

1. Introduction

1.1. Project Background

When finding an internship or a job, the youth are facing the circumstances to write CVs. Companies also treat CVs as an important part of recruitment because CVs are the intermediate for them so choose potential staff.

CV, short for curriculum vitae, is a document that sells a person to prospective employers. It introduces the professional history, skills, abilities and achievements of the person for the employers. Traditionally, CVs are just one or two pages long with summary statements in text format. Some posts will require an additional portfolio as a reference. Generally speaking, CVs should highlight why the person is suitable for the post.

Nowadays, with the popularization of computers in daily life, resumes are required to be sent through the internet. Due to the COVID19 pandemic, organizations tried to reduce offline contacting, more of the recruitment process is moving to the online form. More HRs like to search for potential candidates online and collect resumes online. Some HRs stated that although the traditional form of CV seems boring, it is still the quickest and most efficient way for HRs to know a candidate. They can get an overview of a person through traditional CVs and then decide whether to have further contact.

Collecting CVs and additional information online is the trend of official works. More companies will develop this method so the youth need to learn to sell themselves online. Thus, it will be important to have platforms to make online CVs.

1.2. Problem / Improvement Areas

1. The youth lack experience in writing CVs

The youth may lack experience in writing CVs. Some students do not know how to arrange content in an effective way in CVs which may influence their chances of getting internships and jobs. Beginners need some CV templates to obtain some inspiration for writing CVs.

2. It is time-consuming to create CVs with different styles

It is inefficient to manage the CV contents if the web system cannot save the input information since the youth need to adjust their CVs for different posts frequently. It takes time to create a new CV or make modifications to the template style. If the youth wish to change the section arrangements or their CV contents, they may need to input the information repeatedly. Thus, having a system that can store all the information is necessary.

3. There are no real-time tips

There are some articles about how to write a CV, but the articles contain too much information. Readers need to look for the corresponding sections and compare them to check, which is very inconvenient. If a person with little writing skills needs to produce a CV in a short time, the person may ignore the tips.

1.3. Proposed Solution

This is an online CV platform for users to create CVs and share CVs online. Others can access the CVs as long as there is an internet connection. This may be more convenient for users to update their CVs and HRs can collect CVs more efficiently.

When using the system for the first time, users need to register for the system. After reading the general instruction, the users can create CVs of their own.

The website is designed with functions according to the common process of writing a CV. Users need to input contact information, education experience, work/internship experience, activity experience and references first. Then, the system will generate the preview section for users to choose a suitable template.

Users who lack writing experience may input unnecessary information and cannot find the focus. The system will provide guidelines and writing tips for users to know what to include for reference in each section. Users can input information according to instructions and polish their content after reading the tips.

After confirming the CV style, the website will generate a permanent link to the CV. The user can share the link with others. Others can visit the CV through the link and download the CV in pdf form. If they wish to contact the candidate, they simply click on the contact button to send an email for the user. If the CV is not needed anymore, the user can delete the CV.

A general CV is not able to suit all posts. Modifying CVs for the different posts is important for searching for jobs. The system allows each user to create multiple CVs for different purposes. Users can enter the management page and view all the CVs they created and update information frequently.

2. Project Plan

2.1. Resource Implications

Hardware

Type	Item
Model	MacBook Pro
CPU	Apple M1
RAM	16G
Hard Dis Storage	494GB
Operating System	macOS

Software

Type	Item
Plateform	Node.js
Framework	Sails.js
Code editor	Visual Studio Code
Operating system	macOS
Browser	Google Chrome
Programming language	HTML, CSS, JavaScript

2.2. Development & Operating Costs

One time items:

Item	Unit Price (HKD)	Quantity	Total Cost (HKD)	Remark
MacBook Pro	\$11,499	1	\$11,499	
Git	0	1	0	
Node.js	0	1	0	
Sails.js	0	1	0	
Visual Studio code	0	1	0	
		Total	\$11,499	

Operating (one year):

Item	Unit Price (HKD)	Quantity	Total Cost (HKD)	Remark
Domain registration	\$99/year	1	\$99/year	
Server	\$1,200/month	12	\$14,400/year	
Maintenance	\$1,200	1	\$1,200	
		Total	\$15,699	

2.3. Tangible and Intangible Benefits

2.3.1. Tangible Benefits

2.3.1.1. Having more chances to get invitations from recruiters

This online CV system helps users to make good CVs. Users can learn how to write good CVs and apply the skills when writing their own ones. With a more clear focus and more skilful ways to present themselves, the CVs may attract more recruiters to get in touch with the user.

2.3.1.2. Shortening the time to make a CV

This system gives tips and examples so users can save the time of looking for guidelines by following the examples provided by the system.

This system provides the standard templates and applies the formatting process automatically so the users do not need to spend time adjusting the format one by one. There is no need for the users to design the style of the CV and think about how to arrange the pages as well. Some personally designed pages may not be preferred by recruiters so this system may help the users to gain higher chances of interview invitations.

This system can be used conveniently so the user does not have to buy other tutorials and CV templates.

2.3.1.3. Improving recruiting efficiency

The CV can be accessed by anyone with the link so it can be easily found by recruiters. Recruiters can access the CVs through the link, download the CV and send the email to the person by one click. It saves time of printing out the CVs and dealing with physical papers, so it helps recruiters to improve the working efficiency.

2.3.2. Intangible Benefits

This system helps the users to build a CV archive that they can refer to at any time.

It is common for one person to have different CVs with different contents at the same time for different positions. This system helps the users to have a summary of their CVs and they do not need to worry about losing the records. The users can update their CVs easily when needed.

2.4. Cost-Benefits Analysis

2.4.1. Cost

Non-recurrent Item	Year1	Year2	Year3	Year 4	Year 5	Total
Hardware	\$12,000	0	0	0	0	\$12,000
Software	\$0	\$0	\$0	\$0	\$0	\$0
Site Lease	\$14,499	\$14,499	\$14,499	\$14,499	\$14,499	\$72,495
User Trainng	\$1,000	\$1,000	\$1,500	\$1,500	\$1,500	\$6,500
Contingency	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$10,000
					Total	\$100,995

Recurrent Item	Year1	Year2	Year3	Year 4	Year 5	Total
Hardware and Software Mantainance	\$1,000	\$2,000	\$2,500	\$3,000	\$3,000	\$11,500
IT Staff Salary	\$108,000	\$108,000	\$110,400	\$110,400	\$114,000	\$550,800
Admin Work Cost	\$36,000	\$36,000	\$37,200	\$37,200	\$38,400	\$147,600
					Total	\$709.900

Total cost (\$HKD):810,895

2.4.2. Benefit

2.4.2.1. Revenue

Item	Year1	Year2	Year3	Year 4	Year 5	Total
Business Advertisement	\$0	\$50,000	\$80,000	\$100,000	\$120,000	\$350,000
					Total	\$350,000

2.4.2.2. Savings

Item	Year1	Year2	Year3	Year 4	Year 5	Total
Efficiency Saving	\$10,000	\$12,000	\$15,000	\$15,000	\$15,000	\$67,000
Human Resource Saving	\$120,000	\$120,000	\$126,000	\$126,000	\$132,000	\$504,000
					Total	\$571,000

Total benefit (HKD):921,000

Net Saving (HKD):110,105

2.5. Development Schedule

	2021					2022			
	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Requirements									
System Analysis									
System Design									
System Development									
Testing									
Deployment									
Documentation									

2.6. Cost Estimation

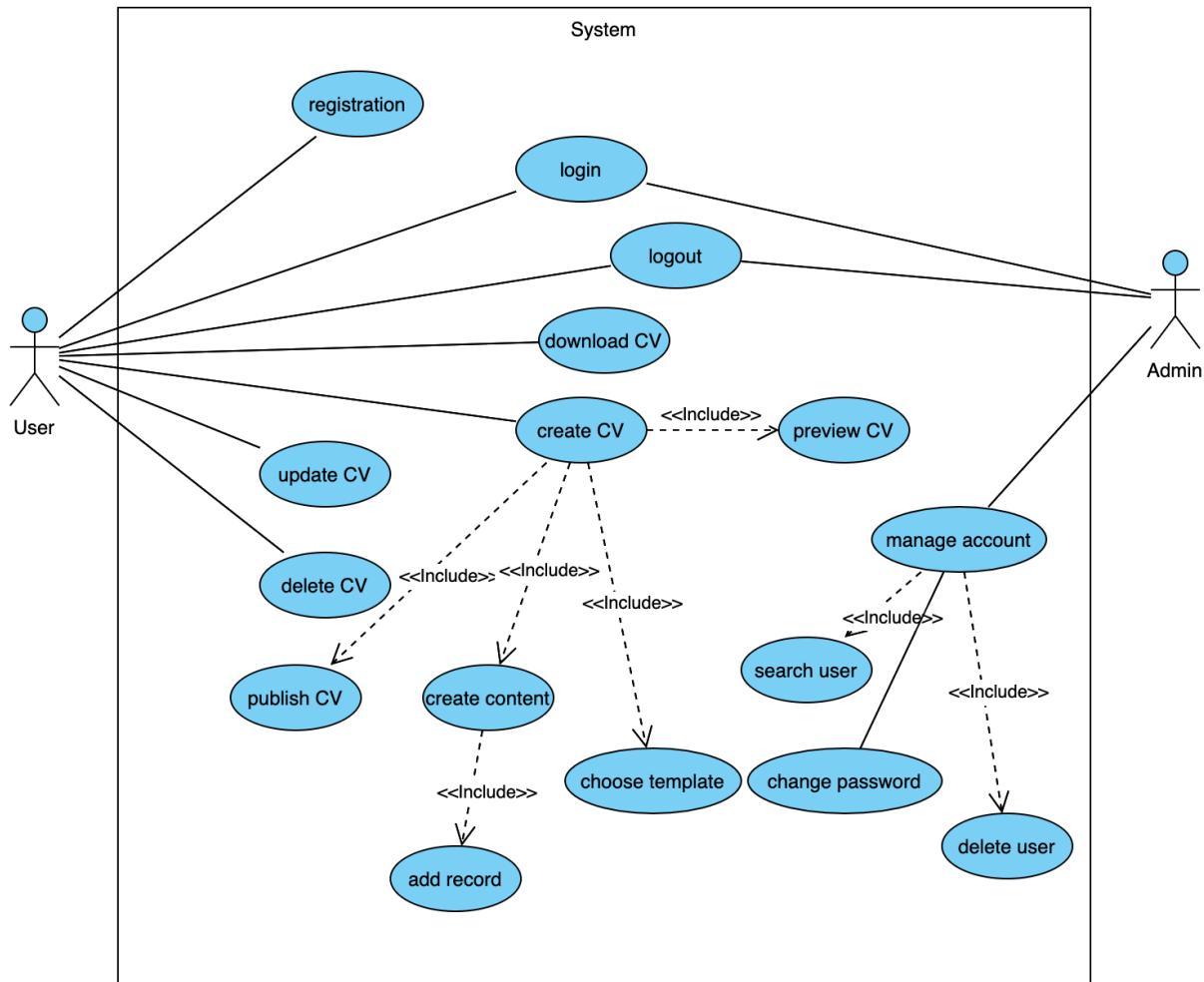
Non-recurrent Item	Year1	Year2	Year3	Year 4	Year 5	Total
Hardware	\$12,000	\$0	\$0	\$0	\$0	\$12,000
Software	\$0	\$0	\$0	\$0	\$0	\$0
Wite implementation	\$14,499	\$14,499	\$14,499	\$14,499	\$14,499	\$72,495
User Trainng	\$1,000	\$1,000	\$1,500	\$1,500	\$1,500	\$6,500
Contingency	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$10,000
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Total cost (\$HKD):810,895

3. System Analysis

3.1. Use Case Model



This CV system has two types of roles: user and admin.

Creating and managing CV are personal actions, thus this system requires registration to save the data of users. When registering, the user needs to use an email address as the account and inputs username, mobile number and password. The system will grade the security of the password. If the password is too weak, the system will show a red bar to inform the user to change to a more complex one.

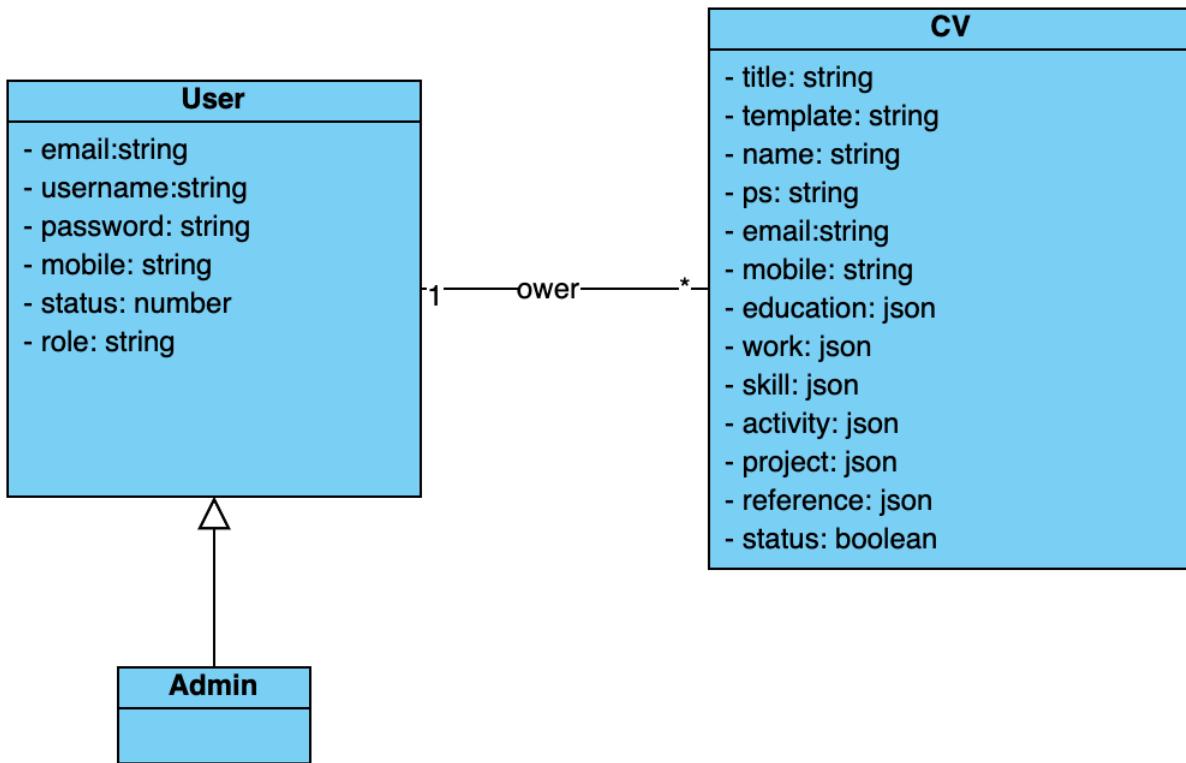
When users wish to use this system, they need to log in. After login, the user can create new CVs and manage preview CVs.

To create a new CV, the user needs to give the CV a name and then input content according to instructions. The system requires users to input contact information, education experience, work/internship experience, activity experience, skills and reference by default. However, if the user thinks one section is unnecessary, the user can skip that section. After adding all the contents, the user can preview the CV with a different template and choose the one that fits the need best. If the user thinks the contents of the CV need to be modified, the user can enter the edit page to update information.

After confirming the content and template of the CV, the system will save it and others can view the CV through the link. If the user wishes to update the content, the user can go to the edition page and update the information. When the CV is no longer needed, the user can delete it.

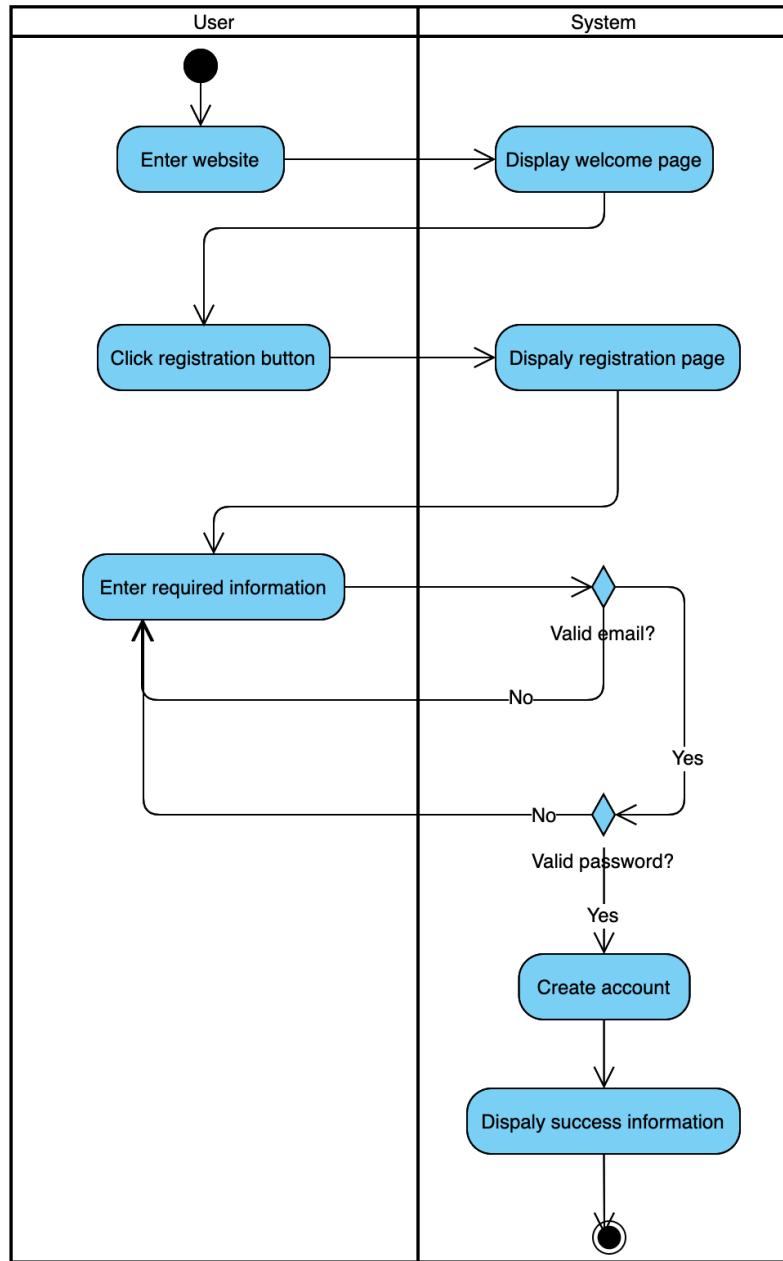
Admins are in charge of the system. Admins can view users in the system, delete accounts and view CVs of all the users. They can also help the users to change password.

