COMP9900 Information Technology Project

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Project Proposal

Group name: Salted-fish

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Table of Contents

Background

In recent years, people tend to spend much more time on the internet than ever before due to the fast growth of information technology. Except ordering food, purchasing, online banking or online stock trading, online advertising, recruiting and project collaborating with the others also become more and more popular.

There are people with dreams and ideas for new projects, and there are people with proper technical skills, knowing how to turn those dreams into a reality, and occasionally there are those who can do both. Therefore, it is very necessary to provide a cyberspace where both dreamer and collaborators can register, visit, share and match their thoughts. Dreamers are able to post advertisements about their ideas and projects to attract those individuals who are interested in and have proper experience to collaborate for the project, and then turn these ideas into a reality.

We have visits some websites which are trying to achieve this objective. However, the efficiency of these websites is not high enough. Basically, the recommendation system for these websites is mostly based on the topics the users might be interested in rather than the real requirements of the projects and the collaborators' education, skill or experience, which means the recommendation content might be seems a lot, but not what the users really can do or want to do based on their education, skill and working experience. To some extent, this recommendation is kind of waste and it's not really helpful during the process of making a quick and proper matching between the dreamer's project and collaborators. Furthermore, we found that in current existing system there is only recommendation related to the projects and no prospective collaborators recommendation, which means that when a dreamer advertised a project and he or she can do nothing except waiting for the collaborators joining in, and this kind of mechanic is absolutely not efficient at all. As a dreamer, I definitely want to have get a list of potential collaborator in which the collaborators are satisfying the requirements of my projects to some extent, then the dreamers can invite their preferred collaborators more actively and flexibly and complete team recruiting for the project more efficiently.

Therefore, we'd like to create our own Dream MatchMaker system, which is going to build a professional website to provide a virtual space for both dreamers and collaborators to find their ideal team and members more actively, flexibly and efficiently.

Objectives

In the Dream MatchMaker website, there are 2 identity roles available during registration: dreamer and collaborator.

As dreamers, firstly, they are able to advertise a project with details about what kinds of roles and specific skills and experiences required. They can view the details of the projects that they have posted and update their project details if they need to make any changes. Dreamers also obtain the right to mark their projects as preparing, in progress or finished once they believe they have achieved a stage or their final goals.

Secondly, dreamers can receive all the applications from prospective collaborators who are willing to join the project. After making a decision of a preferred applicant for a role, dreamers have the access to add the collaborator in a particular role of the project.

Thirdly, the dreamer is able to see all the questions about the project he advertised from potential collaborators and provide corresponding responses or answers to a particular question.

As collaborators, firstly, they are able to view all available projects. At the same time, they can search for a particular category of projects which they are interested in. Secondly, collaborators can apply for a role of the project which they meet the specific requirements or they are really interested in it. Thirdly, collaborators could raise questions about the project if they'd like to do a deeper communication with the dreamer, get more detail of the project or if they have concerns about it.

Last but not least, collaborators can follow the projects they are interested in, and unfollow them if they do not want to any more.

Except that, the Dream MatchMaker website will provide the recommendation function for both dreams and collaborators. If you log in as a dreamer and own some projects, the system will automatically provide a list of collaborators who are to some extent matching with some of the requirements about your projects, furthermore, dreamers can send an invitation to some collaborators to join the projects based the recommendation list. Similarly, if you log in as a collaborator, the system will recommend you a list of projects you might be interested in based on the information of your education degree, skills and experiences you have provided in your profile. Also you can receive the invitations from some dreamers to join in a project or decline it.

There will be a statistic function for both dreamers and collaborators. Based the number of projects which the dreamer has competed or the collaborator have collaborated with, a statistic

information will be given and will be used as one of the dimensions considered in recommendation process.

A locating function will be included based on the location of the project provided by dreamer, which is visible for all users and provides more options for both dreamer and collaborators if they want to meet offline regarding their projects.

Besides dreamers and collaborators, there is a third role - administrators. Obviously, administrators have the super access to this site and are responsible for the daily administration routines and site maintenance management. Administrators are also playing an important role to audit all advertisements of the projects posted by dreamers.

