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ServePro: Service Provider System

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Abstract

ServePro: Service Provider System is a dynamic, web-based solution that bridges the gap between service seekers and professional vendors across a wide range of domains, including but not limited to plumbing, electrical repairs, and home maintenance. This platform is engineered to eliminate the delays and inefficiencies associated with traditional methods of hiring local services. By allowing users to post their service needs or complaints, the platform enables vendors to respond in real time, ensuring quicker and more efficient service delivery. In addition to its core service matchmaking functionality, ServePro also includes a versatile marketplace where both users and vendors can buy, sell, donate, rent, or exchange various products. The platform is equipped with advanced modules for complaint management, task assignment, and real-time notification updates, offering a streamlined and intuitive user experience. With a strong emphasis on security, scalability, and user-friendliness, ServePro aims to revolutionize how individuals interact with local service providers. It holds significant potential for future expansion into broader e-commerce and service-based sectors.

Keywords: Web-based solution, task acceptance, complaint management, product listing, scalability, security

INTRODUCTION

Service requests for home maintenance, like product exchanges, plumbing, or electrical repairs, are frequently processed ineffectively through unofficial channels, which causes delays, misunderstandings, and discontent. In order to address these problems, the proposed service provider platform provides a well-structured, open, and effective online platform where customers can file grievances or tasks, and vendors can accept and finish them. This platform has a feature that allows the user to be immediately informed when a task is assigned to the first vendor to accept a complaint. Users and vendors can actively list, purchase, sell, and trade goods on the platform's integrated marketplace. By combining product listing, renting, donating, exchanging, and complaint management within a unified system, the platform serves as a comprehensive solution. It offers users and vendors a one-stop shop that ensures a seamless and efficient experience, addressing diverse needs while fostering transparency and convenience. People can register and create detailed profiles with all of their personal information and preferences in the User module.

Several studies have informed the development of this platform. Zhen et al. [1] demonstrated that intelligent task allocation models—particularly those using first-come, first-served (FCFS) mechanisms—can significantly improve service completion times and enhance user satisfaction. Ramphal [2] emphasized the importance of complaint tracking and real-time feedback in building trust and transparency between users and service providers. Hsu and Chen [3] further highlighted the need for secure file upload mechanisms, recommending encryption, and artificial intelligence (AI)-based malware detection to protect sensitive data. These insights have been instrumental in shaping ServePro's core features, including real-time notifications [4], encrypted document handling, and automated complaint resolution.

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Numerous service categories, including plumbing, electrical work, house cleaning, and more, are available on the user dashboard. Users are taken to a form where they can fill out the specifics of their request after choosing a service. Because this form is dynamic, it can be customized according to the kind of service required. Following completion and submission of the form, the request is uploaded to the platform, where all pertinent vendors can see it. Similar in strength, the Vendor module lets service providers create comprehensive profiles that showcase their areas of expertise, availability, and service offerings. Vendors are notified when a new service request matching their category is posted. They can examine the request's specifics and determine whether to approve it. A fair and effective distribution of work is ensured by automatically assigning the task to the first vendor to accept the request. After a request is approved, the platform helps the user and the vendor exchange contact details so that the vendor can arrange the service directly. The platform's ultimate goal is to revolutionize the way services and products are accessed and managed by providing a one-stop, adaptable solution. Its scalable nature ensures potential expansion into other domains, such as integrated e-commerce or advanced service modules, solidifying ServePro as a versatile and indispensable tool for modern service and product management needs.

LITERATURE REVIEW

Several studies have explored different aspects of service request systems, task allocation, complaint management, secure file uploads, and online marketplaces, all of which are relevant to the proposed service platform.