3.2. Class diagrams (with attributes only)



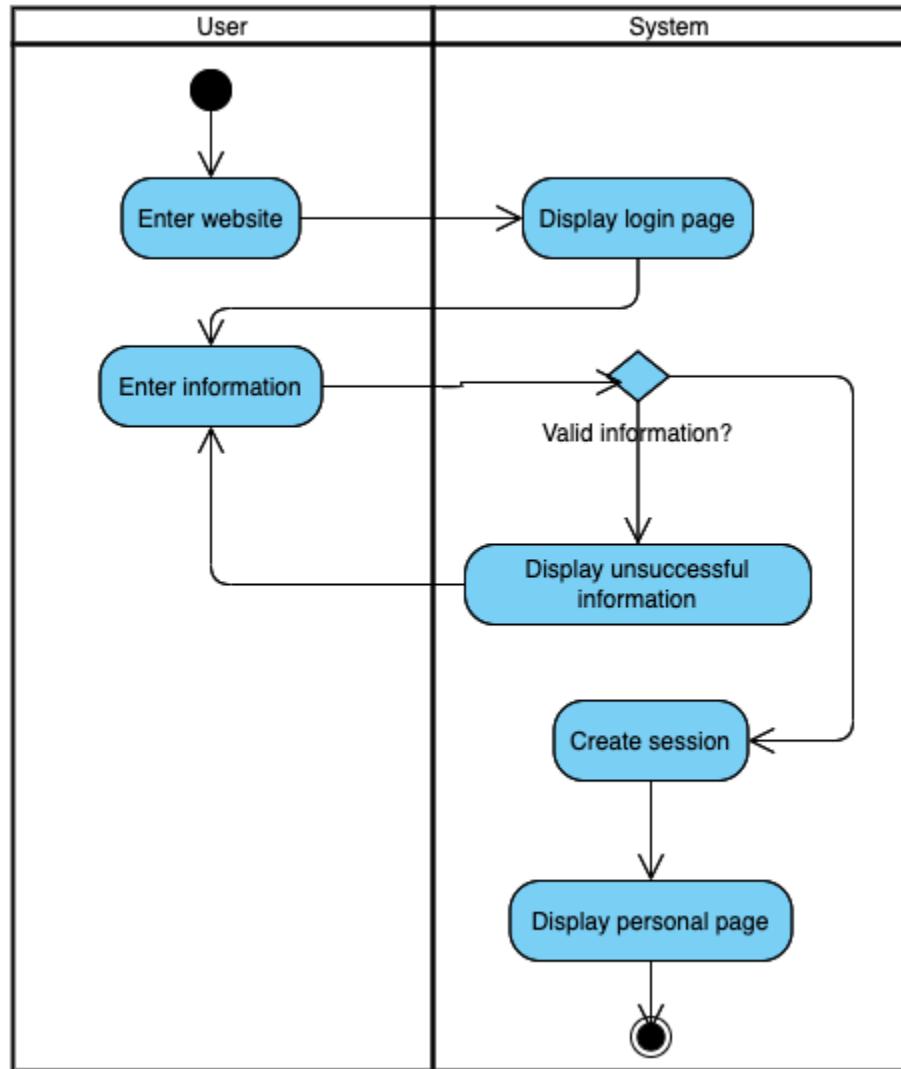
3.3. Activity Diagram

3.3.1. Registration



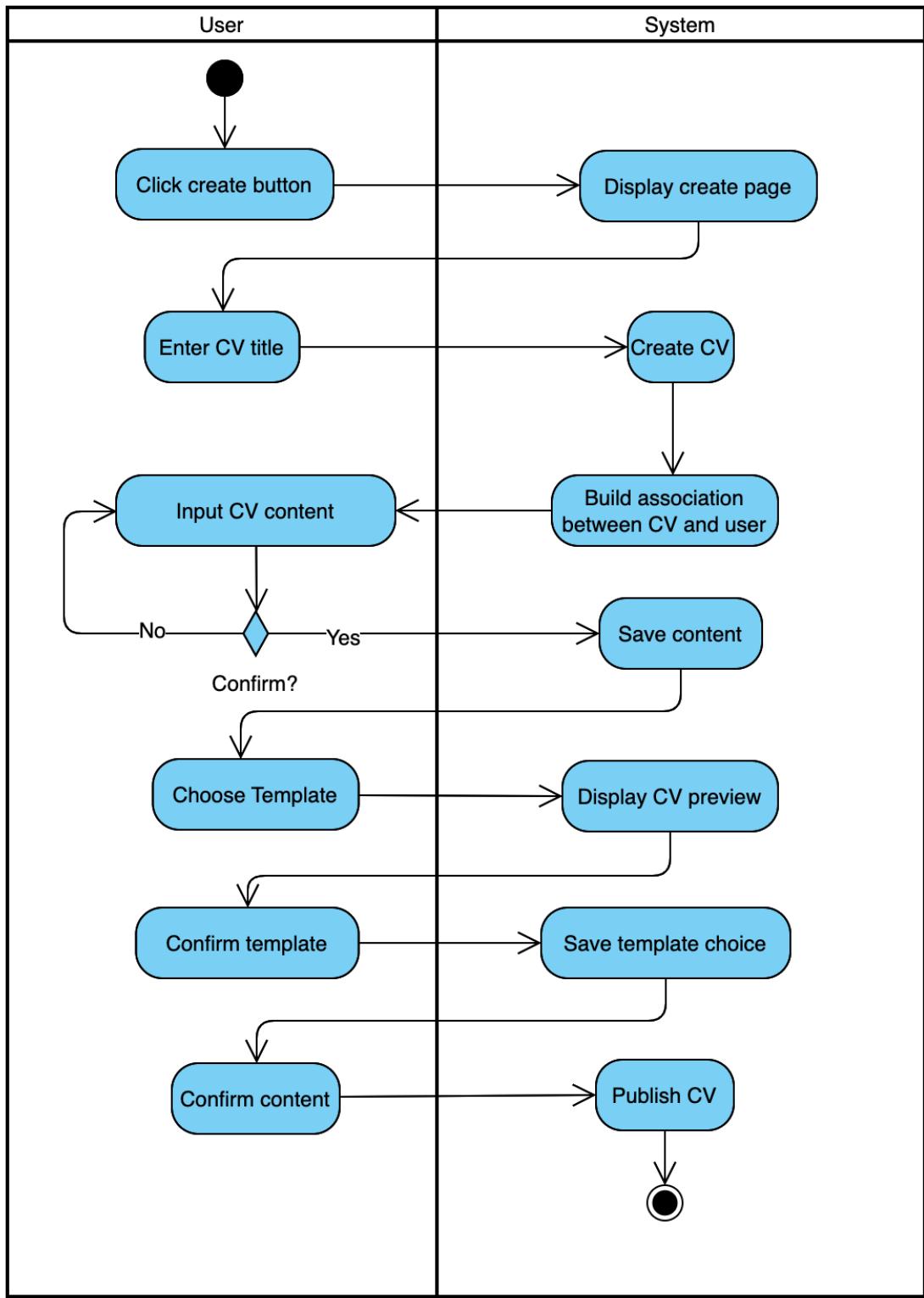
Before using the web system, users need to register for the system. The user clicks the registration button to start the registration process. The system will display the registration form for the user to fill out. The user needs to enter email, username, password, and mobile. The system will check whether the email is valid. If it is invalid, the user needs to figure out a valid email that has not been used. The system will also check whether the password and confirm password are the same. The system will display a password strength score for suggestions. The user can change to a more complex one if the password is too weak. If all the information is valid, the system will create an account.

3.3.2. Login



To login to the system, users (talents, recruiters and admins) need to enter the website and click the login button on the right-top corner. The system will display the login page after users click the button. The user needs to enter the email registered and password. The system will check the validation of the password. If the password is right, the system will create a session for the user. If the password or email is invalid, the user needs to enter account information again.

3.3.3. Create CV

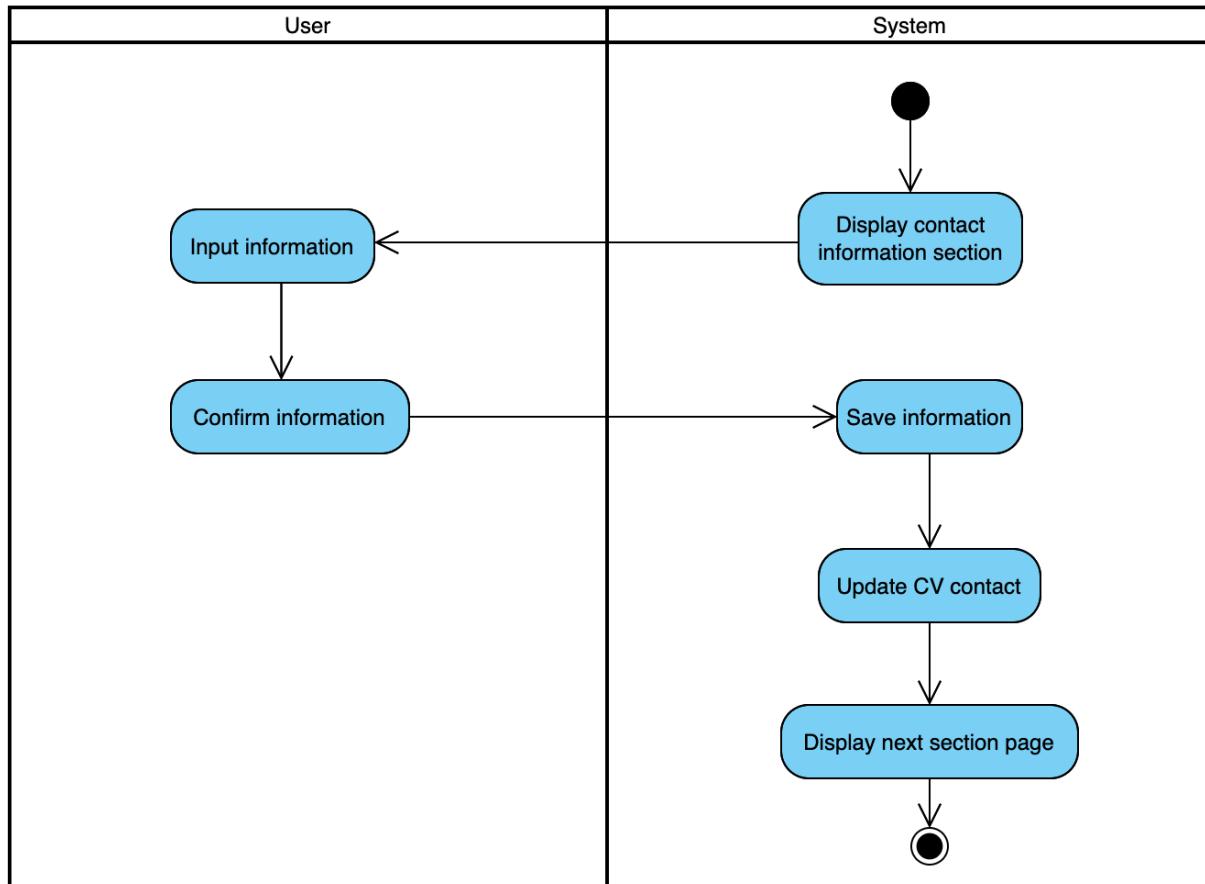


The user needs to enter the create CV page by clicking the create link. The system will display a create page for the user to give the CV a title. After submitting the title, the system will create a CV and build an association of the CV with the user.

The system will ask the user to add the contents of the CV according to sections. The user needs to add contact information, education background, work/internship experience, activity experience, skills and references one by one. If the user wishes to skip some sections, the user can click the skip button to go to the next section. The system will save the content.

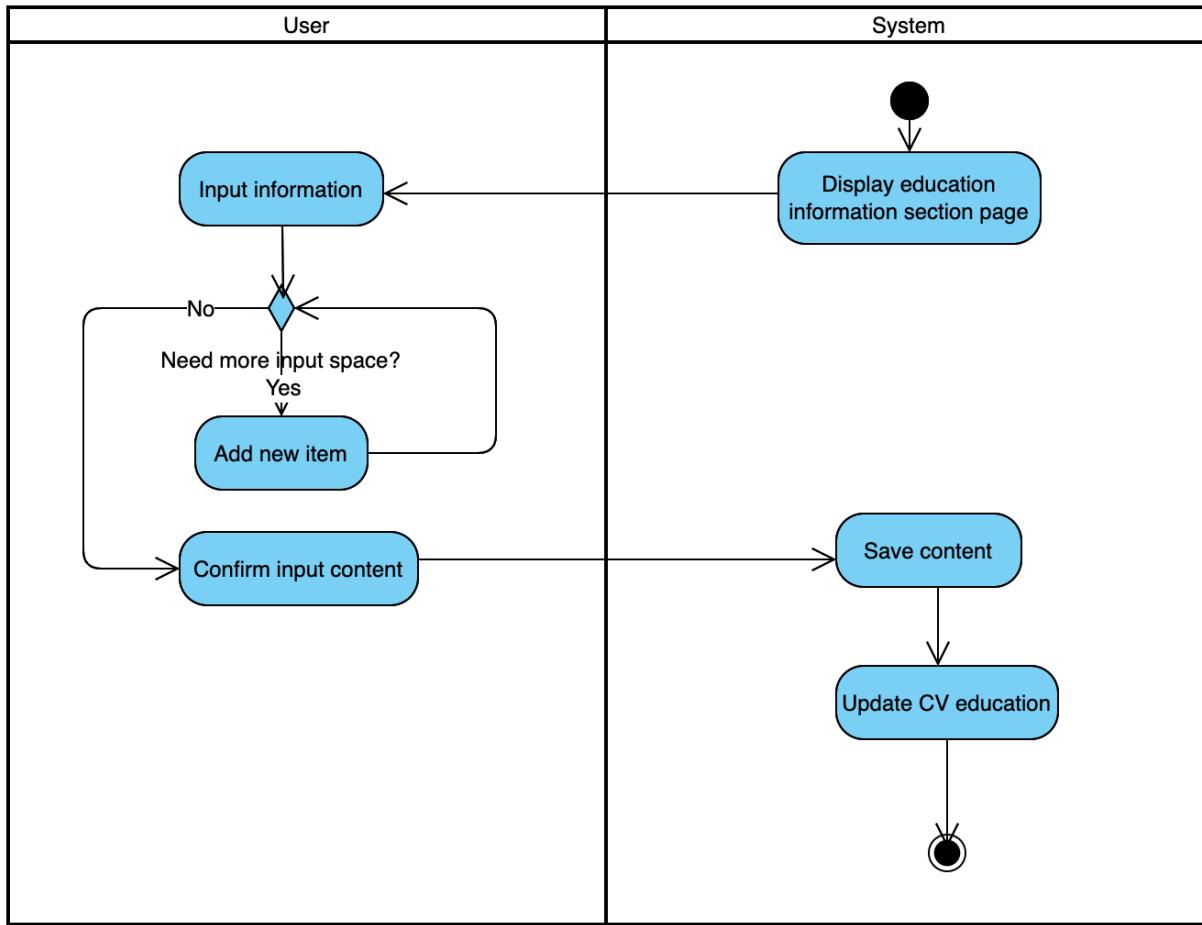
After adding content, the user needs to choose a template and the system will generate a preview page for each template. The user can confirm which template to use and confirm the content after seeing the preview. The system will save the CV and publish it.

3.3.4. Add contact section



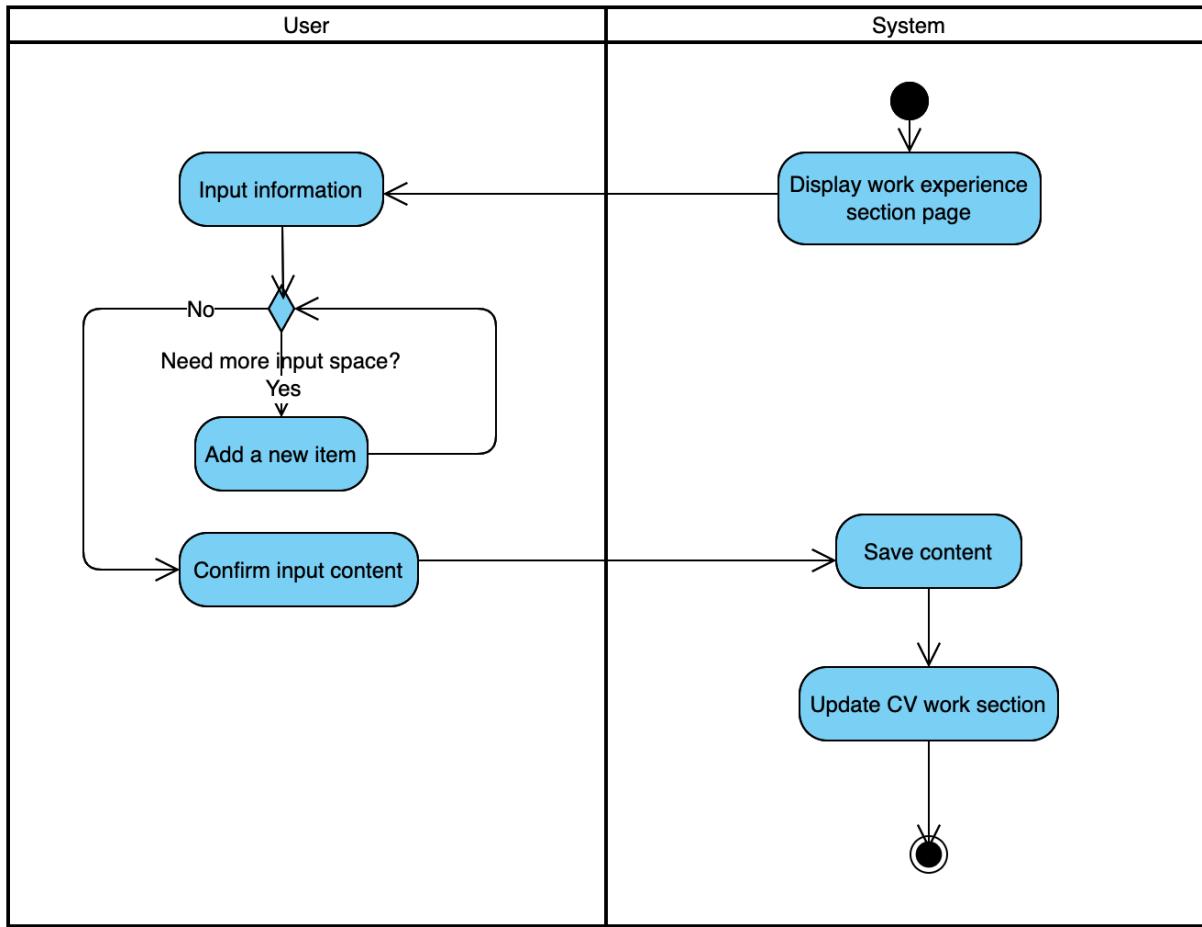
To add contact information for a CV, the user needs to continue the process after clicking the create button. The system will display the contact information section page for the user automatically so the user can input contact information like name, email, mobile number and personal statement of the CV. After confirming the information, the user can submit data to the system. Then the system will save the information and update the corresponding parts of the CV. Finally, the system will lead the user to the next section to add content.

