

Criterion A

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1. Scenario

The client of the software is my mom, who owns a company that provides pneumatic logistics transfer system solutions for hospitals. The company needed a system to manage their employee's funding applications. Traditional solutions like paper request forms are time-consuming and hard to summarize and archive. While applying digital platforms could save lots of manpower and material resources.

I consulted with my mom about detailed demands. The requirements are clear. First is user-friendly. My software should truly improve their working efficiency and not require much employee training. Second is high usability, which allows managers to have access to the software system at any time and in any place. So, I planned to design and develop a user-friendly web application that includes two main parts – an employee portal and a manager portal. The employee portal allows employees to easily apply for funding by filling out an online form, attaching relevant receipts and other documentation, and submitting the request for review. The form is designed to capture all the necessary information and ensure that the request is complete and accurate, reducing the likelihood of errors and delays in processing. The management portal would gather information from employee portal. And there would be a sidebar that separates employees' submissions into pending and history. Moreover, there would be a side of employee list that records the brief information of each registered employee. And managers could add subordinates to the employee list.

2. Rationale

According to the client's requirements, I choose Python as the construction language. Python is a simple and efficient language. It has lots of third-party libraries and plain semantics, which could help programmers quickly implement their thoughts into real software. Then I apply Flask as the web framework. Flask is a lightweight framework for web application, which consists of one core and multiple extensions. Compared to another popular framework Django, Flask is more flexible and could realize specific functions with different extensions. In my software, it would use several

extensions. For example, Flask-SQLAlchemy and Flask-Migrate can be used to manage ORM (object-relational mapping) and connect with SQLite. Flask mail can be used to support email certification. I also consider solutions like template-based projects or PHP webpage development. For template-based solutions, though it may shorten the development period, it's hard to find the template that exactly satisfies my requirements. As for PHP, I have learned little about PHP, and I heard that this language could hardly support object orientation programs. To realize specific requirements and high scalability, I believe that Python and Flask are more suitable for development.

In detail, the whole system would be separated into front-end and back-end (database). I plan to implement the frontend with Vue JS, a lightweight yet powerful framework. To achieve requirements of user friendly, the frontend would be a single-page application. And the overall visual style should be concise. I decide to use blue and white as the main theme. As for the backend, I want to choose SQLite combined with Flask- SQLAlchemy. SQLite is a very light database, which could be deployed to pc, phones, cameras, and embedded systems. Moreover, it has relatively simple mechanism of data processing and querying, which improves my work efficiency and reduce the uncertainty while developing. It could be introduced to the project as an imported library. Though SQLite can hardly support high concurrency, such situation is very rare in my usage scenario. So, SQLite could find the balance between high performance and development agility, which is appropriate to my scenario.

3. Success Criteria

Financial Reimbursement System Work Flow Function	For managers	Managers can access the "Financial Reimbursement System" module to check the employee's reimbursement requests; By clicking on the employee's avatar, managers can view all the employee's historical reimbursement request records.
		Managers can approve the employee's reimbursement request in the "Financial Reimbursement System" module by clicking a button.
		Managers can reject the employee's reimbursement request in the "Financial Reimbursement System" module and add comments (e.g. why the request was rejected, what reimbursement documents are lacking, etc.)
	For employees	Employees can request reimbursement, which is required to fulfill the name of the reimbursement, the reimbursement amount, and the notes.

		Employees can add attachments which is optional (e.g. reimbursement request forms, invoice evidence, etc. required by the company's reimbursement process)
		Employees can access the "Application Status" module to check their requests status; they can also view all their historical reimbursement request records.
		If the requests are rejected by the manager, employees will be notified and they are able to adjust their previous request and resubmit in the "Application Status" module.
Sign-in system	Sign-in	Users can fill-in the username and the password.
		If the password or username is not correct, a "wrong" notification will pop up
	Sign-up (register)	Users can register by setting a username (email address) and entering a password twice.
	Forgot password	Users can reset their password through email verification
Information page	For managers	Managers will be shown a list of the employees and they can read employees' information forms by clicking the particular employee's icon.
		Managers can update their own portfolios by clicking on the avatar in the upper right corner.
	For employees	Employees can update their own portfolios by clicking on the avatar in the upper right corner.
User Experience Optimization	Security	When users enter passwords to log in, the passwords are displayed with multiple "*" instead.
		When a user registers for an account, the password is stored in the database in the form of a cipher text.
	Notification	When there is new information (e.g., application progress update, etc.), an alert message will appear on the home page.
		When loading, a progress bar should be shown to indicate that the application is working fine.

Table 1 Success Criteria

Word Count: 576