Smart City Service Request Systems

Cabrera et al. investigated real-time data processing technologies and the internet of things (IoT) for managing urban services such as road maintenance and waste management [5]. Their study demonstrated that integrating real-time decision-making processes significantly reduces response times for service requests, leading to improved user satisfaction. Furthermore, the research highlighted that incorporating automated data analytics into urban management leads to enhanced user satisfaction and increased operational transparency. These findings underscore the necessity of integrating real-time decision-making processes into smart city frameworks to ensure the seamless delivery of essential urban services. The implementation of such systems allows municipal authorities to proactively address infrastructure issues and service disruptions, ultimately improving the quality of urban life.

Task Allocation in Online Service Platforms

Zhen et al. introduced an algorithm designed to connect service providers with tasks based on factors such as availability, skill set, and geographical location [1]. The results of their research demonstrated that machine learning-based task allocation significantly reduces service completion times while improving overall customer satisfaction. The study also examined the impact of different task assignment models, including first-come, first-served (FCFS), auction-based assignments, and AI-driven prioritization. Among these models, the FCFS approach showed a balance between efficiency and fairness, making it particularly suitable for service platforms handling high volumes of user requests. The research concluded that intelligent task allocation systems contribute to platform scalability and reliability, ensuring that users receive timely and high-quality service. These findings support the implementation of AI-driven task allocation mechanisms in modern service provider platforms to enhance operational efficiency and user experience.

Complaint Management Systems

Ramphal examined a customer complaint resolution system across various service sectors [2]. His findings revealed that real-time tracking, status updates, and automated complaint resolution mechanisms significantly improved customer satisfaction. These insights emphasize the necessity of integrating real-time notifications and complaint tracking features within the proposed platform to enhance user retention and trust. The findings indicated that users prefer platforms that provide instant feedback and status updates on their complaints, as this transparency fosters trust and confidence in the

service provider. Furthermore, the study highlighted the effectiveness of sentiment analysis in complaint management systems, allowing platforms to prioritize and escalate complaints based on user sentiment and urgency.

Secure File Upload Mechanisms

Hsu and Chen explored security protocols for file uploads in online services [3]. Their study found that platforms employing multi-layered security measures and encrypted file storage were significantly more effective in safeguarding sensitive user data. The authors emphasized the risks associated with malware-infected file submissions and proposed the integration of AI-driven file scanning to detect and prevent malicious content. Their findings underscore the importance of secure file upload mechanisms in service provider platforms, especially those handling complaint-related documents, legal contracts, and financial records. By adopting best practices such as encryption, secure storage, and access control, service platforms can enhance data security and build trust among users.

Online Marketplaces for Product Exchange

Yeap et al. analyzed factors influencing the success of peer-to-peer product exchange platforms [6]. They also examined the impact of user reviews and reputation systems in influencing buyer and seller decisions. Their research identified transparency, ease of use, and secure transaction processes as key determinants of user engagement. Their findings suggest that implementing a rating system, escrow services, and secure dispute resolution mechanisms significantly enhances user confidence in online transactions. The study concluded that a well-designed marketplace module, incorporating transparency, security, and ease of use, can drive engagement and retention, making it a crucial component of modern service provider platforms.

Optimizing Task Allocation in Service-Oriented E-Commerce Systems

Huang and Abnoosian concentrated on enhancing task distribution in service-oriented e-commerce platforms [7]. Their research sought to tackle the difficulties related to effective task oversight, particularly in variable environments where demand changes and resources need to be distributed immediately. The authors suggested a novel strategy grounded in mixed integer programming (MIP) to assign tasks effectively to service providers based on various factors, including the provider's availability, skillset, and geographical closeness to the customer. The study revealed that this optimization method substantially accelerated task completion times and overall service effectiveness. By incorporating these sophisticated algorithms, the research underscored the significance of strategic task distribution in elevating service quality and the operational efficacy of service-oriented e-commerce systems. This method could be particularly beneficial for platforms managing extensive task volumes and necessitating real-time service execution.