User Stories and Sprints

Sprints

[S1] Sprint 1: Week 4~5 (before lab) Date: 22 June - 1 July

[S2] Sprint 2: Week 5~6 Date: 2 July - 12 July

[S3] Sprint 3: week 7~8 (before lab) Date: 13 July - 22 July

[S4] Sprint 4: week 8~9 Date: 23 July - 31 July

User Stories

1. [S1] As an administrator, I have full access to this website.
2. [S1] As a dreamer, I want to register as a dreamer so I can have full dreamer functionality access.
3. [S1] As a collaborator, I want to register as collaborator so I can have full collaborator functionality access.
4. [S1] As a dreamer, I want to advertise a new project so I can start to find collaborators for my project.
5. [S1] As a dreamer, I want to add skill/education/experience limit to a specific role of the project so I can find more suitable collaborators.
6. [S1] As a collaborator, I want to view all projects so I can find the project suits me.
7. [S1] As a collaborator, I want to view projects suitable for my education, skill and experience so I can find potential projects I can attend.
8. [S1]As a collaborator, I want to view the related projects when I search for a particular category of projects which is fitting my education and skills etc.

9. [S2] As a collaborator, I want to apply for a role in a specific project so I can join in a project.

10. [S2] As a dreamer, I want to view applications for each role so I can decide which applicant I want to fill the role.

11. [S2] As a dreamer, I can add one applicant to one role of my project.

12. [S2] As a collaborator, I want to receive notifications through email when my application has been acknowledged and the project owner offers me a role.

13. [S2] As a dreamer, I want to see some recommendations of collaborators who may be suitable for my project so I can save some time and directly contact them.

14. [S2] As a dreamer, I want to invite some collaborators based on the collaborator recommendation, so I can compete my team recruiting more actively and efficiently.

15. [S2] As a collaborator, I want to see some recommendations of projects that suit me so I can save some time searching and directly view the projects I might be interested in.

16. [S2] As a collaborator, I can receive an invitation from a dreamer for some projects, and I can take the invitation to join the project or decline the invitation if I do not interested in, so I can have more chance to join in some projects.

17. [S2] As a dreamer, I want to remove or edit a role when needed to make it more suitable for my plan or fix my accidently wrong operation.

18. [S2] As a dreamer, the system will show the statistic info based on the projects I have finished.

19. [S2] As a collaborator, the system will show the statistic info based on the projects I have collaborated with.

20. [S3] As a dreamer, I want to edit/update my project information so I can make it more clearly for viewers or if there are some updates needed.

21. [S3] As a collaborator, I want to follow or unfollow a project so I can receive or stop receiving related updates of the project.

22. [S3] As a dreamer, I can mark my project as finished when it's ended.

23. [S3] As a collaborator, I want to ask questions or discuss one particular topic with dreamer about the project so I can know more about the project.

24. [S3] As a dreamer, I want to reply questions or discuss one particular topic with the collaborators about the project, so I can share more detail info with potential collaborators.

25. [S3] As a dreamer, I can view all the discussion about my projects.

26. [S3] As a collaborator I can view all the discussions about the project I followed.

27. [S4] As an administrator, I want to be able to hide unsuitable projects so the site will be kept clear.

28. [S4] As a dreamer, I want to receive notifications when my project has been hidden so I can update it.

29. [S4] As a dreamer, I want to edit a project that has been hidden so I can make it proper to the site.

30. [S4] As an administrator, I want to unhide a proper project after editing so it will be visible again.

31. [S4] As a dreamer, I want to share my general location on the project page to attract collaborators near me for easier face to face meetings or start the project offline.

32. [S4] As a collaborator, I want to see the location of project owners to find projects near me for easier face to face meetings.

33. [S4] As a collaborator, I want to search for projects based on location.

34. [S4] As a user, I want to link my account with google account for easier login.

Sprint 1 8 issues

Register, login, project advertise, project search. 22 June - 1 July

[Start sprint] [Plan sprint ▼] [•••]

📑 As a dreamer, I want to register as a dreamer so I can have full dreamer functionality access.	SF-2 ↑	-
📑 As a collaborator, I want to register as collaborator so I can have full collaborator functionality access.	SF-3 ↑	-
📑 As an administrator, I have full access to this website.	SF-1 ↑	-
📑 As a dreamer, I want to advertise a new project so I can start to find collaborators for my project.	SF-4 ↑	-
📑 As a dreamer, I want to add skill/education/experience limit to a specific role so I can find more suitable collaborators.	SF-5 ↑	-
📑 As a collaborator, I want to view all projects within specific topics so I can find the project suits me.	SF-6 ↑	-
📑 As a collaborator, I want to view projects suitable for my education/skill/experience so I can find potential projects I can attend.	SF-7 ↑	-
📑 As a collaborator, I want to view the related projects when I search for a particular category of projects which is fitting my education and skills etc.	SF-8 ↑	-

Sprint 2 11 issues

Roles, applications, basic recommendations. 2 July - 12 July

[Plan sprint ▼] [•••]