3.3.5. Add education section



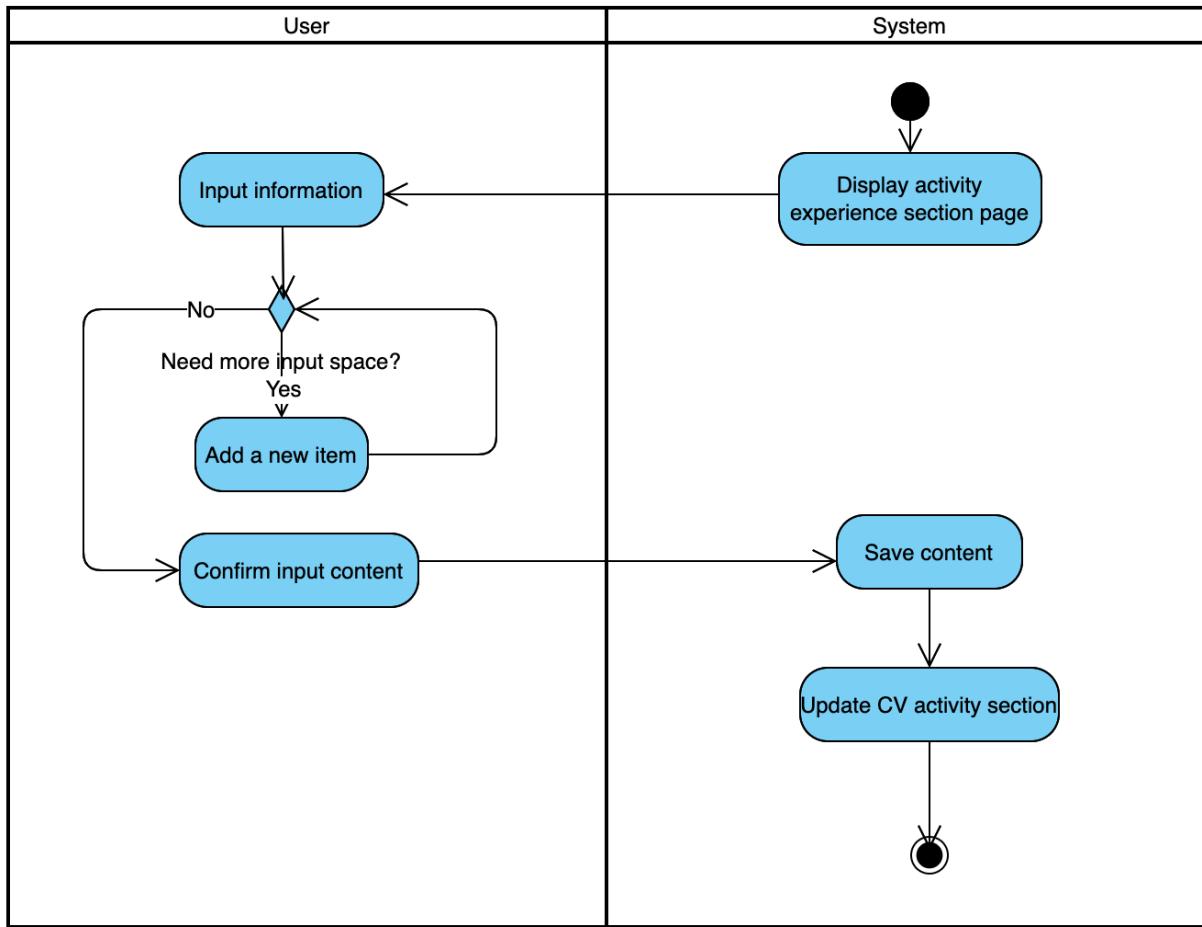
To add education information after creating the CV, the system will display the education information form for the user. If the user wishes to add more than one educational experience, the user can click the “Add one” button on the site and enter the new information in the form. After adding enough information, the user can submit education experience to the system and the system will save the information and update the education section of the CV.

3.3.6. Add work experience section



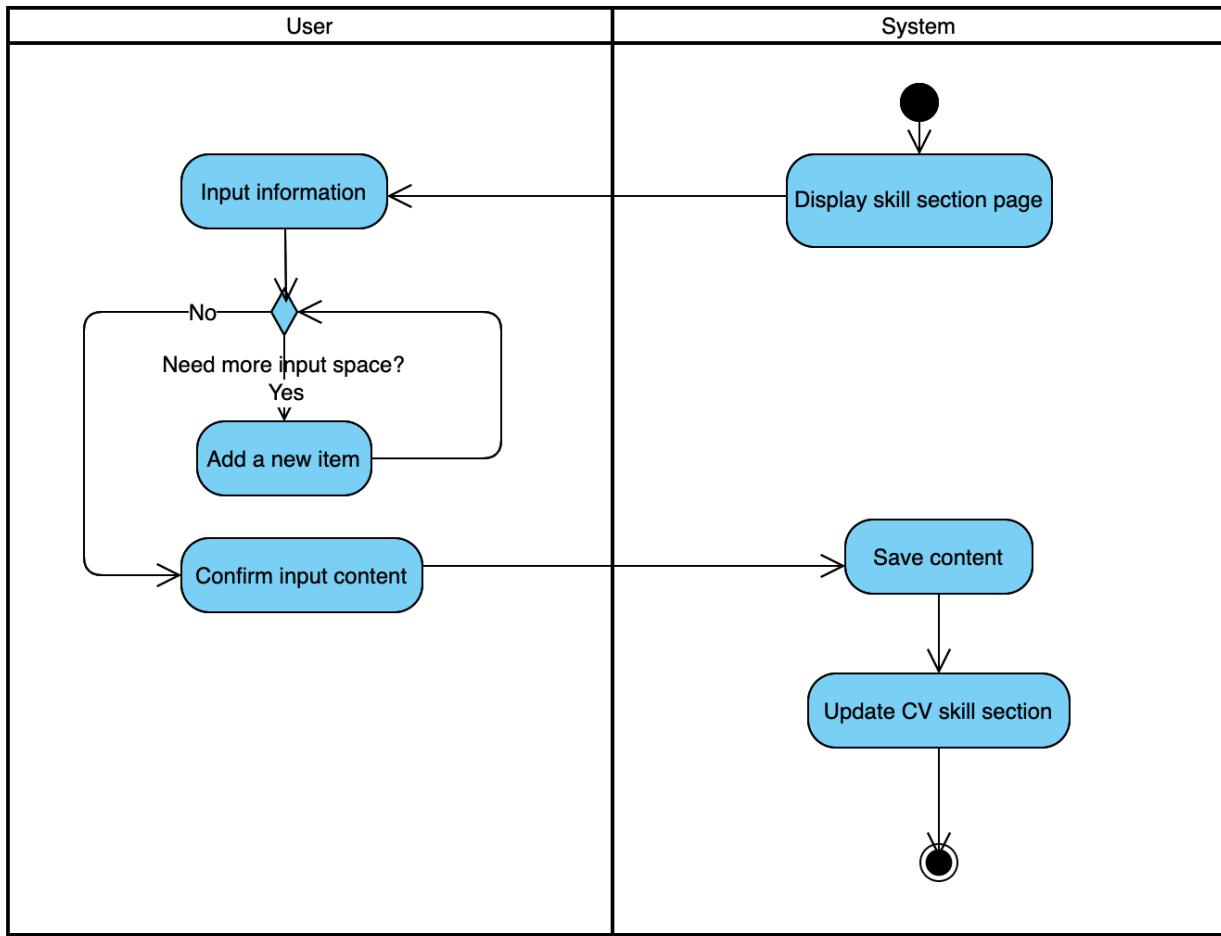
To add work information after creating the education part of the CV, the system will display the work information form for the user. School, start time, end time and description are required in this section. If the user wishes to add more than one work experience, the user can click the “Add one” button on the site. A new form will be displayed and the user can enter the new information in the form. After adding enough information, the user can submit work experience to the system and the system will save the information of the work section of the CV.

3.3.7. Add activity experience section



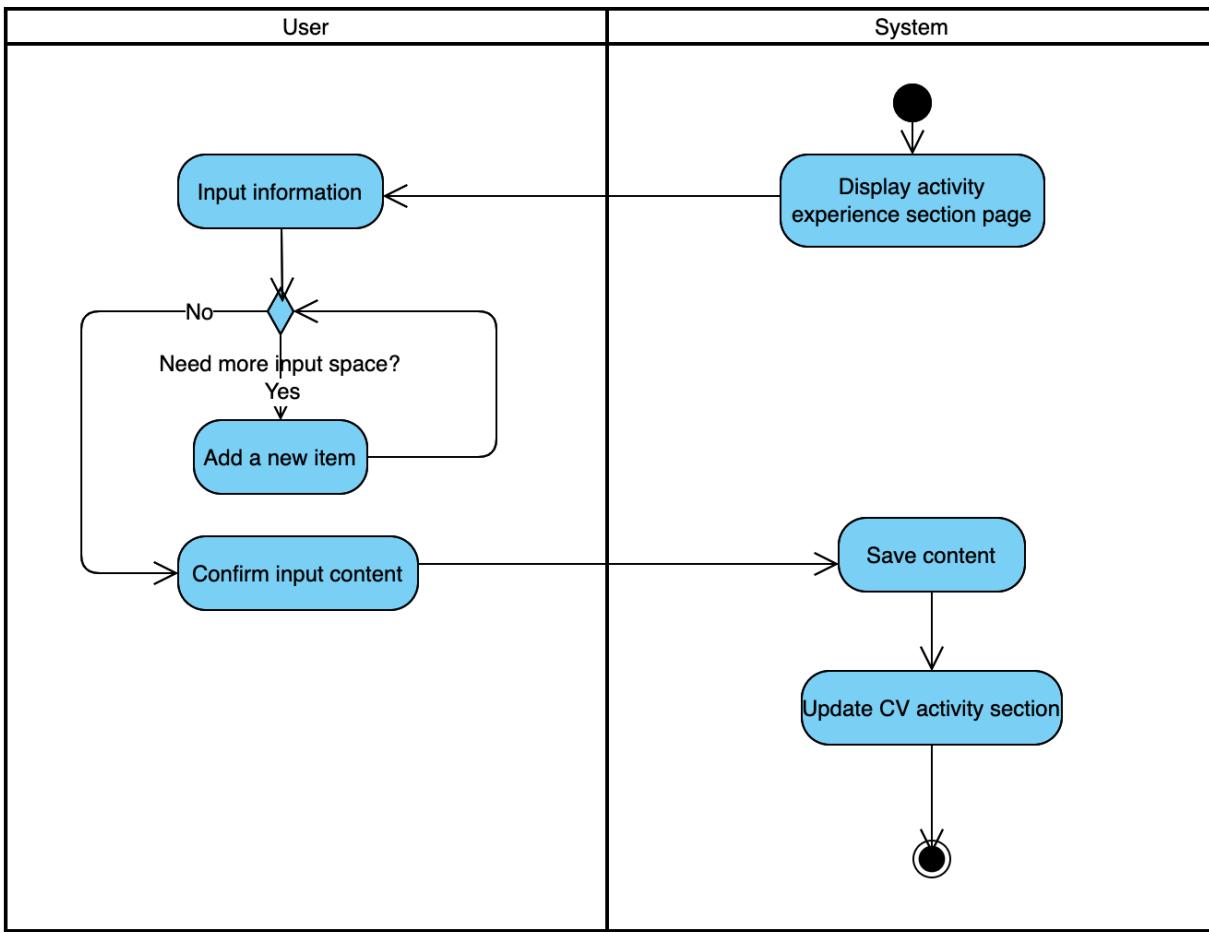
To add work information after creating the education part of the CV, the system will display the work information form for the user. The user needs to input organization, position, start time, end time and description of the work experience. If the user wishes to add more than one work experience, the user can click the “Add one” button on the site. A new form will be displayed and the user can enter the new information in the form. After adding enough information, the user can submit work experience to the system and the system will save the information of the activity section of the CV.

3.3.8. Add skill section



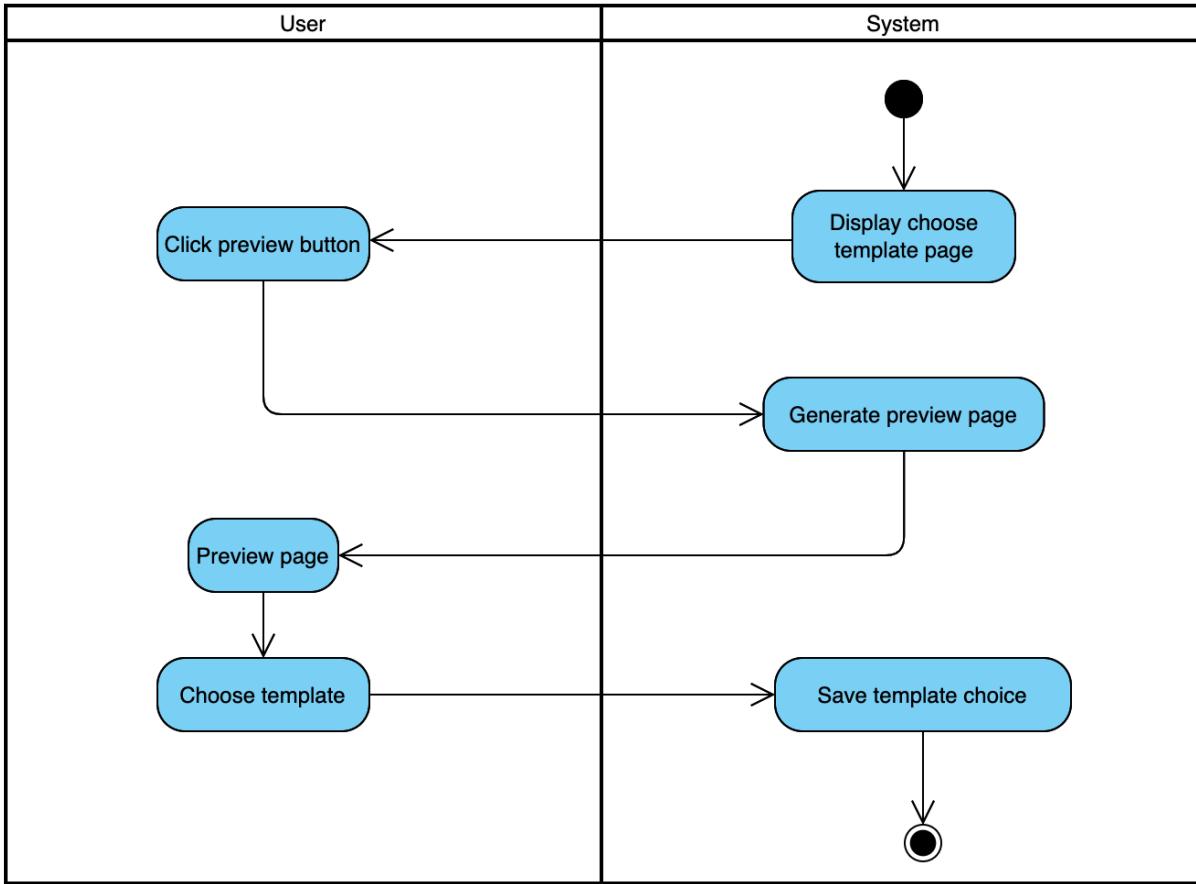
To add skill information after creating the work part of the CV, the system will display the skill information form for the user. The user needs to input the name of the skill and the level of technical ability. If the user wishes to add more than one skill, the user can click the “Add one” button for one more form. A new form will be displayed and the user can enter the new information in the form. After adding enough information, the user can submit skills to the system and the system will save the information of skill section of the CV.

3.3.9. Add reference section



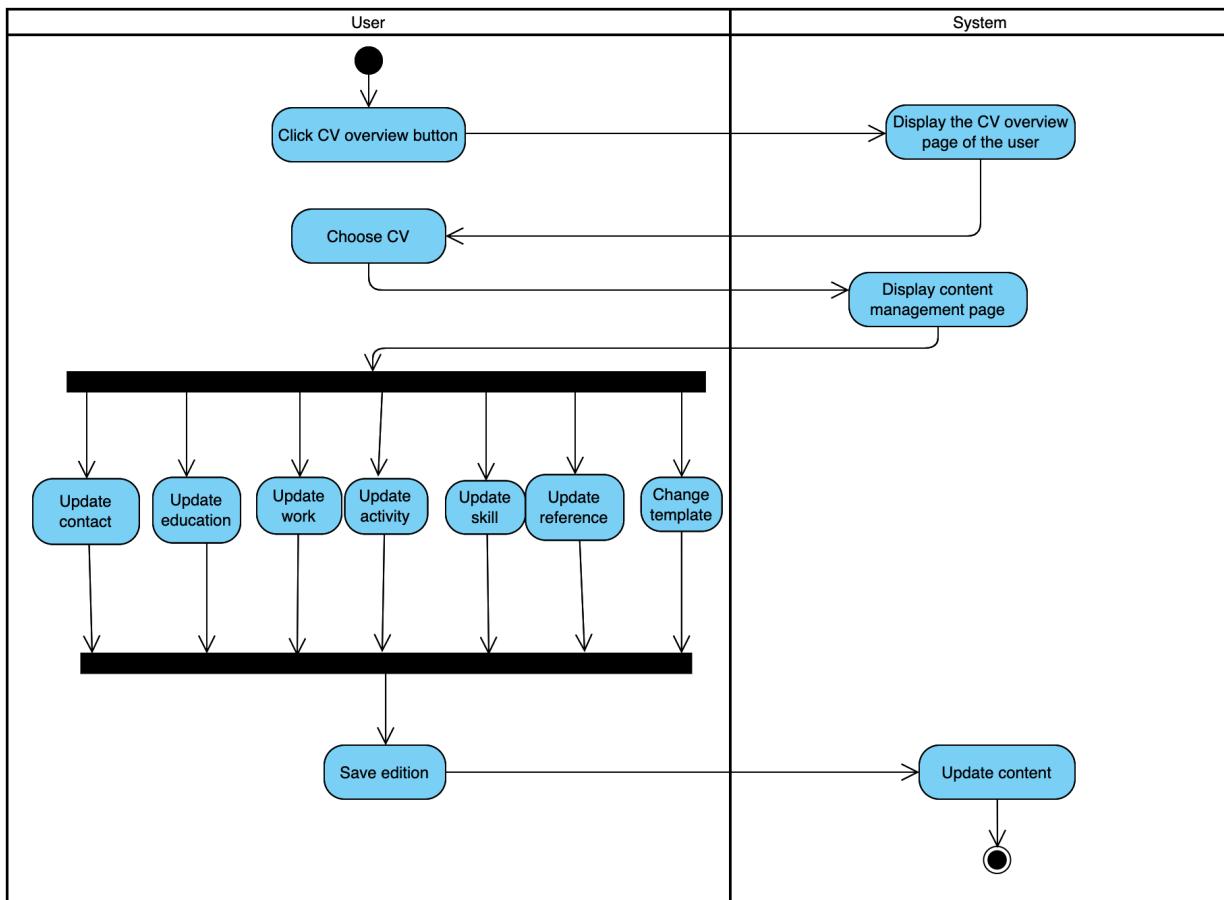
To add reference information after creating the skill part of the CV, the system will display the skill information form for the user. The user needs to input the name of the reference, relationship with the reference and the description. If the user wishes to add more than one reference, the user can click the “Add one” button for one more form. A new form will be displayed and the user can enter the new information in the form. After adding enough information, the user can submit skills to the system and the system will save the information of reference section of the CV.

