm include the best-matched service provider, a ranked list of eligible providers, booking recommendations, and service allocation confirmation. These outputs assist customers in making informed decisions while simplifying the service booking process.

The algorithm significantly improves the efficiency of household service booking by automatically identifying suitable service providers. Instead of manually searching and comparing professionals, customers receive a filtered and prioritized list based on predefined criteria. The use of location-based filtering minimizes response time, while rating- and experience-based ranking enhances service quality. Since the algorithm evaluates only relevant providers, the overall processing time remains efficient, improving provider utilization and reducing booking delays. Consequently, this approach enhances platform performance, increases customer satisfaction, and contributes to the reliability of the ServiceLink platform.

The Smart Service Matching Algorithm offers several advantages. It provides quick and accurate provider recommendations, reduces customer effort in searching for professionals, and improves service quality through rating-based selection. The use of location matching supports faster service delivery, while availability verification enhances appointment scheduling efficiency. In addition, the algorithm ensures fair allocation of service requests among providers, increases customer trust and satisfaction, and improves the overall performance and effectiveness of the ServiceLink platform.

## VIII. RESULT AND DISCUSSION

The ServiceLink platform has been implemented and tested, with the objective of determining how well it meets functional, performance, security and user satisfaction criteria. The platform includes a mix of modules which include customer management, service provider management, scheduling appointments, processing payments, real-time tracking of service providers, as well as

managing reviews. The results show that the ServiceLink platform is efficient, meets the full requirements of all stakeholders and allows customers to search for services, schedule appointments, track providers, make payments and submit reviews through one main interface.

All major functional areas were tested within the platform's major modules. The testing case used to verify various functional areas included: registering new users, authenticating via the login process, searching for services, submitting a booking request, processing a payment, receiving notifications about your booking, managing reviews. The results for each of these tests confirmed that the ServiceLink Platform was able to perform each of the individual functional tests with success, as anticipated. This included the successful processing of new requests, confirmation of approved bookings with service providers, scheduling of appointments and successfully processing of payment transactions by going through all functional tests without any significant issues. The results indicated that the majority of the test cases achieved a pass rating, in turn confirming the reliability of the proposed platform.

Performance testing was completed to assess the platform's responsiveness and reliability under various instances of operation. The results of testing demonstrated acceptable response times for service requests, booking confirmations, and payment processing. Also contributing to the improved overall performance of the ServiceLink Platform is the well-structured optimized database, and the methods used for processing service requests. The results of the performance tests confirmed that User data and system resource security were confirmed through security testing. Authentications, session managements, access controls, and data validations were all tested for the security of operations within the user application and provider application systems. All tests completed successfully with the ability of ServiceLink to hold data integrity and confidentiality for customers and providers confirmed.

Compared to a traditional method of booking household services, the ServiceLink platform is significantly more efficient and convenient for the customer because it automates the discovery of service providers, appointment scheduling, service provider tracking, payment collection, and customer service feedback management. In addition, tracking of service providers and the multiple payment options contribute significantly to improving the customer experience and transparency of service provision.

In the analysis of the customer satisfaction survey, the results demonstrated a high level of satisfaction for customers and service providers. The customers indicated they appreciate the ease of searching for service providers, making appointments, and tracking service providers. The service providers also benefit from increased visibility, simplified management of booking appointments, and enhanced communications with customers. The review and rating system allow for improvement of service quality and provides for accountability across the system. Based upon the results, the ServiceLink platform represents an improvement over traditional booking methods.

## **IX. CONCLUSION**

The ServiceLink platform was built to solve problems that exist when you book or find home services using standard methods. The proposed platform is a simple, user-friendly central place where customers can easily find, schedule and manage home services.

This system integrates management of service providers, scheduling appointments, making payments, tracking service providers and providing feedback into one system, which gives a comprehensive solution for current requirements of managing home services.

Based on the implementation and testing results, the platform is functioning correctly and efficiently under different operational modes. The automated workflow features will greatly reduce the number of manual steps and improve communications between

customers and service providers. The features of tracking service providers using a location-based system, providing customers with online payment processing capabilities, scheduling appointments, managing customer feedback and providing customers with a greater understanding of their purchases have resulted in a more transparent experience for both the customer and the service provider.

ServiceLink is also providing benefits to the service providers by providing them with a virtual marketplace in which to manage their profiles and bookings, track their earnings and improve their customer service based upon feedback from their customers. The platform provides administrators with monitoring and reporting tools to support their effective management and control of the platform's operations. The successful completion of system testing demonstrates that the platform is ready to be implemented and will reliably provide a means for managing home services.

The ServiceLink platform is assisting with the digital transformation of the home service management industry.

## **X. FUTURE SCOPE**

Although the ServiceLink platform successfully meets current household service management requirements, several enhancements can be incorporated in future versions to improve functionality and scalability. One possible enhancement is the inclusion of additional service categories such as home security installation, landscaping, computer maintenance, and specialized repair services. Expanding the service portfolio will allow the platform to serve a broader customer base and support diverse household requirements.

Another important enhancement involves extending platform availability to multiple cities and regions. Expanding geographical coverage will increase service accessibility and create new business opportunities for service providers. The system can also incorporate loyalty programs where frequent customers receive rewards, discounts, or complimentary services after completing a specified

number of bookings. Such features can improve customer retention and encourage repeated platform usage.

Future versions may integrate Artificial Intelligence and Machine Learning techniques to provide personalized service recommendations based on user preferences, service history, and behavioral patterns. AI-driven recommendation engines can improve service matching accuracy and customer satisfaction. Mobile application development for Android and iOS platforms can further enhance accessibility and convenience for users.

Additional enhancements may include voice-based service booking, chatbot support, predictive demand analysis, advanced analytics dashboards, and blockchain-based payment verification. A guaranteed service period and automated dispute resolution mechanisms can also strengthen customer trust and service quality. These future improvements will enable ServiceLink to evolve into a more intelligent, scalable, and customer-centric household service management ecosystem.

## **XI. REFERENCES**

- [1] K. Saundariya, M. Abirami, K. R. Senthil, D. Prabakaran, B. Srimathi and G. Nagarajan, "Webapp Service for Booking Handyman Using MongoDB Express JS React JS Node JS," International Conference on Signal Processing and Communication, 2021.
- [2] K. Aravindhyan, K. Periyakaruppan, T. S. Anusa and A. Lakshmi Priya, "Web Application Based On Demand Home Service System," International Conference on Advanced Computing and Communication Systems, 2020.
- [3] N. M. Indravasan, A. G. S. C and K. Shanthi, "An Online System for Household Services," International Journal of Engineering Research and Technology, 2018.
- [4] Bernard Kasamani and Denis Gikundi, "A Location-Based Service for Handyman Order Placement," Journal of Systems Integration, 2017.
- [5] F Sheetal Bandekar and Avril D'Silva, "Domestic Android Application for Home Services," International Journal of Computer Applications, 2016.

- [6] Prachi S. Tambe et al., “An Online System for Home Services,” *International Journal of Scientific Development and Research*, 2020.
- [7] Eric Matthes, *Python Crash Course*, No Starch Press, 2019.
- [8] Miguel Grinberg, *Flask Web Development*, O’Reilly Media, 2018.
- [9] Robin Nixon, *Learning MySQL*, O’Reilly Media, 2021.
- [10] Wes McKinney, *Python for Data Analysis*, O’Reilly Media, 2022.