PROPOSED SYSTEM

The proposed system is an innovative and efficient service provider platform designed to bridge the gap between users seeking various services and vendors offering them. It allows users to register, create profiles, and post-service requests for tasks such as plumbing, electrical repairs, and other essential services. Vendors can also register and create service profiles, enabling them to browse user tasks and accept them in real-time, promoting swift service delivery. The system incorporates features such as real-time notifications, complaint management, secure document uploads, and a product marketplace where users and vendors can buy, sell, exchange, or rent items. A significant advantage of this system is its task assignment process, which automatically assigns tasks to the first available vendor who accepts, ensuring timely service and reducing delays. Furthermore, the platform includes an admin module for monitoring and controlling user and vendor activities, thereby ensuring the system’s security and transparency. The platform serves as a secure and versatile marketplace where users and vendors can engage in various product-related activities, including listing, buying, selling, renting, donating, and exchanging items. It provides a seamless interface for users to resell products such as electronic appliances, enabling them to extend the lifecycle of their devices while benefiting economically.

Additionally, the platform fosters a spirit of generosity by allowing users to donate items like children's toys to those in need. For sustainable consumption, users can exchange items such as clothes, promoting a circular economy. Furthermore, the platform facilitates renting, enabling users to share products such as driller machines, glue guns, and other tools on a short-term basis. This comprehensive marketplace ensures transparency, security, and ease of use, addressing diverse user needs while promoting sustainable and resource-efficient practices. By promoting sustainability and efficient resource use, the system addresses the challenges of modern service provision. Designed to be scalable, secure, and user-friendly, it offers a comprehensive solution to the demands of today's service-oriented environments. With its emphasis on innovation and adaptability, this platform has the potential to become a leading solution for connecting users and service providers in an increasingly interconnected world. The system is designed to be scalable, user-friendly, and secure, offering a comprehensive solution to modern service provider challenges. Considering the attacks [8], the application will be secured using various security techniques.

SYSTEM ARCHITECHTURE

The architecture, as depicted in Figure 1, shows how a ServePro: Service Provider System operates. The ServePro system was developed to enable user-vendor interactions via a single platform. Both users and suppliers submit their login credentials to access their accounts at the Login screen, which is where it all starts. Users can manage their service requests and keep track of any complaints they have filed by navigating to the User Dashboard after logging in [9]. On the other hand, vendors are directed to the Vendor Dashboard, where they can monitor their work and reply to service inquiries. The Query Form, which both users and suppliers use to submit and receive requests, is a crucial part of the system. Users can specify the services they need using this form, and vendors can reply with their availability or confirmation. Following submission, these requests are entered into a central database. Because it keeps track of all user profiles, vendor information, and service requests, this database is essential for making sure that everything is methodically arranged and readily available. Additionally, the system has a Notification feature that notifies suppliers and users of any updates or activities. Both parties will be notified, for example, if a vendor approves a request or if the status changes. These notifications, which help everyone keep informed and involved, can be sent by email or in-app messages. In conclusion, the way vendors and users interact and manage their services is improved by this methodical and transparent architecture. By combining all of these components, the ServePro Platform makes it easier for customers to find trustworthy service providers and gives vendors the resources they need to run their companies efficiently, creating a friendly and connected community.