3.3.10. Choose Template



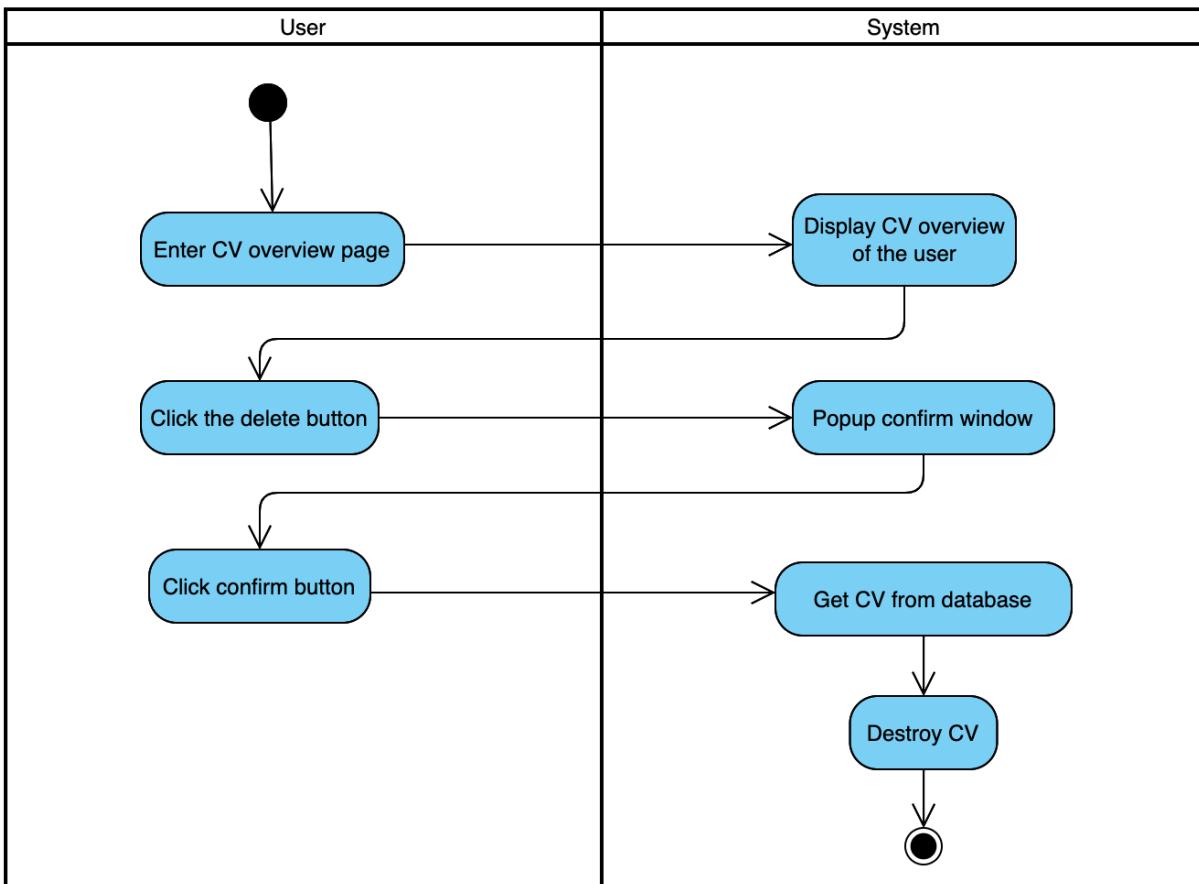
After adding all sections of content, the user can choose the template for the CV. The system will lead the user to the template-choose page, then the user can click the link on the page for previews. Once receive the request, the system will generate a CV preview of the template with the content of the CV in a new window. If the user is satisfied with the template, the user can click the radio button to choose the template, or the user can preview and choose other templates. After the user confirms the template, the system will save the template choice. The process of creating a new CV end.

3.3.11. Update CV content



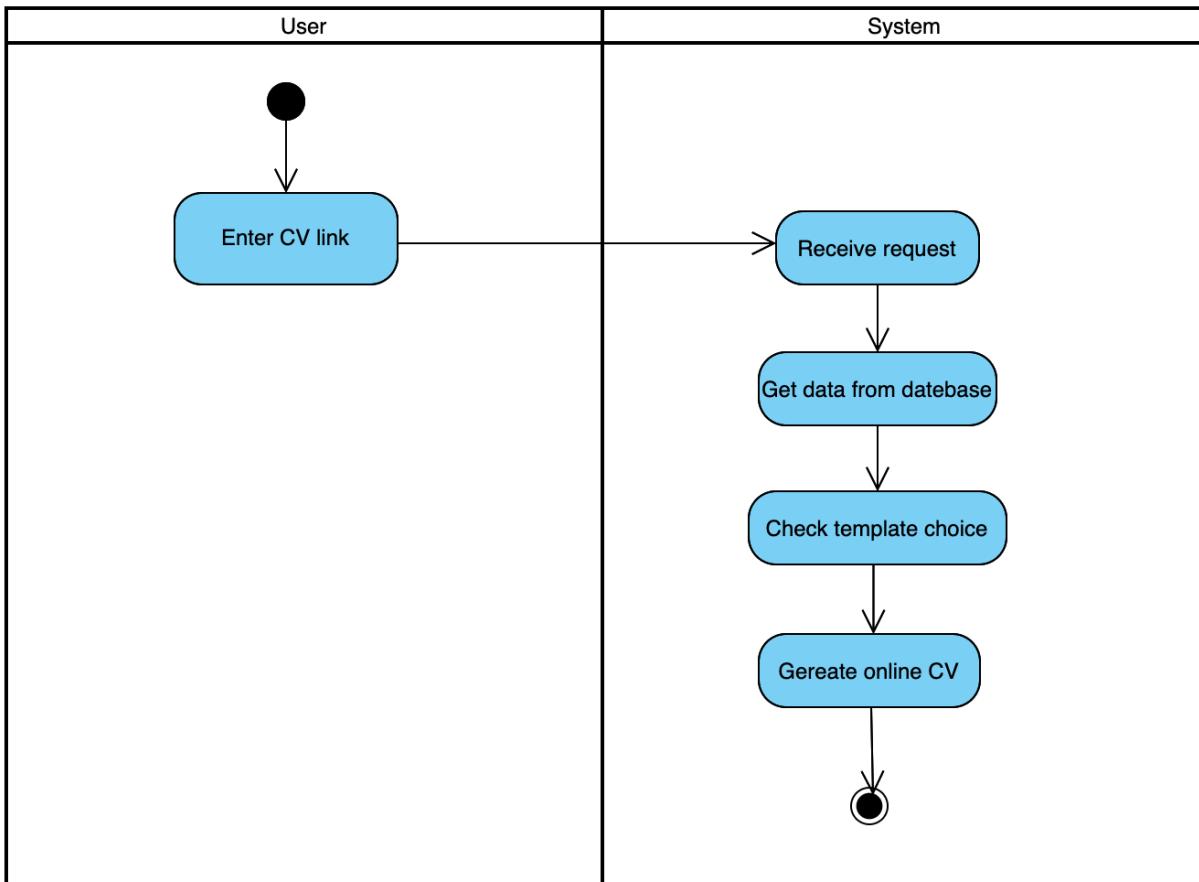
To update a CV, the user needs to enter the CV overview page and chooses the one need to be updated. The user can update different sections of the CV one by one on this page. The user can choose to update contact information, education history, work experience, activity experience, skills, reference and template. After submitting updated content, the system will save the updates.

3.3.12. Delete CV



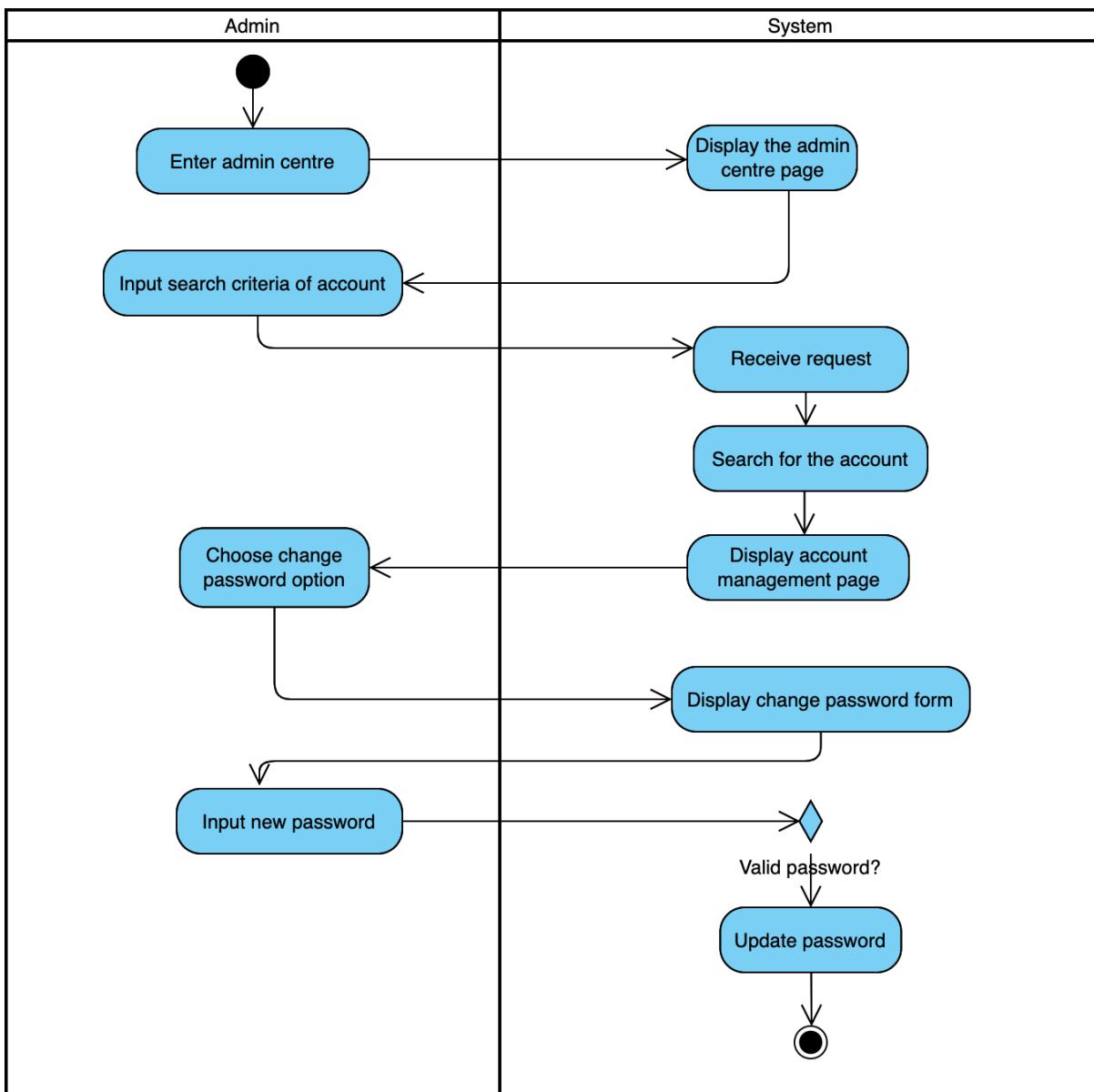
To delete a CV, the user needs to enter the CV overview page first and the system will display the CV overview page according to the information of the specific user. Then, the user can click the delete button. The system will pop up a confirm window for the user to double confirm. If the user is determined to delete the CV, the user can press yes and the system will destroy the CV, if not, the user can press cancel to keep the CV.

3.3.13. View CV



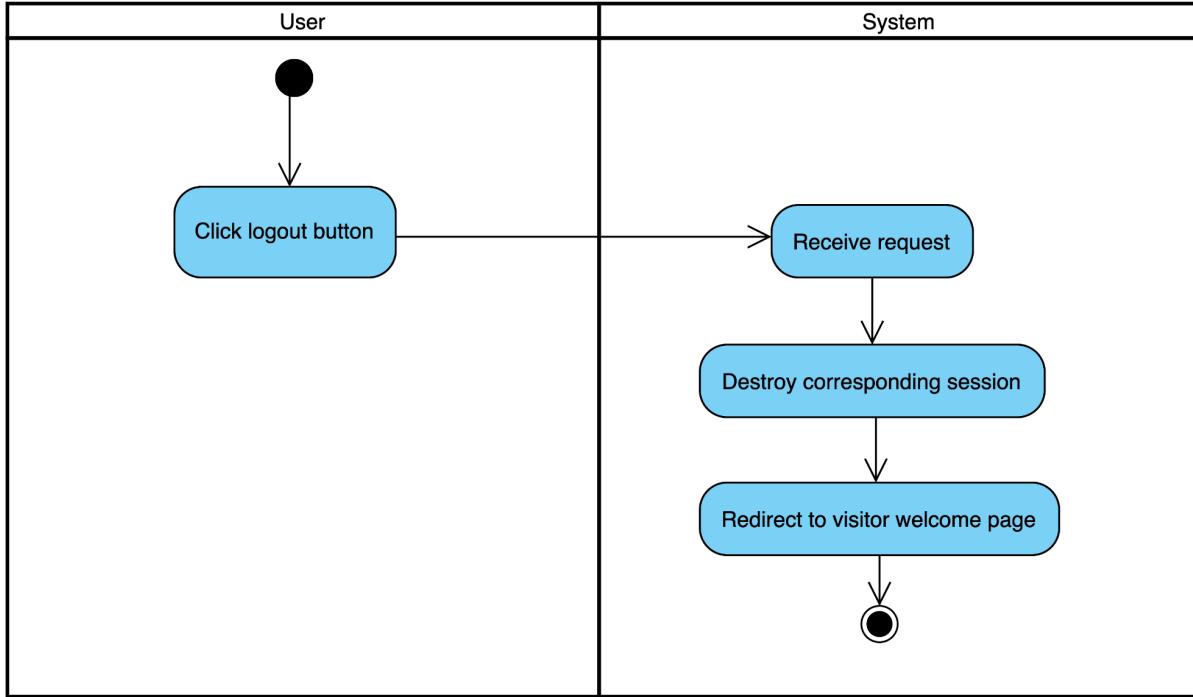
The users and the visitors can all visit a CV through the link generated by the system. Once the system receives the request, the system will get the data of the CV and check the template of the CV. Then, the system will generate the CV page for viewers to view. If the viewer wishes to download the CV, the viewer can click the download button on the page.

3.3.14. Change password



Admin can change the password of the users. The admin can enter the admin centre to manage accounts. The system will display the admin management page for the admin. The admin can search for the user by inputting the searching criteria. The system will get the data of the user and display the management page for the admin. The admin can choose to change the password of the specific user. The system will display the change password page for the admin. The admin can change the password by filling out the form and submitting it. The system will update the password of the user.

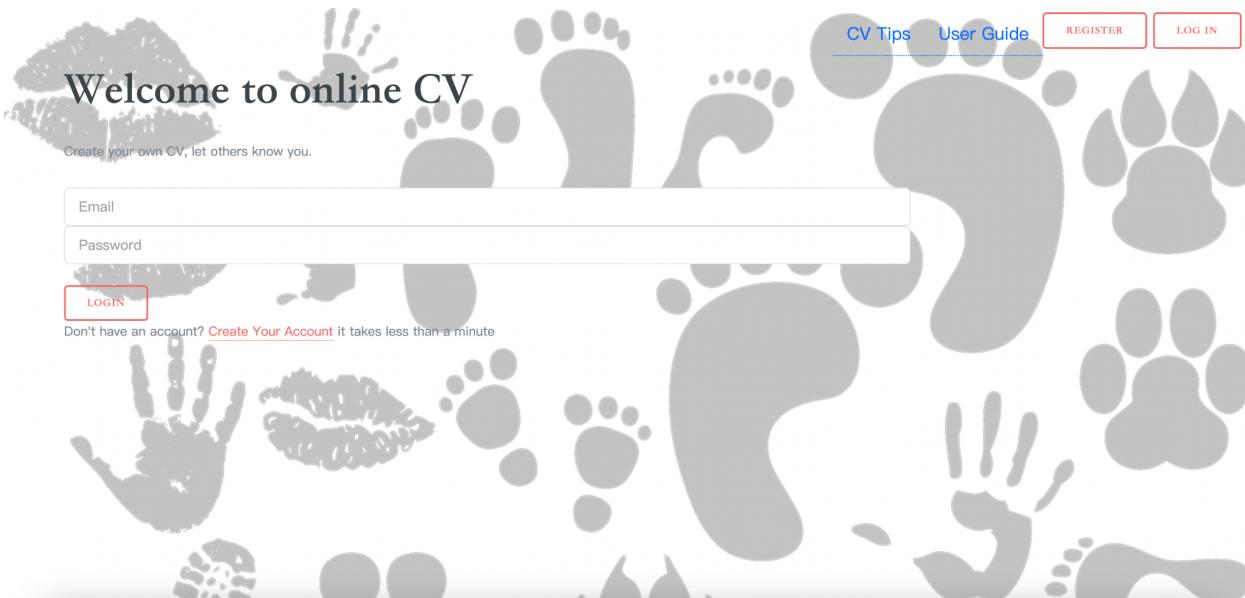
3.3.15. Logout



To log out of the system, the user needs to press the logout button. The system will receive the logout request and destroy the corresponding user session. After that, the system will lead the user to the welcome page.

3.4. User Interface Prototype

3.4.1. Welcome Page



3.4.2. CV Tips

Users can click the navigation to view different sections of the tip page.

A screenshot of the 'CV Tips' page. The background is decorated with handprints and footprints. At the top right are navigation links: 'CV Tips' (highlighted in blue), 'User Guide', 'REGISTER' (in a red box), and 'LOG IN' (in a red box). Below the links is a horizontal navigation bar with four items: 'Introduction', 'Writing Tips', 'Common Mistakes', and 'Examples'. The 'Introduction' section is currently active. It contains a sub-section 'What is a CV' with the following text: 'A CV, which stands for curriculum vitae, is a document used when applying for jobs. It allows you to summarise your education, skills and experience enabling you to successfully sell your abilities to potential employers. Alongside your CV employers also usually ask for a cover letter.' Another sub-section 'What to include in a CV' has the following text: 'A standard CV in the UK should be no longer than two sides of A4. A new graduate with minimal experience may only need to use one side of A4.' A third sub-section 'Stick to relevant information and don't repeat what you've said in your cover letter.' is partially visible. At the bottom of the page are three tabs: 'Contact details', 'Education', and 'Work Experience', each with a small amount of supporting text.



3.4.3. Registration Page



The screenshot shows a registration form overlaid on a background of various handprints and footprints. The form includes fields for Username, Email, Password, Confirm password, and Mobile, along with a SUBMIT button. A red bar at the bottom indicates a low password score.

Registration
Account information
Username:
Allen
Email:
Allen@onlineCV.com
Password:

Password score:
Confirm password:

Mobile:
76891204
SUBMIT

CV Tips User Guide REGISTER LOG IN

The system will give the password a score. If the password is weak (eg. pure number or less than 8 digits), the system will display a red bar and the user needs to change the password to a stronger one.

