PROJECT REPORT

HOUSEHOLD SERVICES APP

BACHELOR OF SCIENCE (BS)
DEGREE IN DATA SCIENCE AND APPLICATIONS

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Presentation video Link:
https://drive.google.com/file/d/1KFysndhAFN9Jpn9hd-LOp_PIltJdMGra/view?usp=sharing

1. Project Context and Problem Statement

In today's fast-paced urban lifestyle, managing household services has become a significant challenge. Many people face difficulties when it comes to finding reliable service providers who offer quality work. The challenges include verifying the professionalism and credibility of providers, comparing services based on quality and price, and seamlessly managing the booking, payment, and scheduling of these services. The Household Service Application addresses these issues by providing a digital platform that connects customers directly with verified professionals. This platform aims to simplify the discovery and booking of services, offer transparency in service pricing and quality, and provide a trustworthy space for both customers and service providers.

2. Project Objectives

The primary goal of this project is to create a comprehensive online platform where users can easily discover and book household services. A secure user registration and verification process is key to ensuring the credibility of both customers and service providers. The platform will feature an intuitive catalog with advanced search functionalities and a reliable review system for both customers and professionals. Additionally, ensuring the security of the platform and safeguarding user data are essential objectives. The project aims to reduce the time customers spend searching for trusted service providers, improve service transparency, and create an easy-to-use interface that simplifies the process of booking and managing household services.

3. Functional Requirements

The application will have several key functionalities to support its operations. Users, including both customers and professionals, will be able to register with the system. The registration process will vary based on the user type, with professionals required to submit more detailed information for verification. The platform will provide a catalog of household services, where professionals can add, edit, or delete their services, and customers can filter these services based on categories, pricing, and location. Customers will be able to request services, which professionals can then accept or decline. Communication between customers and service providers will be facilitated through an integrated messaging system. After a service is completed, customers will be able to leave feedback and rate the service provider.

4. Technical Architecture

The technical architecture of the platform relies on a stack that ensures scalability, security, and ease of development. The backend is powered by Flask, a Python framework known for its flexibility and rapid development capabilities. PostgreSQL has been chosen for data storage due to its robustness and scalability. SQLAlchemy is used as the ORM to simplify database interactions. Security is a priority, with Flask-Login managing user sessions and Werkzeug handling password hashing and encryption. The application will be deployed on cloud platforms such as Heroku,

AWS, or DigitalOcean to ensure smooth scalability and maintenance.

5. Design Decisions and Rationale

The design of the application follows a modular architecture, which enables independent scaling of different features and simplifies maintenance. The relational database structure is ideal for managing complex data like user profiles, services, and transactions. Security is an essential consideration; hence, passwords are securely hashed using Werkzeug, and data transmission is encrypted to protect sensitive user information. The platform uses role-based access control to ensure that users can only access features relevant to their roles, such as admin, customer, or professional. Additionally, professionals are subject to a verification process that involves document submission, ensuring their credibility.

6. Detailed Feature Breakdown

The key features of the Household Service Application include user registration, professional verification, service management, booking and communication, and review and rating systems. The registration process for customers requires minimal details, while professionals must submit additional information for verification. The service catalog allows admins and professionals to manage service listings, ensuring accurate and up-to-date information. The booking system facilitates the request and acceptance/rejection of

services, while the communication interface ensures that customers and professionals can discuss requirements before finalizing bookings. After service completion, customers can leave ratings and feedback, helping to build a reputation management system for professionals.

7. Performance Optimization

Performance is a key consideration in the development of this platform. The use of SQLAlchemy ORM ensures that database queries are optimized, resulting in faster load times and better scalability. To enhance the application's performance, caching mechanisms are implemented for commonly accessed data, such as service listings and user profiles. The modular design of the platform ensures that different components of the system can scale independently, preventing any one feature from becoming a bottleneck when traffic increases.

8. Challenges and Solutions

Several technical challenges arose during the development of the project. One of the main challenges was ensuring the verification process for professionals was both secure and trustworthy. To solve this, a manual verification system was implemented, requiring professionals to submit identity and qualification documents. Another challenge was ensuring that search results were accurate

and relevant. This was addressed by designing an advanced search system with filters and sorting options. Additionally, safeguarding user data from unauthorized access was a priority, and security measures such as encrypted passwords and role-based access control were implemented to address this concern.

9. Project Metrics

The development of the Household Service Application was completed over an estimated period of 2 months. Approximately 2000 lines of code were written during this time, and the platform incorporates several core features, such as user registration, service booking, and a review system. Technologies used in the project include Flask, PostgreSQL, SQLAlchemy, and Werkzeug. The application was tested thoroughly to ensure that all features functioned as expected and that the platform was secure and scalable.

10. Conclusion

The Household Service Application provides an effective solution to the challenges of managing household services. By simplifying the process of discovering and booking services, ensuring trust through professional verification, and offering transparency in service pricing and quality, the platform delivers a comprehensive solution for both customers and service providers. The project not only meets the initial objectives but also lays the groundwork for future improvements, making it a scalable and sustainable platform.