# System Design of EntreE

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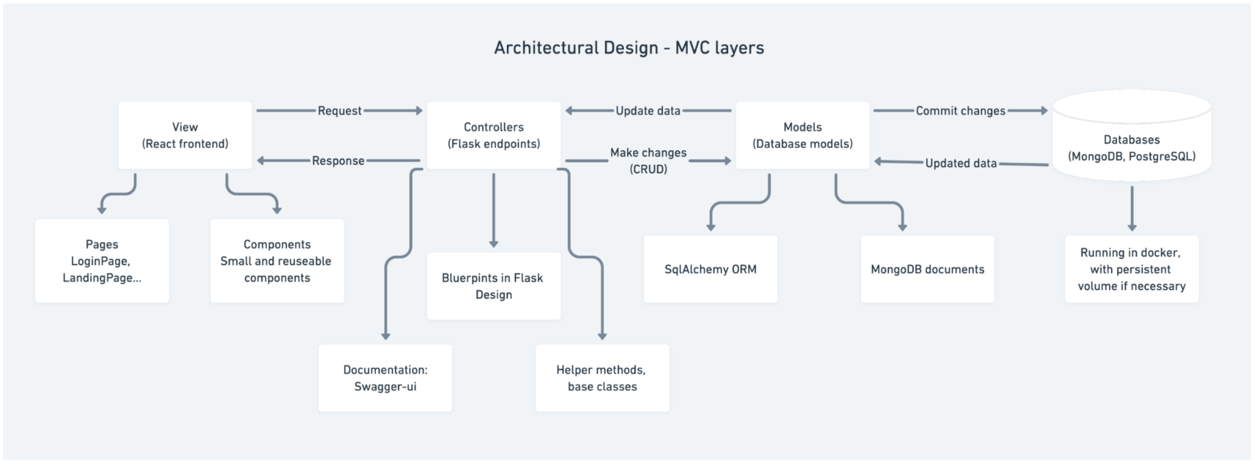
## System Design Architecture

The following diagram illustrates the architecture of our system and it makes use of the MVC layers design architecture.

- **M: Models layer**. We make use of a python library named SqlAlchemy to create models for different classes, for instance, the User class. It also represents the DAO class in the application since it handles all commits to the database. We may also want to use MongoDB in the future and it also contains methods for us to define models, they are called documents however. We separate files into two parts, components and pages and we write documentation in the code without using any third  party library.
- **V: View layer**. We choose React as our frontend framework and it is good for creating SPA and client-side rendering. It does not interact with the models directly but through the controllers, therefore, this architecture is considered as MVC layer instead of traditional MVC.
- **C: Controller layer**. We choose Flask as our backend framework and we make use of a module called flask_apispec to create RESTful APIs. It handles requests coming from the frontend and returns the requested data and a status code indicating the status of the request. For documentation, we use a famous library called swagger-ui and one can navigate to the backend url + /swagger-ui to check out a list of available endpoints including the request and response schemas.


Architectural Design - MVC layers
View (React frontend)
Request
Response
Controllers (Flask endpoints)
Update data
Make changes (CRUD)
Models (Database models)
Commit changes
Updated data
Databases (MongoDB, PostgreSQL)
Pages LoginPage, LandingPage...
Components Small and reuseable components
Bluerpints in Flask Design
SqlAlchemy ORM
MongoDB documents
Running in docker, with persistent volume if necessary
Documentation: Swagger-ui
Helper methods, base classes

## System Interaction

The following are information about the system interaction of our project

- Our project user interface is a webapp and therefore does not have any requirements about the user system. We are using the react framework and it has been tested on Safari, Firefox, Chrome and IE, all of the modern browsers should work.
- For the backend part we are using the flask framework which recommends the newest python version, Python 3.8+ and it will work on the majority of the systems including Windows, MacOS and so on.
- Docker will be required in order to successfully set up the databases at local
- For the database part we are using MongoDB and PostgreSQL through docker images so that we do not need to maintain the databases at local.