3.4.4. Login Page



The screenshot shows a login form with a successful login message in a modal window. The modal says "localhost:1337 显示" and "Welcome back, Allen". The background features a collage of handprints and footprints. A red box highlights the "LOGIN" button.

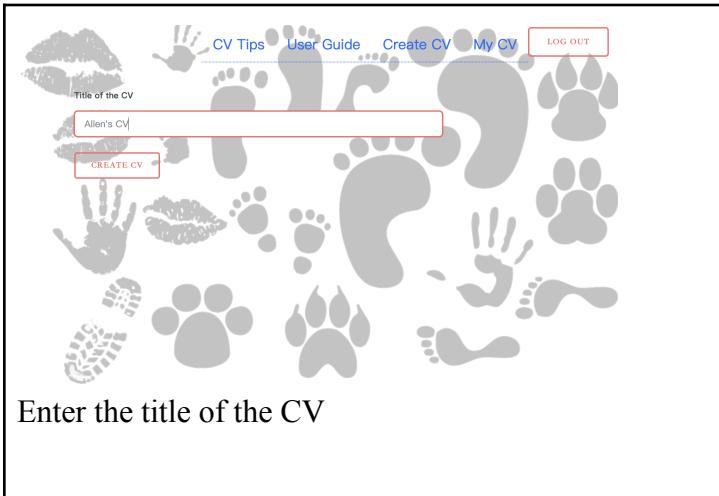
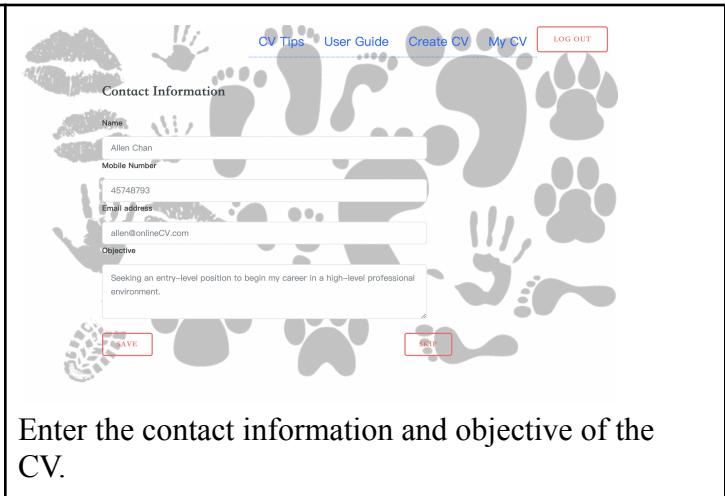
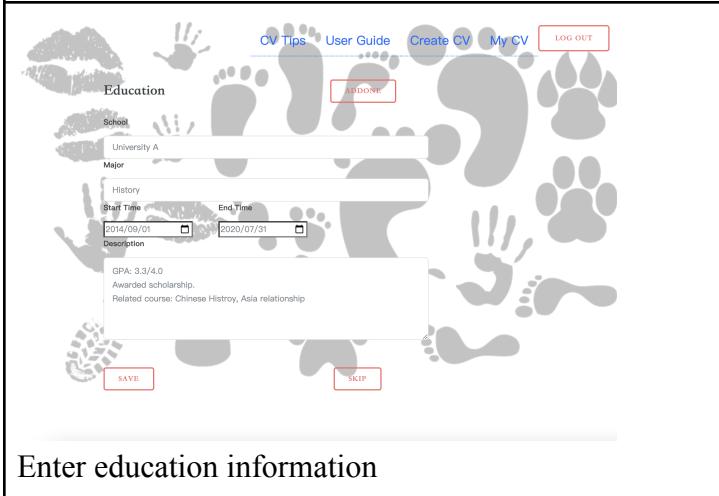
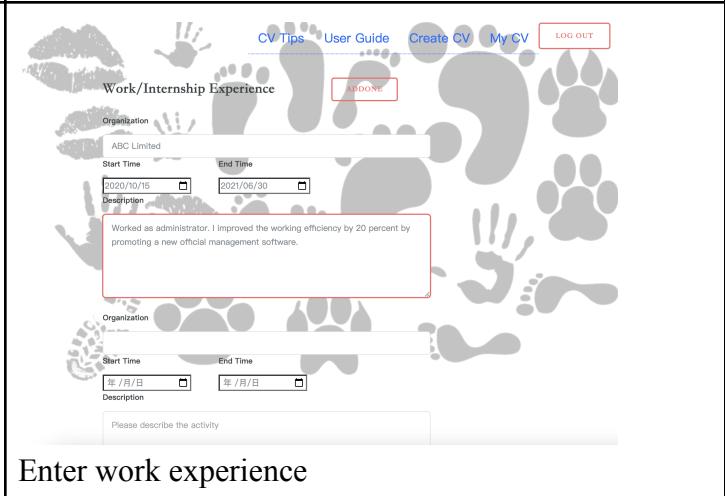
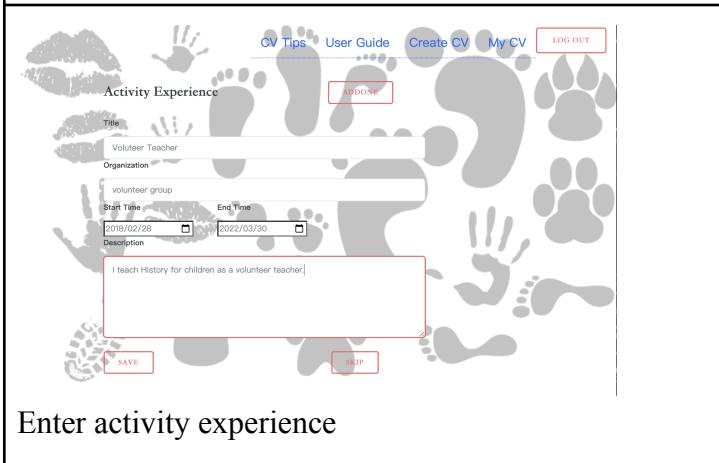
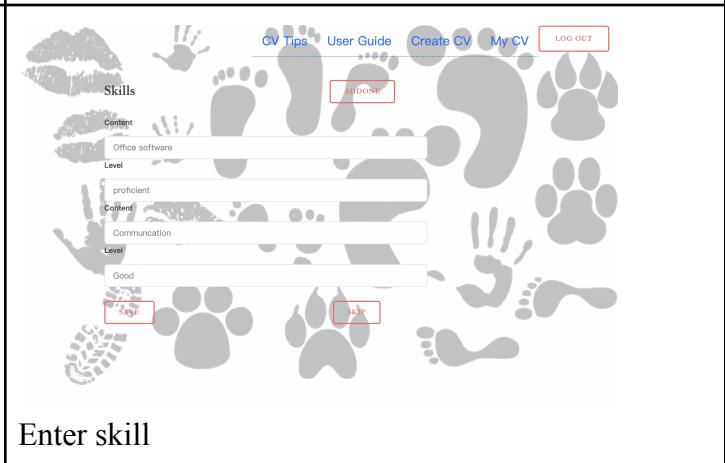
User Login
localhost:1337 显示
Welcome back, Allen
确定
Allen@onlineCV.com

LOGIN

CV Tips User Guide REGISTER LOG IN

点击可后退，按住可查看历史记录

3.4.5. Create CV & Contents

 <p>Enter the title of the CV</p>	 <p>Enter the contact information and objective of the CV.</p>
 <p>Enter education information</p>	 <p>Enter work experience</p>
 <p>Enter activity experience</p>	 <p>Enter skill</p>

Reference

Name: Amy Wong

Relationship: Supervisor

Contact: 41258423

Comment: Allen is a hardworking staff. It is my pleasure to work with him.

ADD ONE

DONE

SAVE

Skip

Enter reference

3.4.6. CV Content management Page

View content of each section

Contact
Contact Info
Add contact information for others contact you.
[View Contact](#)

Work
Work History
Introduce your education experience.
[View Work](#)

Activity
Activity Experience
Introduce what you have done.
[View Activity](#)

Education
Education History
Introduce your education experience.
[View Education](#)

Skill
Skills
Introduce what you can do.
[Create skills](#)

Reference
Recommendation
How do other people evaluate you?
[View Reference](#)

Public

Choose template
Please select a template:
 Dark [Preview-dark](#)
 White [Preview-white](#)

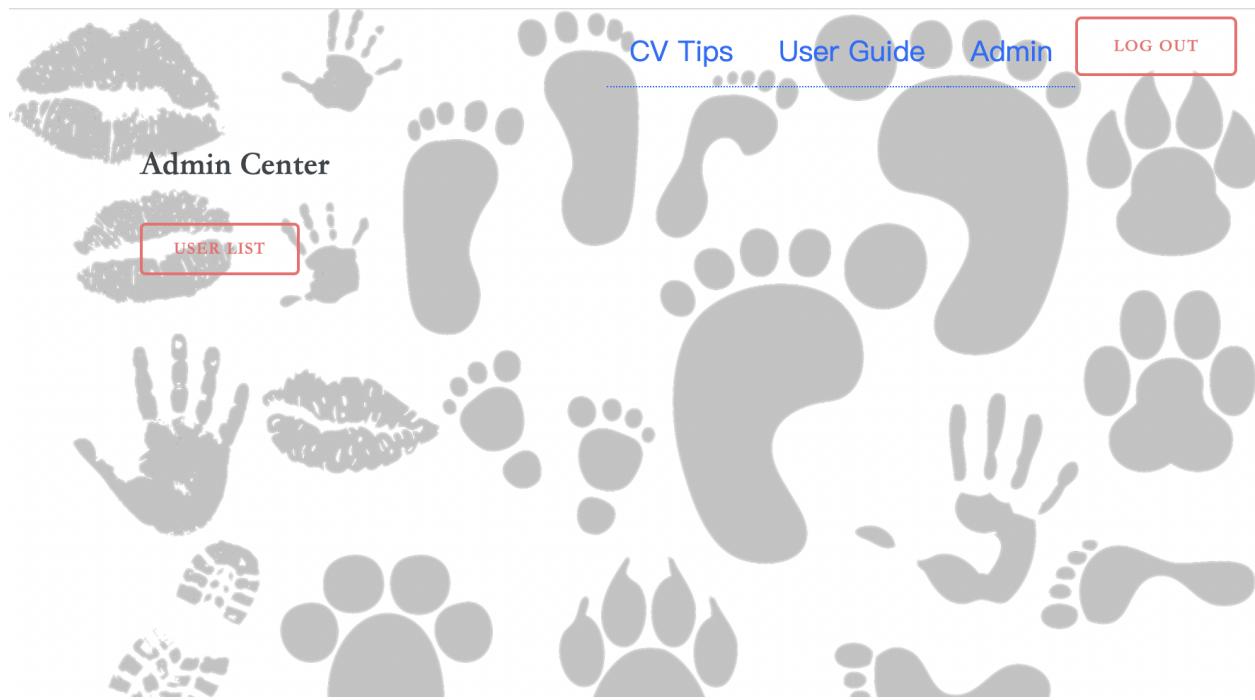
CONFIRM

The content management page. The user can enter different sections through the links to update information. The publish button on the right top is used for the user to set the status of the CV. The user can also choose the template of the CV and click confirm button to save it.

3.4.7. CV overview page for the user



3.4.9. Admin Page

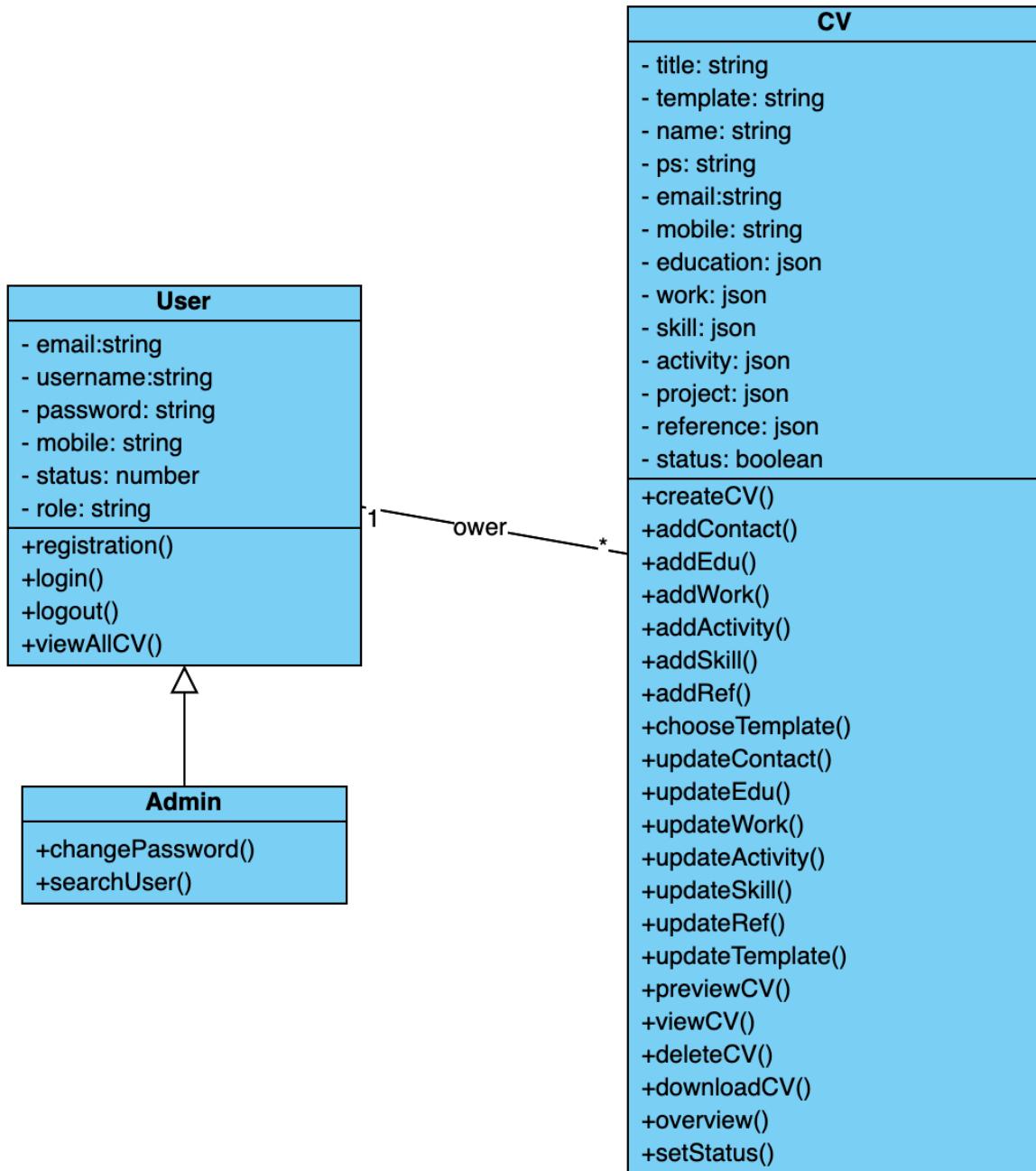


3.4.10. Admin search user



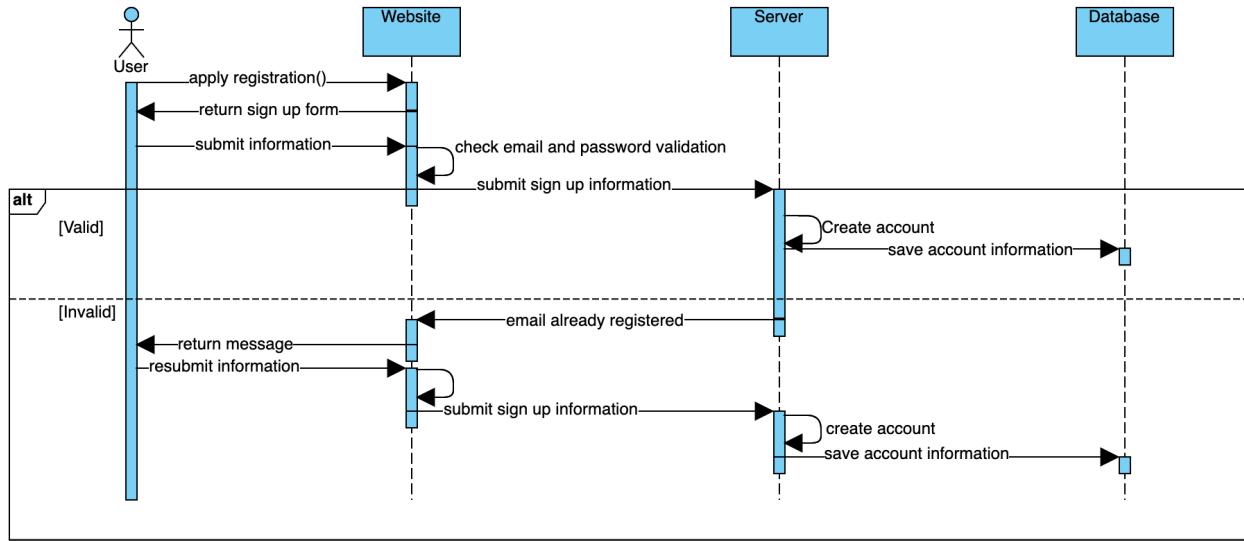
4. System Design

4.1. Class Diagram (with attributes and methods)



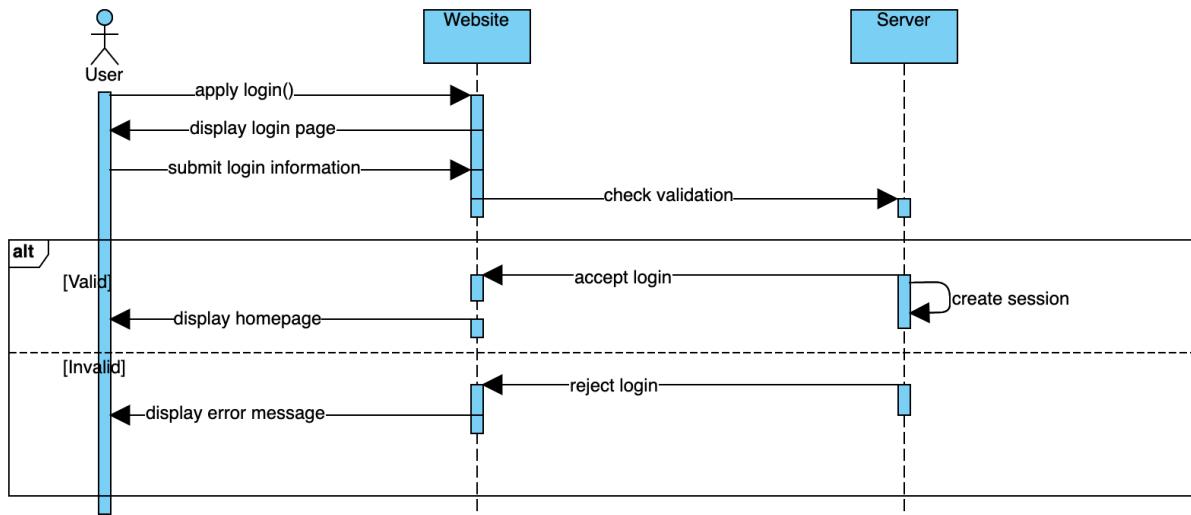
4.2. Sequence Diagram

4.2.1. Registration



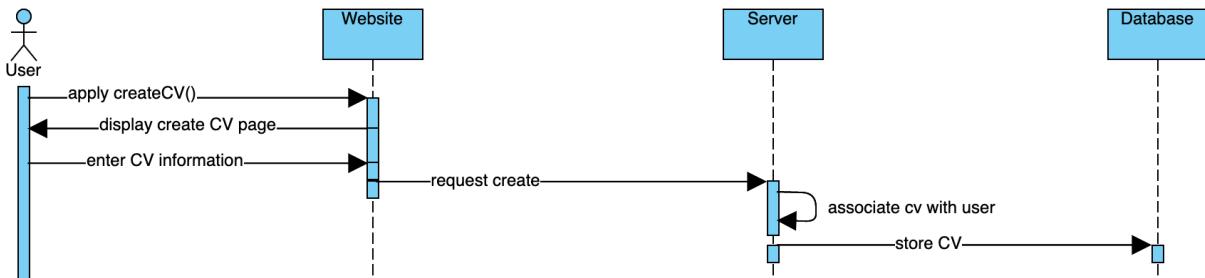
To register for the system, the user needs to apply for registration and the user interface will display the registration form. The user needs to fill in the form and submit it. The website will check whether email and passwords are valid. If the email address and password are valid, the website will pass the information to the server. The server will create an account for the user and save the information in the database. If the email address or the password input by the user is invalid, the user interface will return a message to the user to let the user know. Then, the user can resubmit the form. If the information is valid, the user interface will submit the information to the server and the server will create an account for the user.