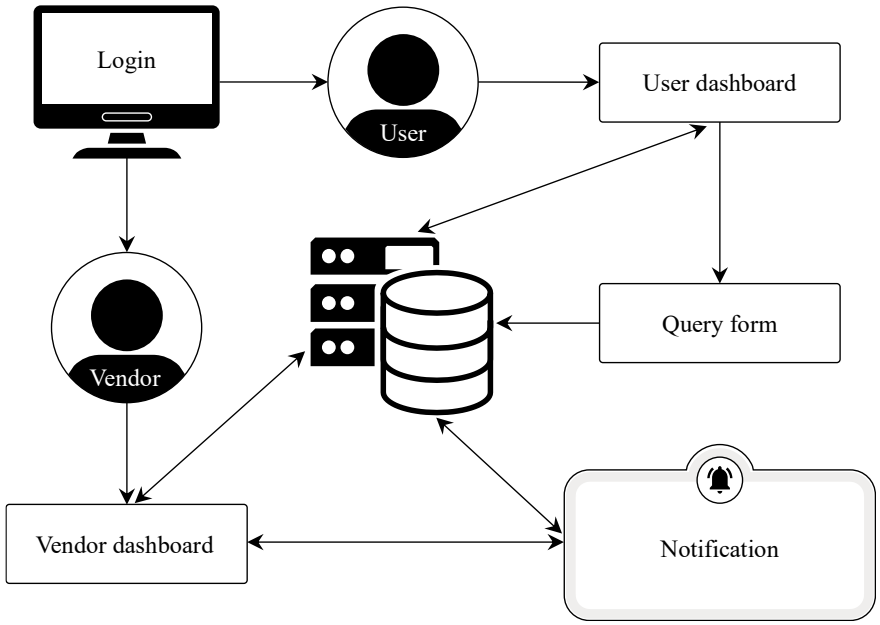

Figure 1. System architecture of ServePro: Service Provider System.

COMPONENTS

1. *User module:* This module allows users to create profiles, update personal information, and manage their accounts. Users can submit complaints or tasks for various services (e.g., plumbing, electrical repairs) and track the progress of their requests.
2. *Vendor module:* Vendors can create profiles, update their service details, and browse available tasks. The system allows vendors to accept tasks in real-time, with the first vendor who accepts the task being assigned to it.
3. *Complaint management module:* This module handles the submission, tracking, and resolution of user complaints. Once a complaint is submitted, it becomes available for vendors to view and accept.
4. *Product marketplace module:* A secure platform where users and vendors can list, buy, rent, donate, sell, or exchange product. The system ensures transparency and user trust through secure transactions and real-time updates.
5. *Admin module:* The admin module provides full control over user and vendor activities. Admins can monitor complaint submissions, task assignments, product listings, and handle disputes or other issues.
6. *Notification module:* This module manages the delivery of real-time notifications to users and vendors. Notifications include task status changes, product interactions, and complaint updates.
7. *Secure file upload module*: This module ensures that both users and vendors can securely upload necessary documents related to their complaints or tasks. The system utilizes encryption and secure storage to protect sensitive information.
8. *Task assignment module*: A critical module for matching user's complaints with vendors. The first vendor to accept a task is automatically assigned, ensuring quick service response times.
9. *Search and filter module:* This module enables users and vendors to search for services, tasks, or products using various filters such as location, service type, and product category [10].
10. *Payment module*: While not fully implemented in the current version, this module can handle payments between users and vendors or between buyers and sellers in the marketplace.

FUTURE SCOPE

1. *Integration with IoT devices:* In future iterations, the platform could be integrated with IoT devices for tasks that require remote monitoring or automation, such as home security or smart home repairs.
2. *Machine learning for task optimization:* Implementing machine learning algorithms to further optimize task assignments based on vendor skills, proximity, and customer ratings.
3. *Mobile application development:* Expanding the platform into a mobile app to reach a wider audience and enhance user engagement.
4. *Expansion into other service areas:* The platform could be expanded to cover more service categories such as healthcare, legal services, or professional consultancy.
5. *Block chain for secure transactions:* Future versions could incorporate block chain technology to ensure secure and transparent transactions between users and vendors in the product marketplace.

CONCLUSION

The ServePro: Service Provider System aims to revolutionize the way service requests and complaints are handled by providing a streamlined, user-friendly solution for both users and vendors. By integrating task assignments, complaint tracking, and a secure product marketplace, the platform creates an efficient and transparent environment. The system's real-time notifications and secure file management enhance the user experience, ensuring that all interactions between users and vendors are timely and secure. Additionally, the product marketplace offers unique features, such as the ability for users to rent, donate, exchange, or resell items like tools, toys, clothing, and electronic appliances. The platform's scalability and modular architecture also provide a strong foundation for future expansion into other service areas, making it a versatile solution for the service industry.

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