📗 As a collaborator, I want to apply for a role in a specific project so I can join in a project.	SF-25 ↑	-
📗 As a dreamer, I want to view applicants for each role so I can decide which applicant I want to fill the role.	SF-26 ↑	-
📗 As a dreamer, I can add one applicant to one role of my project.	SF-27 ↑	-
📗 As a collaborator, I want to receive notifications through email when my application has been acknowledged and the project owner offers me a role.	SF-28 ↑	-
📗 As a dreamer, I want to see some recommendations of collaborators who may be suitable for my project so I can save some time and directly contact them.	SF-29 ↑	-
📗 As a collaborator, I want to see some recommendations of projects that suit me so I can save some time searching and directly view the projects I might be interested in.	SF-30 ↑	-
📗 As a dreamer, I want to remove or edit a role when needed to make it more suitable for my plan or fix my accidently wrong operation.	SF-31 ↑	-
📗 As a dreamer, the system will show the statistic info based on the projects I have finished.	SF-47 ↑	-
📗 As a collaborator, the system will show the statistic info based on the projects I have collaborated with.	SF-48 ↑	-
📗 As a dreamer, I want to invite some collaborators based the collaborators recommendation, so I can compete my team recruiting more actively and efficiently	SF-49 ↑	-
📗 As a collaborator, I can receive an invitation from a dreamer for some projects, and I can take the invitation to join the project or decline the invitation if I do not interested in, so I can have more chance to join in some p SF-50 ↑	-

Sprint 3 7 issues

Update, notification, discuss. 13 July - 22 July

[Plan sprint ▼] [•••]

📗 As a dreamer, I want to edit/update my project information so I can make it more clear for viewers or if there are some updates needed.	SF-32 ↑	-
📗 As a collaborator, I want to follow or unfollow a project so I can receive or stop receiving related updates of the project.	SF-33 ↑	-
📗 As a dreamer, I can mark my project as finished when it's ended.	SF-34 ↑	-
📗 As a collaborator, I want to ask questions or discuss one particular topic with dreamer about the project so I can know more about the project.	SF-35 ↑	-
📗 As a dreamer, I want to reply questions or discuss one particular topic with the collaborators about the project to assist with the application.	SF-36 ↑	-
📗 As a dreamer, I can view all the discussion about my projects.	SF-37 ↑	-
📗 As a collaborator I can view all the discussions about the project I followed.	SF-38 ↑	-

Sprint 4 8 issues

Admin, management, location service, OAuth. 23 July - 31 July

[Plan sprint ▼] [•••]