4.2.2. Login



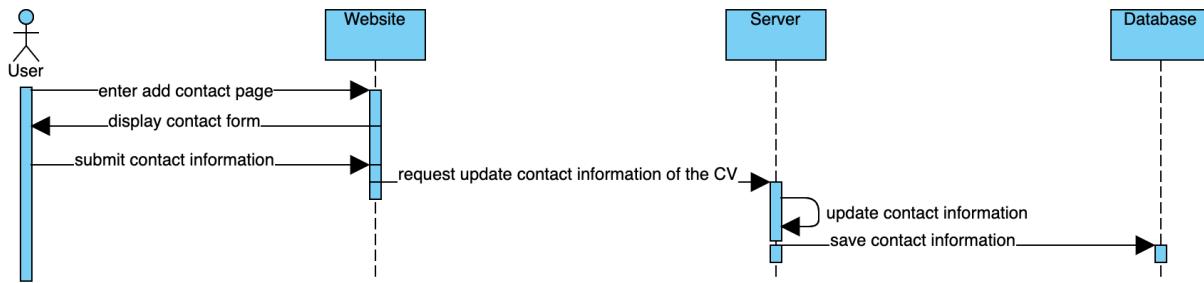
To log in to the system, the user needs to apply the login function. The user interface will display a login page for the user and the user can submit login information by filling out the form. The user interface receives the data and then pass the data to the server to check validation. If the login data is valid, the server will create a session for the user and the user interface will display the homepage for the user. If the data is invalid, the server will reject login and the user interface will display an error message for the user and the user should try again.

4.2.3. Create CV



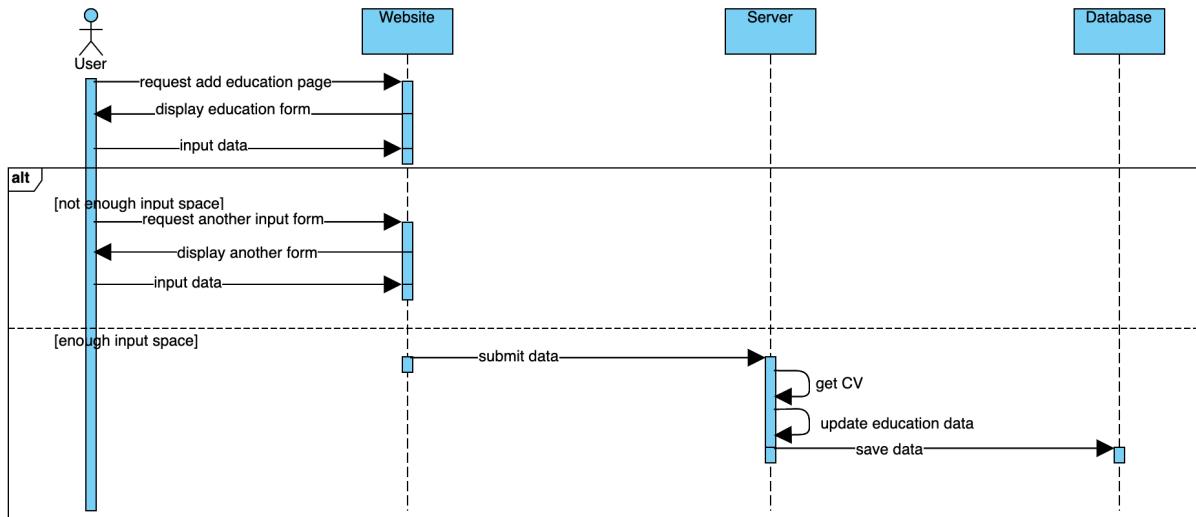
To create a CV, the first step is to apply the create CV function. The user can create a new CV by clicking the create CV button. The user interface will display a create CV page for the user. The user can give the CV a name and submit the creation request. The user interface will pass the request to the server. The server will create the CV and associate the CV with the user and then store the CV in the database.

4.2.4. Add Contact Section



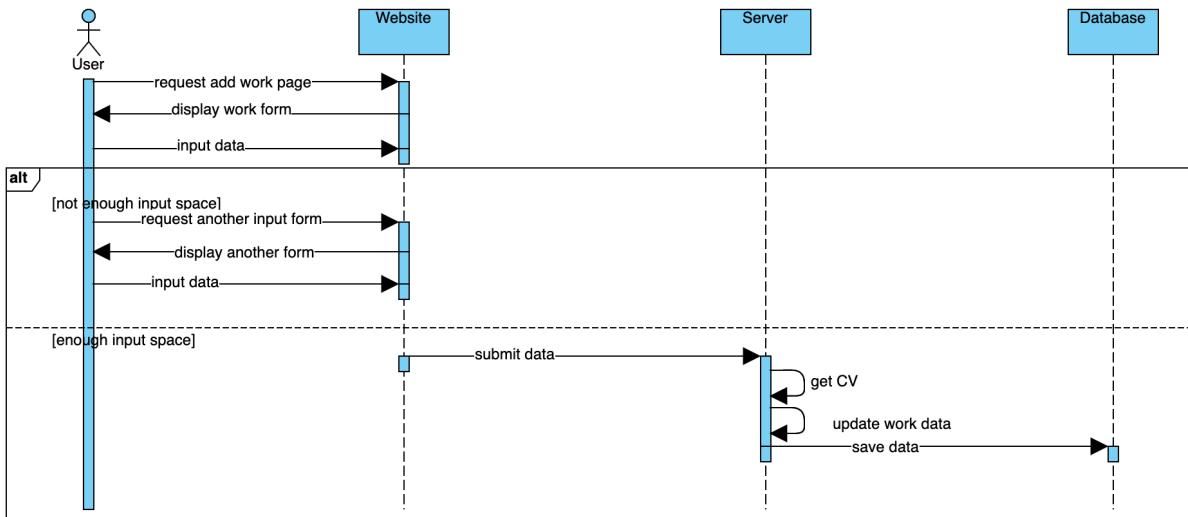
To add the contact section, the user needs to enter the contact page and the user interface will display the contact information page for the user. The user can submit contact information through the form. The user interface will pass the request to the server. The server will update the information of the CV and save information in the database.

4.2.5. Add Education Section



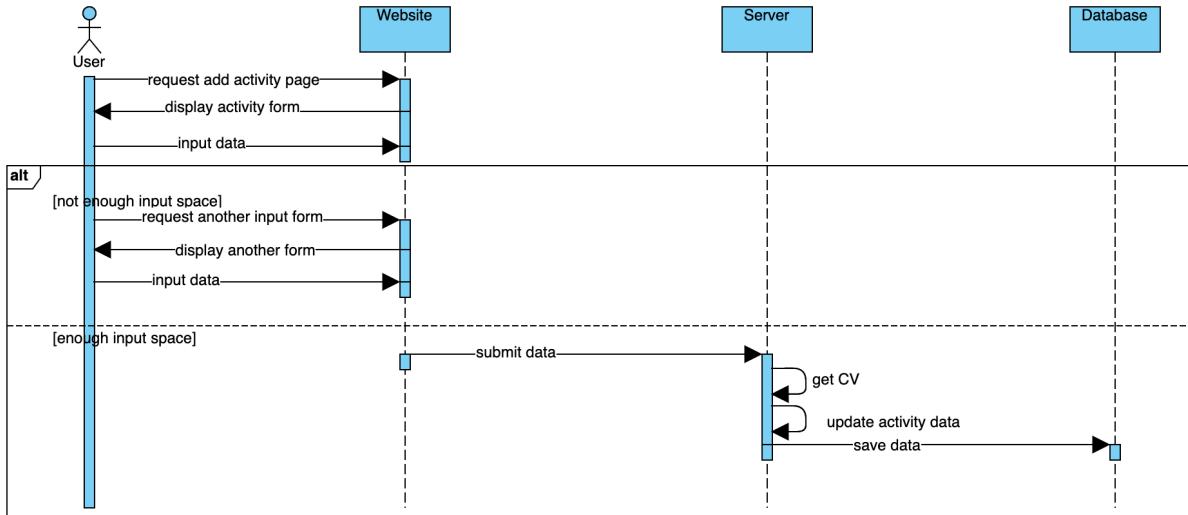
To add the education section, the user needs to enter the education page and the user interface will display the education section page for the user. The user can fill in the form with the education record. If the input is not enough, the user can request the user interface for another input space. The user interface will display another form below the original one for the user to input data. If the input space is enough for the user, the user can submit data. The user interface will pass data to the server. The server will update the record of the education section of the corresponding CV and save data in the database.

4.2.6. Add Work Experience Section



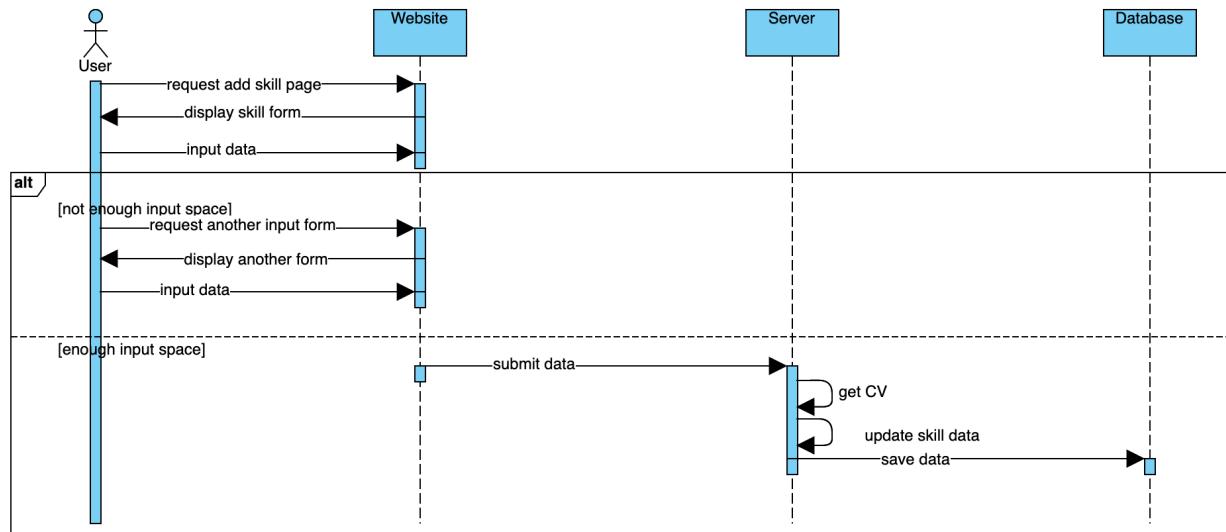
To add the work section, the user needs to enter the work page and the user interface will display the work section page for the user. The user can fill in the form with the work experience. If the input space is not enough, the user can request the user interface for another input form. The user interface will display another form below the original one for the user to input data. If the input space is enough for the user, the user can submit data. The user interface will pass data to the server. The server will update the record of the work section of the corresponding CV and save data in the database.

4.2.7. Add Activity Experience Section



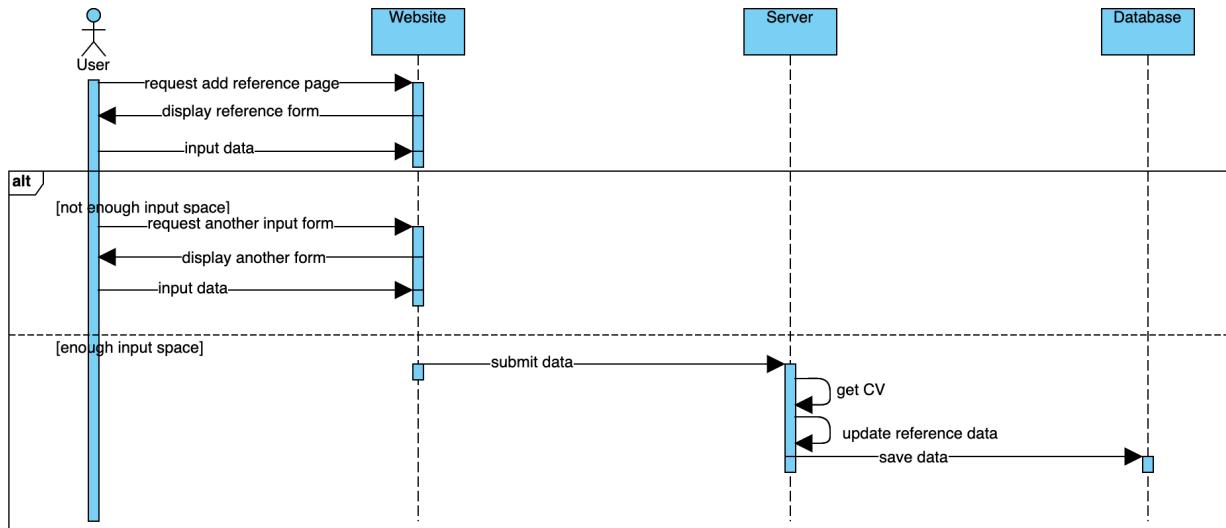
To add the work section, the user needs to enter the work page and the user interface will display the work section page for the user. The user can fill in the form with the work experience. If the input space is not enough, the user can request the user interface for another input form. The user interface will display another form below the original one for the user to input data. If the input space is enough for the user, the user can submit data. The user interface will pass data to the server. The server will update the record of the work section of the corresponding CV and save data in the database.

4.2.8. Add Skill Section



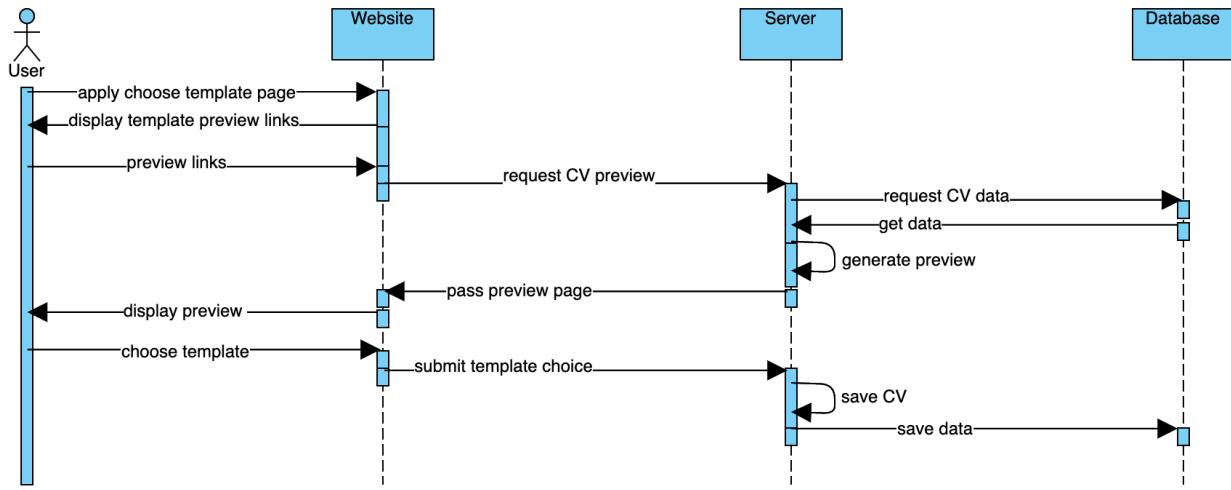
To add the skill section, the user needs to enter the skill page and the user interface will display the skill section page for the user. The user can fill in the form with the skills. If the input space is not enough, the user can request the user interface for another input form. The user interface will display another form below the original one for the user to input data. If the input space is enough for the user, the user can submit data. The user interface will pass data to the server. The server will update the record of the skill section of the corresponding CV and save data in the database.

4.2.9. Add reference Section



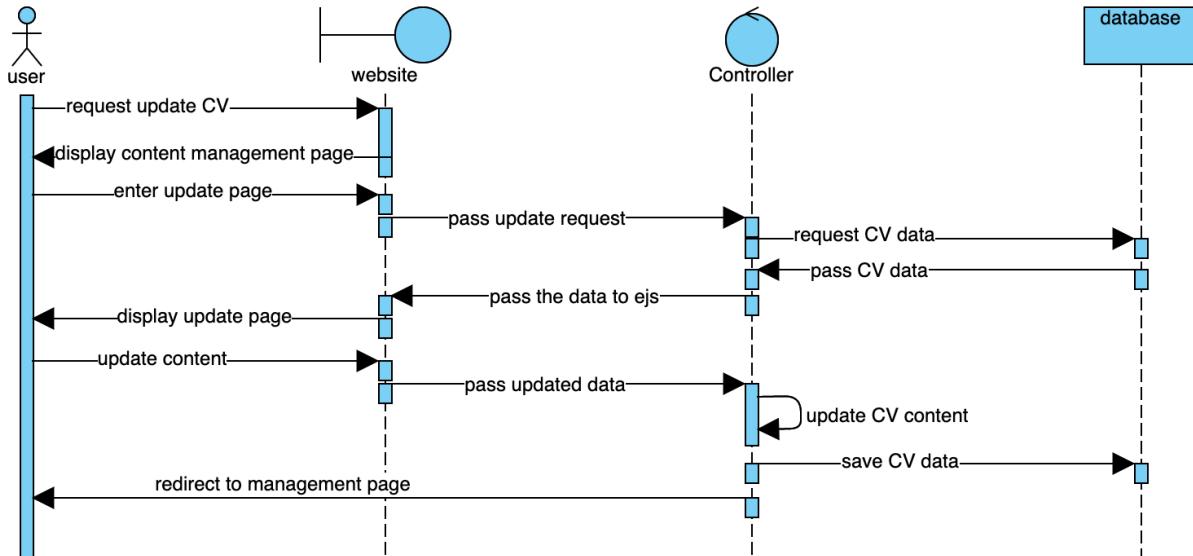
To add the reference section, the user needs to enter the reference page and the user interface will display the work section page for the user. The user can fill in the form with references. If the input space is not enough, the user can request the user interface for another input form. The user interface will display another form below the original one for the user to input data. If the input space is enough for the user, the user can submit data. The user interface will pass data to the server. The server will update the record of the reference of the corresponding CV and save data in the database.