In developer perspective

- Frontend requirements:
    - Tools: Node, npm
    - Platform: Most of the modern browsers: Firefox, Chrome, IE
- Backend requirements:
    - Language: Python 3.8+
    - Platform: Majority of the systems including MacOS, Windows and so on
- Database requirements:
    - Tools: Docker
    - Others: openssl for PostgreSQL

## CRC Cards

The purpose of the CRC cards is to give a high level description of classes in the project. The following are some of the classes that we may need:

**Interface**: User
**Subclasses**: EntrepreneurUser, PartnerUser, CompanyUser
**Responsibility**: Representing a user, which is the essential part of our project

- Knows UserID
- Knows email
- Knows password (encrypted)
- Knows first name, last name
- Knows join datetime of joining the platform

**Class Name**: EntrepreneurUser
**Parent Class**: User
**Responsibility**: Representing an entrepreneurUser, one type of the user, implementation of User

**Class Name**: PartnerUser
**Parent Class**: User
**Responsibility**: Representing a partner, implementation of User

**Class Name**: CompanyUser
**Parent Class**: User
**Responsibility**: Representing a company, implementation of User

**Class Name:** Post
**Responsibility:** Representing a post

- Knows post tile
- Knows post content
- Knows post date
- Knows the user who posted it
- Knows a list of tags related with it

**Class Name:** JobPost
**Responsibility:** Representing a job post

- Knows job post title
- Knows job post description
- Knows job post requirements
- Knows job post company
- Knows job post location

**Class Name:** PostDAO
**Collaborators:** Post, User
**Responsibility:** Data access object for Post

- Create a Post for the user
- Get all posts posted by the user
- Delete posts posted by the user

**Class Name:** JobPostDAO
**Collaborators:** JobPost, User
**Responsibility:** Data access object for JobPost

- Create a Job Post for the user
- Get all job posts posted by the user
- Delete job posts posted by the user

**Interface**: UserDAO
**Collaborators**: User
**Responsibility**: Data access object for User and have access to the database, perform CRUD operations here

- Create a user, given first name, last name, email and password
- Get an user by its UserID
- Change password
- Given an user, tell if it is either a EntrepreneurUser, PartnerUser or CompanyUser

**Class Name**: UnAuthPage
**Subclasses**: LandingPage, LoginPage, SignupPage
**Responsibility:** A fixed header at top to let users that are not signed in yet to navigate between pages

**Class Name:** LandingPage

**Collaborators:** LoginPage, SignupPage
**Responsibility:** Provide general information about the platform

- Knows information to display
- Has Login button
- Has Signup button
- Clicking login and redirect user to the LoginPage
- Clicking Signup and redirect user to the SignupPage

**Class Name:** LoginPage
**Collaborators**: ForgotPasswordPage
**Responsibility:** A form asking for email and password

- A field to let user enter email
- A field to let user enter password
- A link with the label "Forgot your password?" and clicking it will redirect user to the ForgotPasswordPage

**Class Name:** SingupPage
**Collaborators:** DashboardPage
**Responsibility:** A form asking for first name, last name, email and password

- A field to let user enter first name
- A field to let user enter last name
- A field to let user enter email
- A field to let user enter password
- A button with the label "Create Account" and clicking it will send the request to the backend, if success, redirect user to the DashboardPage

**Class Name:** DashboardPage
**Collaborators:** PostComponent, JobPostComponent, SendPostComponent
**Responsibility:** Display everything related to the user on the dashboard

- A post component to show recent posts
- A job post component to show recent job posts
- A send post component to send post

**Class Name:** PostComponent
**Collaborators:** DashboardPage
**Responsibility:** Show recent posts or all posts or filtered posts

- Knows post title
- Knows post date
- Knows poster
- Knows post image
- Knows post content
- Knows post comments
- Knows post likes

**Class Name:** JobPostComponent
**Collaborators:** DashboardComponent
**Responsibility:** Show recent job posts or all posts or filtered posts

- Knows job title
- Knows company
- Knows location
- Knows job description
- Knows job requirements
- Knows job image

**Class Name:** SendPostComponent
**Collaborators:** DashboardPage
**Responsibility:** Allow users to send post

- A field to let user enter post title (required)
- A field to let user enter post content
- A button to let user select images