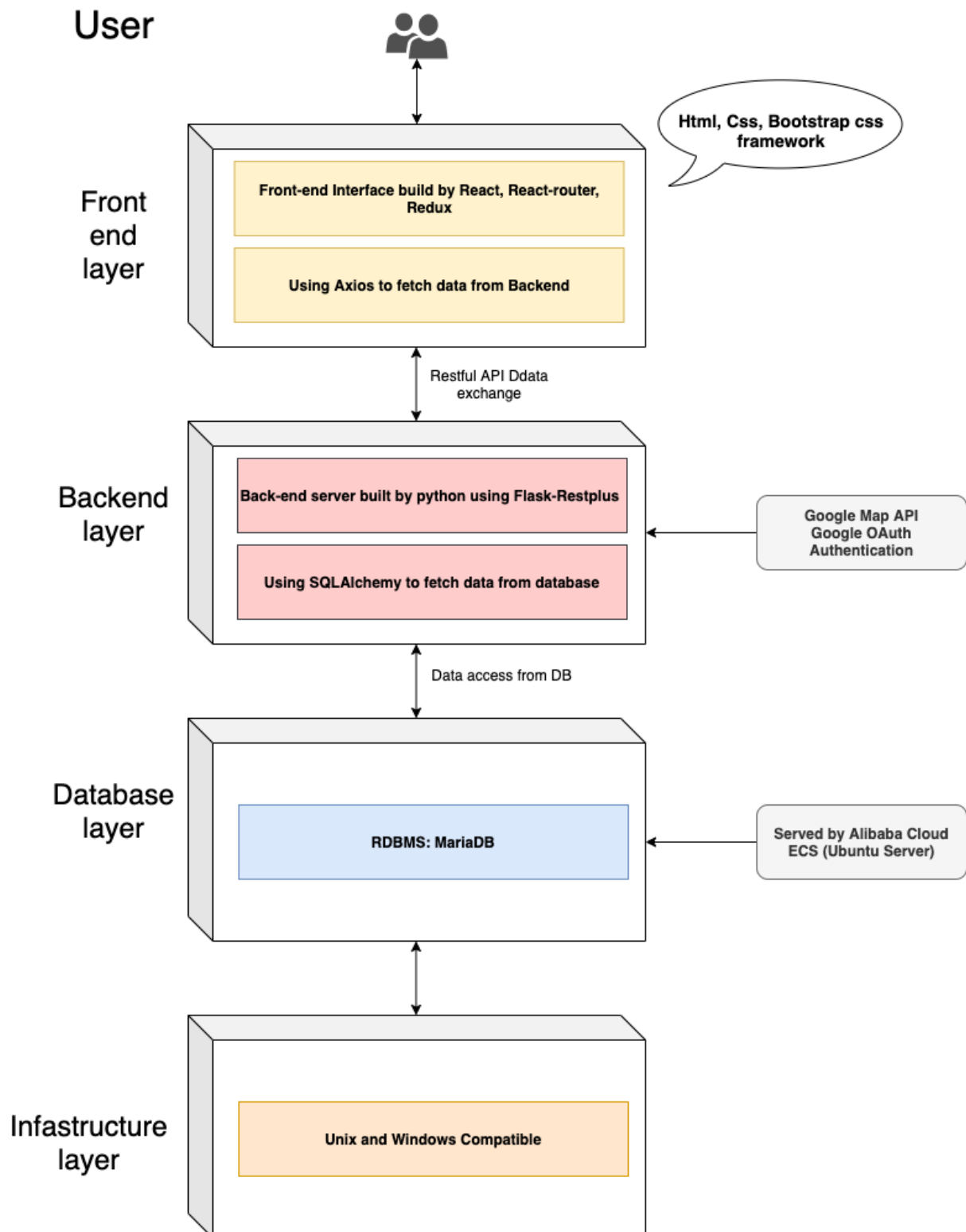|		
📗 As an administrator, I want to be able to hide unsuitable projects so the site will be kept clear.	SF-39 ↑	-
📗 As a dreamer, I want to receive notifications when my project has been hidden so I can update it.	SF-40 ↑	-
📗 As a dreamer, I want to edit a project that has been hidden so I can make it proper to the site.	SF-41 ↑	-
📗 As an administrator, I want to unhide a proper project after editing so it will be visible again.	SF-42 ↑	-
📗 As a dreamer, I want to share my general location on the project page to attract collaborators near me for easier face to face meetings.	SF-43 ↑	-
📗 As a collaborator, I want to see the location of project owners to find projects near me for easier face to face meetings.	SF-44 ↑	-
📗 As a collaborator, I want to search for projects based on location.	SF-45 ↑	-
📗 As a user, I want to link my account with google account for easier login.	SF-46 ↑	-

User Story Analysis

1. The dreamers have the access to post, view, update and finish a project, which can be satisfied by the related user story 2, 4, 5, 15, 20, 22, 29 and 34. Furthermore, the dreamers can view all the applications from collaborators and feed one role with a preferred collaborator for the project, these functions are satisfied by user story 10, 11. All these functions are part of primary requirements of the Dream MatchMaker site.

2. The collaborators have the access to view projects or search a given category of projects, apply a role of a particular project, which can be satisfied by user story 3, 6, 7, 8, 9, 12 and 34. They are part of primary requirements of the Dream MatchMaker site.

3. One important and novel feature of this system is the recommendation function for both dreamer and collaborator. Based on the different identities logged in, if you are dreamer, the system will automatically provide you a list of collaborators who are to some extent matching with the requirements about dreamers' projects, furthermore, dreamers can send an invitation to some collaborators to join the projects based the recommendation list. On the other hand, if you are a collaborator, the system will recommend a list of projects that you might be interested in based on your profile and education background. Also, collaborators can receive the invitations from dreams for some projects and they can accept the offer or decline them. These functions will be satisfied by user story 13, 14, 15 and 16, and obviously, these recommendation functions will be beneficial for both dreamers and collaborators and help save their time and energy during the matching process and team recruiting phase.

4. One more special feature of this site is that there will be a Q&A function for the project. Especially as a collaborator, there might be some questions, concerns or some detailed queries regarding a specific project before the collaborators are going to apply one of the roles. Similarly, to attract the perfect collaborators to join in the projects, dreamers would like to share more info about the projects especially what collaborators care about. Therefore, It's a good design to have the Q&A function which will be a great place for dreamers and collaborators to communicate with each other, improve the info interact ability between users and provide more detailed information about the project for all other users to some extent. These functions will be met through user story 23, 24, 25 and 26.