4.2.10. Choose Template



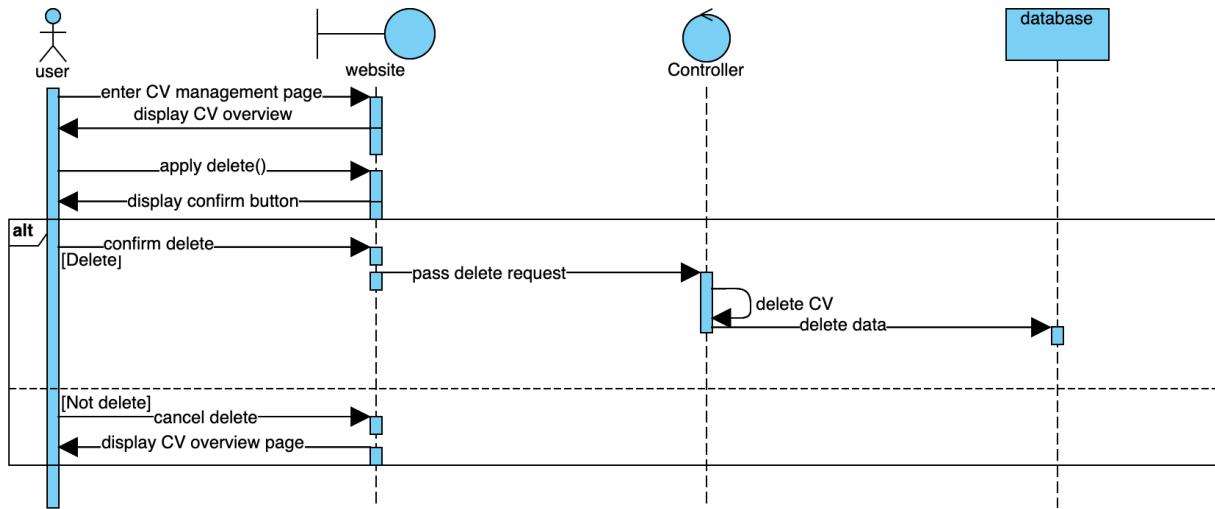
To choose the template of the CV, the user needs to enter the choose-template page. The user interface will display the page with preview links of different templates. The user can click the preview links to check the CV. The user interface will pass the request to the server. The server will get the data of the CV and generate the preview page with the corresponding template. The user interface will display the preview page for the user. The user can confirm the template after preview. The user interface will pass the template choice to the server. The server will save the CV and the template choice in the database.

4.2.11. Update CV



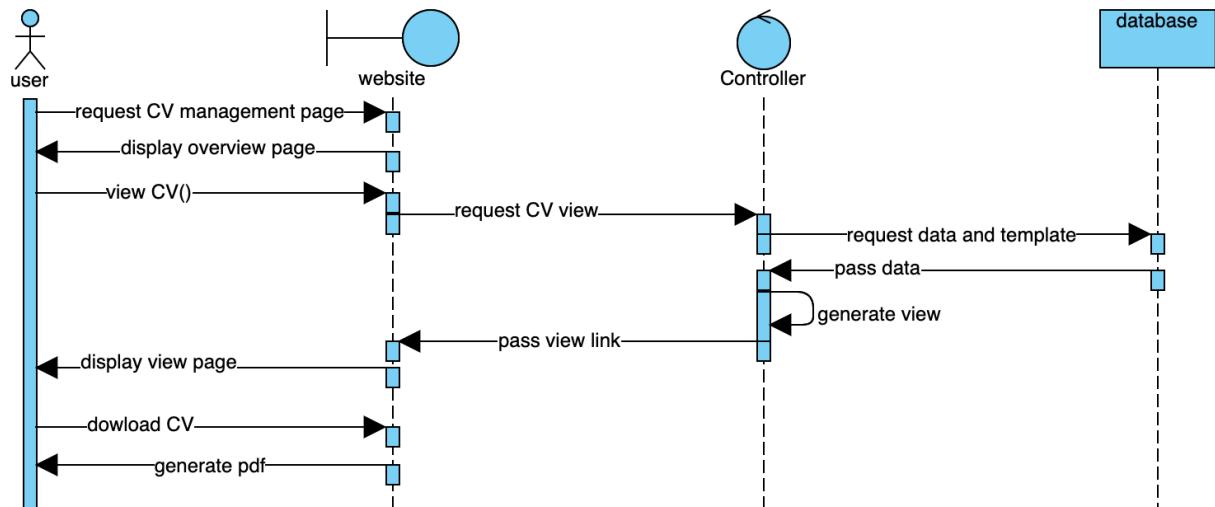
To update the CV, the user needs to send a request by pressing the update button. The user interface will display the content management page. The user can enter this page and send an update request. The user interface will pass the request to the controller side. The controller will get data from the database and pass the data to the user interface so that the user can view the current version of the CV. The user can edit the content and save it. The user interface will pass the updated data to the controller. The controller will update CV content and save it in the database. After that, the system will redirect the user to the management page.

4.2.12. Delete CV



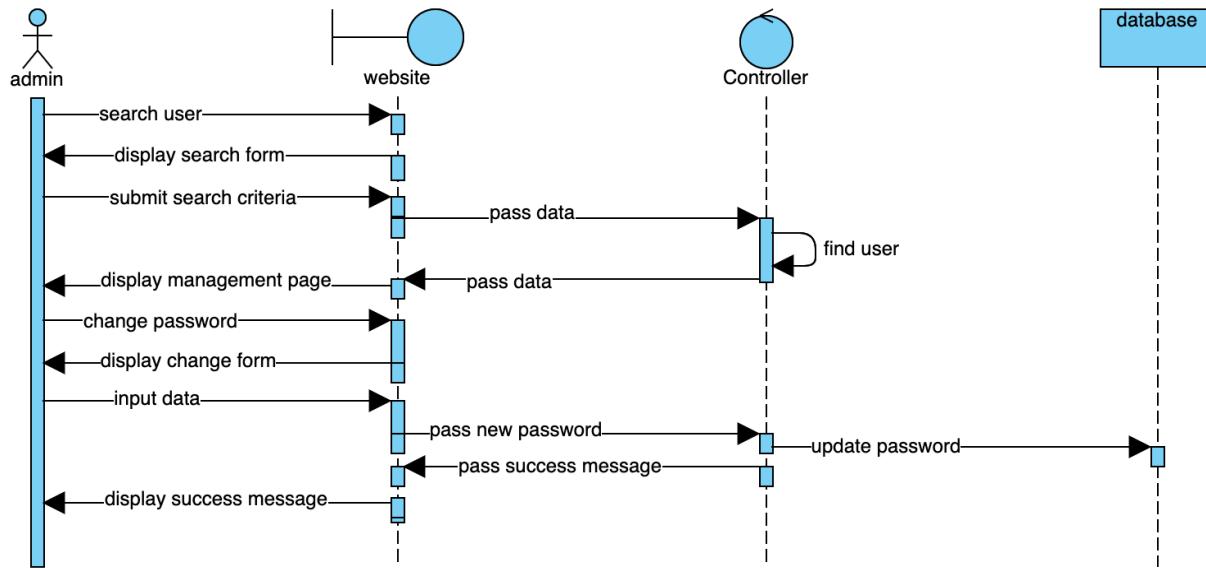
To delete a CV, the user needs to enter the CV management page. The user interface will display the page for the user. The user can click the delete button on the right-hand side of the page. Then the user interface will pop up a window for the user to double confirm. If the user is determined to delete the CV, the user interface will pass the request to the controller, and the controller will delete the CV. If the user cancels the delete operation, the user interface will not pass the request and will display the management page.

4.2.13. View CV



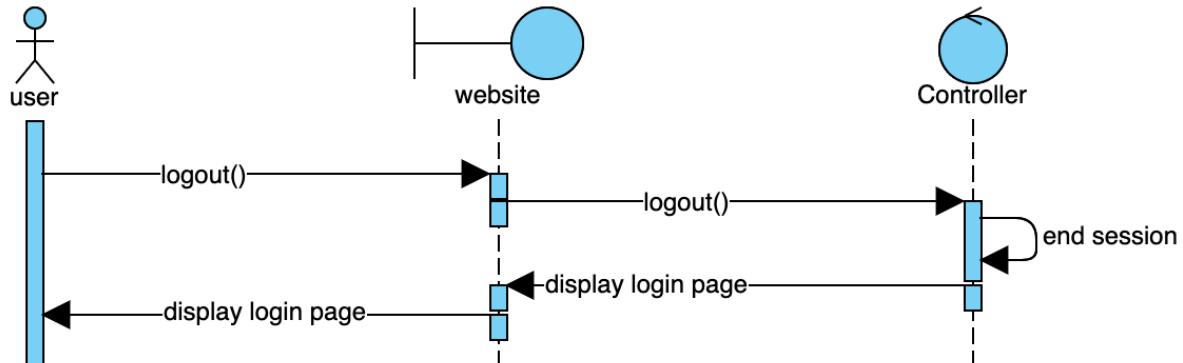
To view the CV, the user needs to request the CV management page. The user interface will display the overview page. The user can click to request the view and the request will be sent to the controller. The controller will request data and template of the CV and generate the view. Then, pass the page to the user interface. The user can view the CV. If the user wishes to download the CV, the user can click the download button and the user interface will generate the pdf for the user.

4.2.14. Change Password



The admin can change the password in the admin centre. The admin can request to search the user and the user interface will display the search form for the admin. The admin can submit searching criteria and the user interface will pass the data to the controller. The controller will find the user and send the data to the user interface. The user interface will display the management page to the admin. The admin can click the change password button and the user interface will display the change form. The admin can input the user password and submit it. The user interface will pass the new password to the controller and the controller will update the password and give a success message to the user interface. The user interface will display the successful message to the admin.

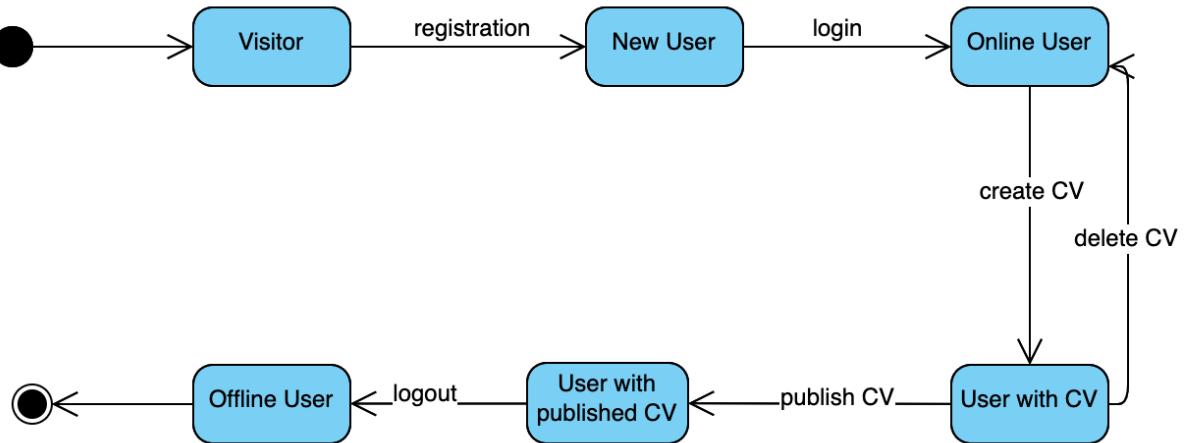
4.2.15. Logout



To log out of the system, the user needs to click the logout button and the user interface will pass the logout request to the controller. The system will end the session of the user and redirect the user to the login page.

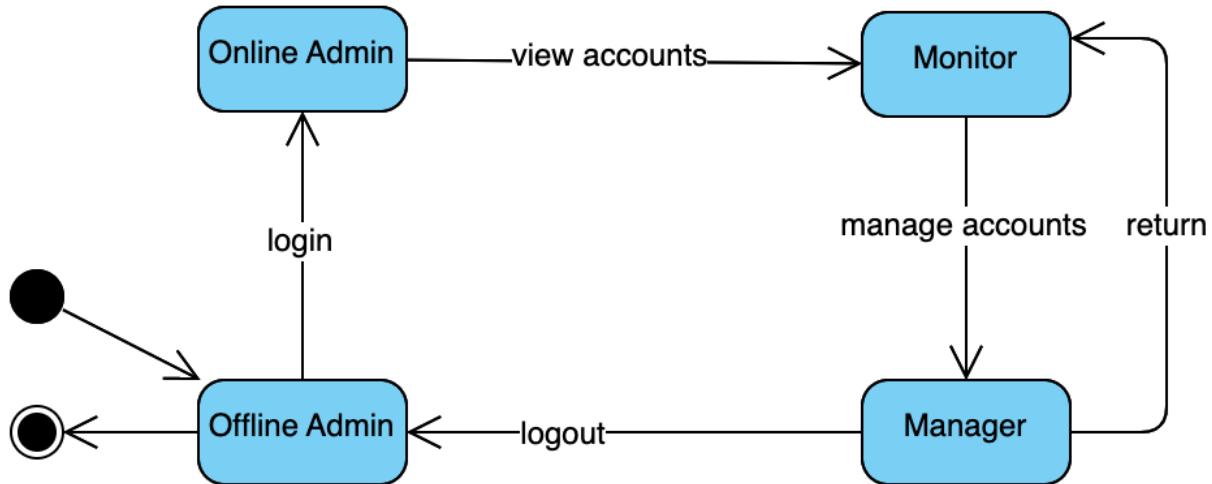
4.3. State Chart

4.3.1. User



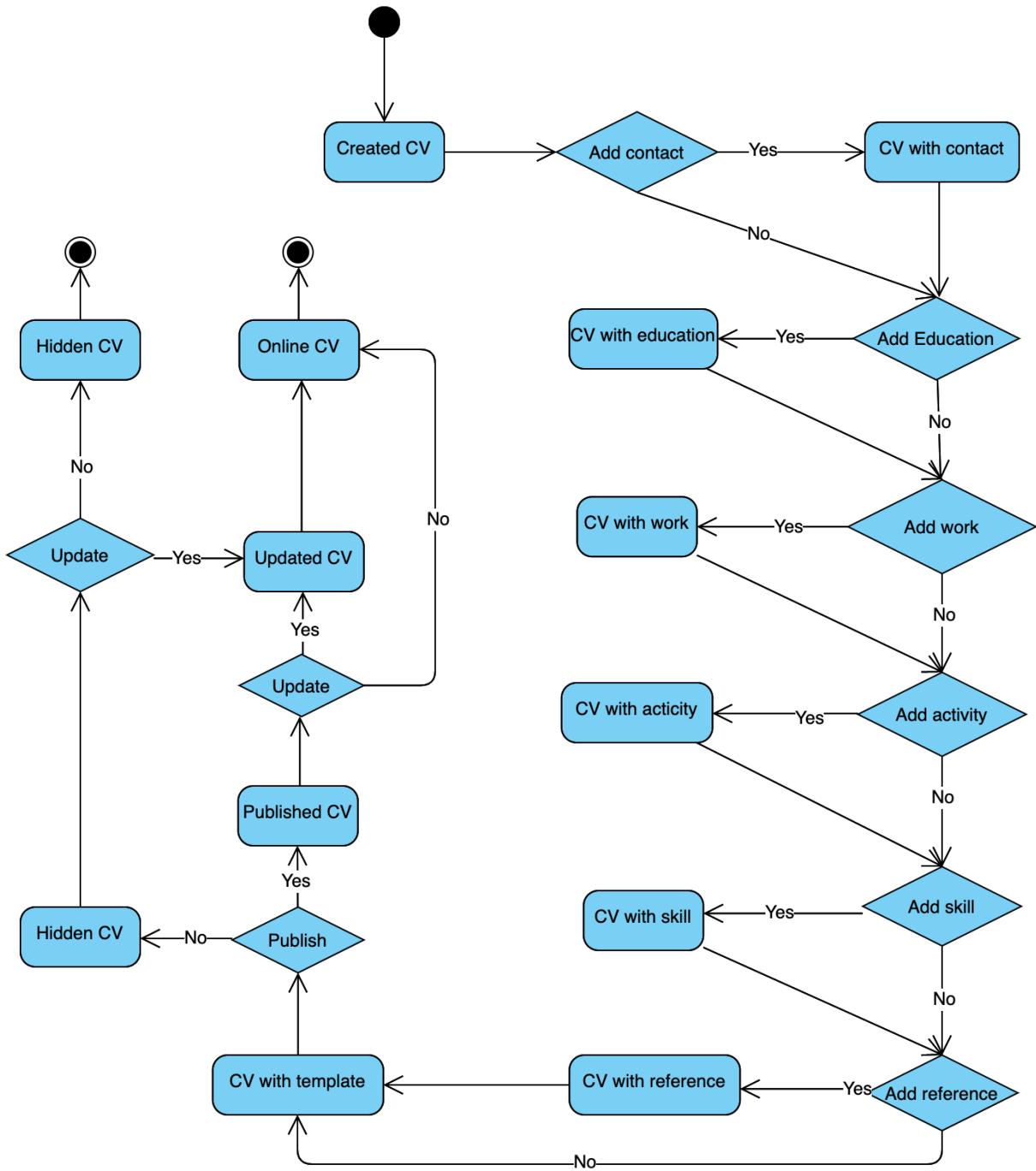
Before registration, persons who view the website is visitors. After registration, the person is a new user of the system. After logging in, the user is an online user. Online users can create CVs to become a user with CVs. If the user deletes all the CVs, the user will become an online user without a CV. After creating a CV, the user can publish CVs and become a user with published CVs. When logging out of the system, the user will become an offline user.

