<p style="text-align:center">Project Proposal: Express E-Station</p>

Title: Express E-Station

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1. Project Overview

Express E-Station is a community-based logistics management system designed to address the difficulty of accessing and storing express deliveries in communities, providing customers with more convenient express pickup services. The system consists of two parts: a Java web backend and a WeChat-based front-end mini-program. The core functions of this project include account login, express tracking, express storage management, and scanning for pickup, as well as the visualization of express data. The project will utilize technologies such as servlets, cloud servers, and HTML.

2. Project Details

Project Content

Our project demands the creation of a complete web application that has two main sections:

The Java Web-based management console operates as the back-end component to handle user and courier and package administration.

The WeChat mini-program interface enables users and couriers to perform registration while package tracking and code scanning functions for parcel pickup.

The system enables users to pick up parcels through scanning codes.

Project Significance

The actual demand: The user's pick-up of items is restricted by the working hours of the manual express delivery station, making it impossible for them to pick up items at any time. Additionally, when the express delivery personnel deliver items to the user's home and the user is not at home, they are unable to receive the items.

The system includes multiple technological integrations which include MVC framework alongside RESTful interfaces and Alibaba Cloud SMS service.

The system design allows future growth of smart lockers or Internet of Things (IoT) functionalities.

Project Objectives

Develop a fully functional management backend.

Realize the user/delivery person interaction interface on the WeChat end.

It has the functions of generating QR codes and verifying via text messages.

The system should provide safe identity authentication while protecting information along with ensuring express package security from theft and managing user access permissions.

Motivation

Apply Java Web and front-end development skills to practical scenarios. To address the inconvenience of picking up items.

Association with the existing system

Unlike traditional delivery systems, Express E-Station focuses on community-based solutions, but places more emphasis on low cost, high convenience and web-based ease of use. The difference from pure commercial platforms lies in its priority to meet the needs of local users.

Technical details

Back-end: Servlet, Filter, JSP, MySQL, MVC pattern.

Front-end: WeChat Mini Program (WXML/WXSS), AJAX interface calls. Third-party services: Alibaba Cloud SMS, layer.js UI component library

3. Core Functions

1.Administrator login/logout: Role-based security authentication.

2.Package management: Supports adding, deleting, modifying and viewing packages.

3.User/ Courier Management: The control of users by administrators.

4.Real-time data dashboard: Statistical display (total number of packages, number of packages awaiting pickup, etc.).

5.WeChat login / registration: SMS verification function for users / couriers.

6.QR code generation and scanning: Self-pickup function for users.

7.Package tracking: Users can check the logistics status by entering the tracking number.

8.Global filters: Encoding and security configuration.

9.API Design: RESTful interfaces for communication between the front end and back end.

10.Permission control classification: Different access permissions are set based on different roles (administrator/user/delivery person).

Additional functions to be realized

1.High concurrency and anti-attack capabilities: Support for a large number of users to access simultaneously, resist DDoS attacks and hacker behaviors such as SQL injection, and prevent system paralysis.

2.Data Encryption and Leakage Prevention: Full-chain encrypted transmission, sensitive data encrypted storage, and hierarchical permission management to prevent information leakage.

3.Smart Locker Security Alert: An alarm is triggered when a smart locker is illegally opened, and 24-hour monitoring is provided by networked cameras.

4.Cross-platform Compatibility: Compatible with mainstream browsers and devices, optimized for low-speed network usage, and compatible with low-performance devices.

5.Anti stagnation Intelligent Reminder: SMS notifications are automatically sent when items remain uncollected beyond the time limit.

4. Timeline

Weeks Task

Week 1: Build the backend foundation, complete the core processes of the MVC framework, and design the database tables and initialization.

Week 2: Build the management backend, including administrator login and logout, as well as basic express delivery management functions.

Week 3: Build the basic WeChat front-end, including user and courier registration and login, as well as the interface for querying express delivery numbers.

Week 4: Integrate core functions to achieve the capabilities of generating QR codes and scanning for package retrieval, as well as the integration with Alibaba Cloud SMS verification.

week 5: improvements were made to functional safety and optimization, and the permission control and basic stress testing were completed.

Week 6: Complete the system testing, test all functions and fix critical bugs.

Week 7: Preparation of materials for graduation design: Writing project documentation and organizing the code repository.

Week 8: Final Report Writing: Complete the first draft of the report.

Week 9: Presentation Preparation: Create PPT and rehearse the defense process.

Week 10: Finalization and Submission: Finalize the report, complete the result presentation, and submit all materials.

5. Challenges and Adaptability

QR code integration: Cross-platform compatibility issues need to be addressed.

SMS API cost: Most platforms have free quota limits, so alternative solutions may need to be sought. Scope management: Prioritize the completion of core functions to ensure the project is delivered on time.

6. References

Team Asana (March 7th, 2024), 6 Steps for Writing a Persuasive Project Proposal

Elizabeth Smith, How to Write a Proposal on Web Applications