5. Another popular feature added in this system is the subscription function. Once dreamers or collaborators can follow one or more projects which they are interested in, they will

receive notifications once there are any updates about the projects or any questions or answers raised, then subscribers will get the latest news or updates as soon as they log in the system. Of course if you unfollow one or more projects, you will not receive such notifications any more. These functions will be satisfied by user story 21 and 26.

6. A novel functionality compared with the existing systems, the system will include a statistic function, which will provide statistical information based on the number of projects dreamer has completed or the number of projects collaborator has collaborated with. Furthermore such statistic information will be used as one of the dimensions considered during the recommendation process. This function will be satisfied by user story 18 and 19.

7. Another novel functionality is the locating function based on the location of the project provided by dreamer, which is visible for all users and provides more options for both dreamer and collaborators if they want to meet offline regarding their projects or start their projects offline. And this function will be satisfied by user story 31, 32 and 33.

8. We also add a new feature which is related to the administrator role. In the system, except the maintenance and system management access, administrators also play a role in auditing projects to avoid any illegal or improper contents in the projects advertisement posted by dreamers. This feature is satisfied by user story 1, 27 and 30.

System Architecture

Related Technology

Test environment for server: Alibaba Cloud ECS, Ubuntu 18.04.2 LTS.

The environment (infrastructure layer) is used for progress demo and final deployment. The product is designed to be compatible across Unix and Windows for deployment and using. We are using Linux server for better database performance during testing and demo.

Server side database: MariaDB 10.4.12.

We are tending to use relational database system for all our data storage. Towards ease of use, compatibility and performance, we chose MariaDB as database management system. MariaDB has almost same functionality and commands as MySQL with more performance improvement.

Programming language: Python, MySQL, JavaScript

As previously stated, MariaDB DBMS is using almost same commands as MySQL DBMS. For easier development and compatible with original MySQL deployment of project, we use MySQL as our database programming language.

Python is an easy-to-use, flexible and extensible programming language. It also naturally provides compatibility through Unix and Windows environment. For the project, we are using Python as the main programming language in business layer, and utilize several libraries from PyPI.

JavaScript is the most commonly used frontend script language which provides a lot of dynamic functionalities on top of html. We are using JavaScript as our main frontend programming language with React framework. The reason why we choose React is that it can significantly improve the performance of the modern websites and largely reduce the amount of code. As for Bootstrap CSS framework, it can provide us to implement the responsible website which suits different sizes of screen in different media.

Libraries and frameworks: Flask-Restplus, SQLAlchemy, smtplib, React, Redux, Bootstrap

For the backend, we are using Python library Flask and its module Flask-Restplus in business layer to develop a restful API backend. SQLAlchemy will provide database connection functions in python programming. Smtplib will provide a SMTP based email sending system for our project.

For the frontend (interface layer), we are using React, Redux and Bootstrap for frontend framework, data binding, page design, etc.

Third party APIs: Google Map API, Google OAuth 2.0

We will use Google Map and OAuth as our project extension functions. Google Map API, as a most commonly used map API, will provide easy-to-use location sharing service. Google OAuth can make the login easier for users - after they bind the account, they are able to login without inputting username/email and password every time.

Version control: Git, Github

Git will be used for out development version control, as well as the original deployment method - clone and deploy. Our git repo is hosted on Github.

Project management: Jira, Github Project Board

We are using Jira as scrum project management system. User stories, tasks will be recorded on Jira. The tasks will also be listed on Github project board for easier development progress tracking.

Group Management

Daily Standup: Through Jira, Github Project and WeChat

We will report the progress in the team every day to ensure we are on track of the project.

Weekly Video Meeting: In lab (through BB Colab), Zoom meeting (Time TBD, once per week at least)

The weekly meeting will ensure we meet our goal, and provide a good place for us to evaluate, modify and stick to the plan.

Interface and Flow Diagram

First of all, all visitors can view the index page without logging in.

There is a single page designed for administrators to do system maintenance and audit the new projects created by dreamers.

Then after registering and signing in, there are two corresponding dashboards for dreamer and collaborators, except the notifications from other users, collaborator recommendation list and my projects list for dreamers and project recommendation list for collaborators will be provided separately based on their identity roles.

Following that through creating a new project or updating an existing project, dreamers can get to the project page where project details can be edited, like adding a new role or updating one role info through a new pop-up page.

On the other hand, collaborators can view one project based on the project recommendation list, and further to apply one role of a project through another pop-up page for conformation.

From the project page both dreamer and collaborators can access a discussion board, which is a platform where they can communicate with each other on project detail.