4.3.2. Admin



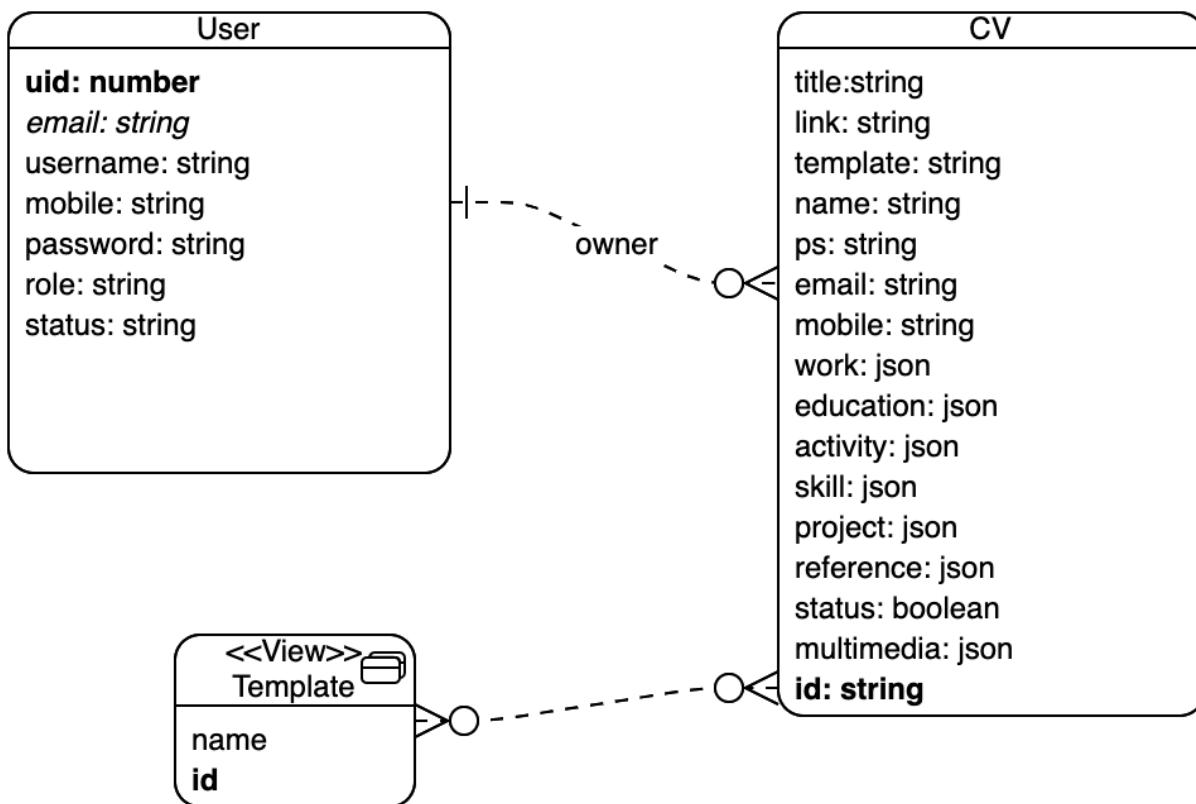
Before logging in to the system, the admin can become an online admin from an offline admin. The online admin can view accounts and play the role of monitor of the system. The admin can also play the role of manager when managing accounts. After logging out of the system, the online admin will become an offline admin.

4.3.3. CV



After creation, the CV is empty. It needs to be filled by the user. If the user adds a contact section, the CV will become a CV with contact. If the user skips the contact section, the CV will keep the contact section empty. If the user inputs education information into the CV, the CV becomes the CV with education. If the user inputs work experience into the CV, the CV becomes the CV with work. If the user inputs activity experience into the CV, the CV becomes the CV with activity. If the user inputs skills into the CV, the CV becomes the CV with skills. If the user inputs reference into the CV, the CV becomes the CV with reference. After the user chooses the template for the CV, the CV becomes a CV with the template. When the user publishes the CV, the CV will become a published CV. If the user chooses not to publish the CV, the CV is a hidden CV. If the user decides to update the CV, the CV will become an updated CV.

4.4. Database Design and Physical Data Model



5. Systems Implementation

5.1. Use of Software/Library

1. Visual Studio Code

Visual Studio Code is a streamlined source-code editor that supports development operations like debugging, task running, syntax highlighting and version control. It is a tool that developers need for a quick code-build-debug cycle. This software supports many programming languages like Python, JavaScript and Java. In this project, the most frequently used language is JavaScript, thus Visual Studio Code is a suitable development platform.

2. Node.js

Node.js is an open-source server environment that can run on various platforms like Windows, Mac OS, Linux, etc. Node.js runs single-threaded, non-blocking, asynchronous programming so it uses memory efficiently. It uses JavaScript on the server. It also supports retrieving client data, opening files on the server and returning the content to the client.

3. Sails.js

Sails.js is a free and open-source model-view-controller (MVC) web application framework. It is developed on top of Node.js and Express.js. It provides a simple data access layer that works with any database. It supports MySQL, MongoDB, PostgreSQL, local disk, etc. It provides auto-generated REST-ful APIs and Sockets. This project is built on the basis of Sails.js.

4. Bootstrap

Bootstrap is an open-source front-end framework used to create websites and web applications. It provides features for HTML, CSS templates and UI interface elements. It also provides JavaScript plugins for users. In this web application, Bootstrap is used to customize the web pages for a better user experience.

5. Font Awesome

Font Awesome is an Internet icon library and toolkit used by millions of developers, designers and content creators. It provides free icons that can be customized with CSS to have a more beautiful user interface.

5.2. System Constraints

5.2.1. CV Design Limitation

At present, this project only provides limited CV templates and users can only use the system according to the designed process. The users cannot move the different sections of the CV to other parts and cannot determine the order of different sections by themselves. For example, the education part must appear before the work experience part. Therefore, this online CV system may limit the creativity of users.

5.2.2. Database Storage

This system now only relies on the Sails software and the database is the internal database of Sails. There is no other hardware, software or configuration for support. The system may be overloaded if users create too many CVs. The system can rely on other databases in the future.

5.2.3. Security

Currently, there is no specific way to protect the data input by the users. There is no encryption or other approaches in the system apart from the account password, so the CV data may be changed or attacked easily. There is a need for the system to build a safer environment in the future.

5.2.4. User Communication Limitation

There is no internal communication function for users to communicate with the admin in the system now. Users cannot send messages to admins and admins cannot send messages to users apart from emails. This is inconvenient for the account management works, thus this system may need to have a message function in the future.

5.2.5. Hard to Get in Touch with Recruiters

There is no recruiter in the system now so the users can only ask the recruiters to view their CVs through the links. Users can only send their CV links after finding the potential recruiters. Recruiters cannot search for the candidates by themselves so there are fewer opportunities for the users to be exposed to recruiters. This system may include a recruiter in the future to make it easier for recruiters to hunt for candidates and reduce their workload.

5.3. Test Plans

5.3.1. Test Strategies

1. Objective

This test plan is designed firstly to check whether the functionality of the online CV system works as expected without errors or bugs in the real business environment. Secondly, this test plan aims to check whether the user interface of the system works as expected and whether it can meet the requirements of users conveniently.

2. Test scopes

The functions and internal interface of the system.

Security testing and logical testing is not included in the test plan.

3. Hardware & software requirements

a. Recommend operating system

Windows: 7 or above

Mac: 10.14 or above

b. Hardware requirements

Processor: Minimum 1 GHz; Recommended 2GHz or more

Hard Drive: Minimum 32 GB; Recommended 64 GB or more

RAM: Minimum 1GB; Recommended 4 GB or above

Ethernet connection or wireless adapter

c. Recommend software

Visual Studio Code

Google Chrome

Safari

Microsoft Internet Explorer

5.3.2. List of items and features to be tested

1. UserController

Ref ID	Item to test	Test description
U1	UserController - login	Login successfully Login with error - “User not find” Login with error - “Wrong password” Generate session Direct to user homepage
U2	UserController - register	Register account successfully Register with error - “email already registered” Register with error - “Password and confirm password do not match”
U3	UserController - logout	Destroy session after logout Redirect to homepage
U4	UserController - deleteUser	Delete user Direct to account management page
U5	UserController - changePassword	Error - “User not find” Change password successfully Direct to account management page
U6	UserController - searchUser	Find all users Find user by email Find user by username
U7	UserController - paginate	Go to display user list page successfully

2. CVController

Ref ID	Item to test	Test description
C1	CVController - createCV	Create CV successfully Record saved in the database Add association with the user Go to create contact section page
C2	CVController - CVcontentManagement	Find CV with error - “CV not found” Find specific CV Direct to the content management page
C3	CVController - addContact	Error - “CV not found” Get the view of creating content Direct to the page of creating education
C4	CVController - addEdu	Error - “CV not found” Get the view of creating education Direct to the page of creating work
C5	CVController - addWork	Error - “CV not found” Get the view of creating work Direct to the page of creating activity
C6	CVController - addActivity	Error - “CV not found” Get the view of creating activity Direct to the page of creating skill
C7	CVController - addSkill	Error - “CV not found” Get the view of creating skill Direct to the page of creating reference
C8	CVController - addRef	Error - “CV not found” Get the view of creating skill Direct to the page of choosing template
C9	CVController - chooseTemplate	Error - “CV not found” Get the view of choose template Save the template choice successfully
C10	CVController - updateContact	Error - “CV not found” Get the view of update contact Update contact successfully Redirect to content management page
C11	CVController - updateEdu	Error - “CV not found” Get the view of update education Update education successfully Redirect to content management page
C12	CVController - updateWork	Error - “CV not found”

		Get the view of update work Update work successfully Redirect to content management page
C13	CVController - updateActivity	Error - “CV not found” Get the view of update activity Update activity successfully Redirect to content management page
C14	CVController - updateSkill	Error - “CV not found” Get the view of update skill Update skill successfully Redirect to content management page
C15	CVController - updateRef	Error - “CV not found” Get the view of update reference Update reference successfully Redirect to content management page
C16	CVController - updateTemplate	Error - “CV not found” Get the view of choose template Save the template choice successfully Redirect to content management page
C17	CVController -overview	Find the user with error “user not found” Find the user with populate CVs successfully
C18	CVController - deleteCV	Find the CV successfully Delete the CV successfully Redirect to CV overview page
C19	CVController - viewCV	Error - “CV not found” Get the view of the CV
C20	CVController - previewDark	Error - “CV not found” Get the view of CV with template “Dark”
C21	CVController - previewWhite	Error - “CV not found” Get the view of CV with template “White”

5.3.3. Passing or failing criteria for items/features

1. UserController

Test item	Pass criteria	Fail criteria	Pass/Fail
login	Display login page Login successfully and redirect to homepage Generate session for the user Display error message for invalid email/password	Fail to display register page Fail to login and redirect to homepage Fail to generate session Fail to display the error message for invalid input	Pass
register	Display register page Register successfully, create the user account and redirect to login page Display error message for invalid email/password	Fail to display register page Fail to create an account and redirect to login page Fail to display the error message for invalid email/password	Pass
logout	Logout successfully and redirect to welcome page Destroy the session	Fail to logout and redirect to welcome page Fail to destroy the session	Pass
deleteUser	Delete user and redirect to user overview page	Fail to delete the user and redirect to user overview page	Pass
changePassword	Change the password of the user and redirect to user overview page	Fail to change the pass of the user and redirect to user overview page	Pass
searchUser	Find all users Find user “user1” Find user “admin1” Direct to search result page	User not found User not found User not found Fail to direct to search result page	Pass
paginate	Find users with count	Fail to find users with count	Pass

2. CVController

Test item	Pass criteria	Fail criteria	Pass/Fail
createCV	CV created successfully and direct to create contact page	Fail to create CV and direct to add contact page	Pass
CVcontentManagement	Show a table with links to update the content of different sections of the CV	Fail to show a table with links to update the content of different sections of the CV	Pass
addContact	Create contact of the CV successfully Direct to create education page	Fail to create contact of the CV Fail to direct to create education page	Pass
addEdu	Create education of the CV successfully Direct to create work page	Fail to create education of the CV Fail to direct to create work page	Pass
addWork	Create work of the CV successfully Direct to create activity page	Fail to create education of the CV Fail to direct to create activity page	Pass
addActivity	Create activity of the CV successfully Direct to create skill page	Fail to create activity of the CV Fail to direct to create skill page	Pass
addSkill	Create skill of the CV successfully Direct to create reference page	Fail to create skill of the CV Fail to direct to create reference page	Pass
addRef	Create reference of the CV successfully Direct to choose template page	Fail to create reference of the CV Fail to direct to choose template page	Pass
chooseTemplate	Save the template choice of the CV	Fail to save the template choice of the CV	Pass
updateContact	Display contact page of the CV with current content Update the contact context of the CV successfully and redirect to CV content management page	Fail to display contact page of the CV with current content Fail to update the content of the CV and redirect to CV content management page	Pass
updateEdu	Display education page of the CV with current content Update the education context of the CV successfully and redirect to CV content management page	Fail to display education page of the CV with current content Fail to update the education content of the CV and redirect to CV content management page	Pass
updateWork	Display work page of the CV with current content Update the work context of the CV	Fail to display work page of the CV with current content Fail to update the work content of the	Pass

	successfully and redirect to CV content management page	CV and redirect to CV content management page	
updateActivity	Display activity page of the CV with current content Update the activity context of the CV successfully and redirect to CV content management page	Fail to display activity page of the CV with current content Fail to update the activity content of the CV and redirect to CV content management page	Pass
updateSkill	Display skill page of the CV with current content Update the skill context of the CV successfully and redirect to CV content management page	Fail to display skill page of the CV with current content Fail to update the skill content of the CV and redirect to CV content management page	Pass
updateRef	Display reference page of the CV with current content Update the reference context of the CV successfully and redirect to CV content management page	Fail to display reference page of the CV with current content Fail to update the reference content of the CV and redirect to CV content management page	Pass
updateTemplate	Display template choices with preview links Update the template choice of the CV	Fail to display template choices with preview links Fail to update the template choice of the CV	Pass
overview	Display the CV overview page of the user	“User not found”	Pass
deleteCV	Delete the CV successfully	Fail to delete the CV or “CV not found”	Pass
viewCV	Display the CV	Fail to display the CV or “CV not found”	Pass
previewDark	Display the preview of template Dark	Fail to display the CV with template “Dark”	Pass
previewWhite	Display the preview of template White	Fail to display the CV with template “White”	Pass

5.3.4. Test Deliverables

1. Black-box Test

Black-box test focuses on the input and the output of the software. It ensures the functionalities of the system works well. Test cases are attached in the appendix.

2. Stress Test

BrowserStack is used as the stress test tool in this project. The result is passed.

3. Browser Test

The system can run properly in the following browsers.

Operating System	Browser	Display properly	Function properly
Mac OS 11.0.1	Google Chrome	Pass	Pass
Mac OS 11.0.1	Safari	Pass	Pass
Windows 10	Microsoft Edge	Pass	Pass

6. Discussions, Contribution and Conclusion

6.1. Discussions

6.1.1. Current Development

This system has been developed to fulfil the requirements of creating and viewing CV online like the functions stated in the previous sections. Users can create their CVs according to instructions and send their CV links for others for viewing.

6.1.2. Future Development/ Enhancement

1. More user-friendly UI design

During the UAT, some users gave reflections about the design of the user interface. In the future, the user interface can be modified with more creative pictures and backgrounds. The input forms can also be improved with automatic associations to help the users generate ideas.

Some users expressed the wish of having a more convenient operation method. Currently, we only provide the interaction by clicking and inputting. We may develop the functions like drag files to upload drag to change the order of the sections of CV in the future.

2. More choices of templates

The number of templates in the system is limited now but users prefer to have more templates to suit their personalities and the job nature of their target posts. A numerous number of beautiful templates can be a selling point of the system, so we can design more templates to attract users.

3. Security

The link and data of CVs are unencrypted, which may cause security issues. Thus, we may need to develop more features to ensure data security in the future.

The accounts are linked with emails at present and there is only one login checking. We may develop the functions of login certification through emails or mobiles in the future to ensure account security.

4. Recruiter in the system

There is only two types of users in the system, user and admin. We may help the recruiters to get into the system. Recruiters can enter the system and find the candidates they need. Recruiters can also bring opportunities for the users. Users who use the system will have more chances to be seen by the recruiters and recruiters and get in touch with talent more easily. This will provide a win-win situation for both talents and recruiters.

5. Data analysis

We can develop data analysis functions for admins to let them know more about the usage of the system. For example, we can make a summary about the usage of a different template. The admins can know what template is used most frequently and design more templates with similar styles. This function can also be used for user recommendations that users can know which template is preferred by others and they may choose the more popular ones.

6.1.3. Challenge of the Project

1. System design

Having a good design is the first step of a project. Too many ideas were crushed into my head when I got the topic, so I designed many redundant features at the beginning. I bury the key functions in a mess of ideas and lost focus. It took me quite a while to find the main point of the system and sharpen my ideas.

2. CV design

It is hard to figure out the market expectation at first and I studied many tips and instructions about writing CVs before starting the work. I interviewed some recruiters for advice and they told me they prefer more concise CVs. After the communication with them, I found that many CV examples I can search online are not really preferred by recruiters so I have to adjust the pages and styles according to references to better fulfil the expectations. However, as a student I do not have much experience in writing CVs, I can only try to design more useful templates.

3. Development

Coding is difficult for me. It is hard for me to build error-free functions before the deadlines set by myself. I was stuck many times when writing the functions and cannot push the system any further, which wasted lots of time. I spent plenty of time searching for tutorials and asking for consultations, but I still cannot build simple and effective functions that totally fit my requirements smoothly.

6.2. Analysis and Design Contributions

This system aims at helping talents create CVs online to get a chance to be noticed by recruiters. There are many CV builders on the internet now so it is hard to find a new selling point. The concept of this system is more like a personal web page. The users can build pages to introduce themselves. Recruiters can view the personal pages to know the users and consider whether the job posts are suitable for them. There is no need for the recruiters to collect and save CVs in the folder, they can just collect the links and view the CVs when needed.

6.3. Implementation Contributions

The system is built by myself. I used VS code and Sails as the development tools, the database used is provided by Sails. I used some open-source materials and libraries for reference and asked our teaching assistant for advice. Those suggestions helped me to build a basic frame of the system and I implemented the system by myself.

6.4. Conclusion

6.4.1. The system

This online CV system is a platform to write CVs. It provides two interfaces for users and admins.

For users, the system aims to give users ideas about how to write CVs and provide a platform to put their CVs online. This system provides simple and useful tutorials for new users. Students, especially those who lack experience in writing CVs can benefit from this system. Users can write, edit, choose templates and preview the CV. This system provides the users with a platform to practice that users can read the instructions and create their own CV.

For admins, they are in charge of the system, they can manage the accounts and upload more templates for users to use. Admin is an essential part of the system.

However, there are many improvement areas of the system. The system should aim at improving user experience and provide more CV options for the users to introduce themselves with more creativity.

6.4.2. Self-reflection

I am really happy to build the system at last, although there are still many regrets in building the system. I am not a technical person so coding is always a big challenge for me. I had a great blueprint at the beginning of the project and was optimistic about coding all the features. It took me much time to design the system. However, I experienced huge setbacks when developing this system. I cannot realize the functions I designed so I sunk into self-doubt and desperation, thinking about giving up. However, the deadlines pushed me to move forward. I spent plenty of time dealing with the depression and asked the psychological counsellor for help to give me a stable mental condition to continue developing the project.

At last, I had to cut some functions of the system to spend more time on key functions. It is a great step for me to develop a system that can run and be used by others. This project is not only a challenge for my coding skills and time management ability but also a mental sharpening process. I had a more clear self-cognition and I obtained ideas about adjusting my career path after this project.

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