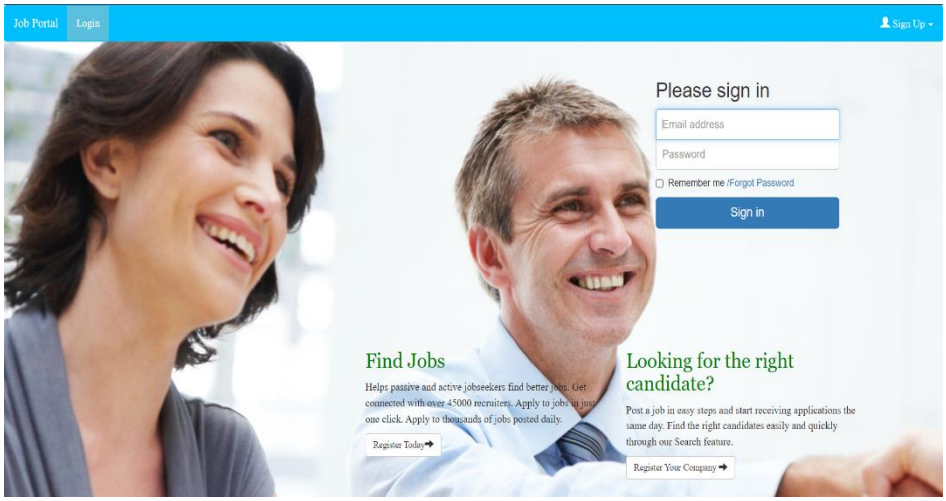
FINAL PROJECT

Subject: Software Engineering

Lecturer: Aida Bitri

Lecturer: Edison Reshketa

Project Title: *"Job Portal"*



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June 03, 2023

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1. INTRODUCTION

1.1 Project Aim/Purpose

The purpose of our project has been to develop a job-seeking portal we have decided to name, “Job Portal”. Our group is made out of five members (Adela Spaho, Ana Maria Hysa, Dea Rucaj, Kejti Vakeflli, Xhesi Qordja), where each one is responsible for writing different parts of the codeneeded for creating this application. We strive to create a platform with user friendly functionalitiesas well as an aesthetic interface, where people in need of finding a way of life can discover themselves. “Job Portal”, will be able to give them free access to search for jobs, post resumes, andresearch companies, giving people an insight into new opportunities.

1.2 Objectives

Sometimes, it may prove to be quite overwhelming for someone to come upon a job position catered to their ideal career specifications, or even finding positions which come to accordance with their resume qualifications. “Job Portal”, must be the bridge which will help connect employees and employers all together, in just only one platform. By using “Job Portal”, you gain the opportunity of expressing your potential, qualifications and ambitions, prove that you can contribute your knowledge to the benefit of the organization/firm which will draw their interest. This website will make job search as easy as possible. “Job Portal”, will be organized very efficiently, by letting users easily find what they are searching for, and therefore, where they wantto see themselves in. These easily accessible functionalities aim to give solutions even to the mostindecisive and insecure unemployed individual. A job is always easier when you first of all, are prepared for what awaits you, and secondly, you end up doing something you are passionate about.

1.3 Application Description

"Job Portal", is a web application that will be structured in a very effectively accessible way to provide user friendly services to everyone choosing to utilize it. We are going to use PHP programming language and MySQL to create this application. This initiative is in charge of maintaining records for both employers and job seekers. Jobseeker and Employer are the two modules that make up the Job Portal system. Employers-related functions are offered by the Employer Module. Businesses/Firms can publish job vacancy information and update it as needed. They both benefit from the application by fulfilling each-other's needs, for employment and employees.

1.4 Team Member's Responsibilities

Kejti Vakeflli (Team Leader for group Job Portal) → PHP and JavaScriptAdela Spaho → PHP and JavaScript

Ana Maria Hysa → PHP and JavaScript

Dea Rucaj → Database

Xhesi Qordja → Database

2. USER REQUIREMENTS AND APPLICATION SPECIFICATIONS

2.1 Requirement Elicitation and Analysis

2.1.1 *Requirement Discovery*

For this part of the project, we decide that conducting an interview with a few of our unemployedfriends and family members as well as people in our circles who happen to be business owners, considering them as the stakeholders we will be questioning to elicit the answers we need in orderto fill in an outline of needs and requirements of our webpage.

The interview in word, was held toinitially concretize, on one hand, the hardships our stakeholders face while trying to find new jobpositions accommodated to their qualifications, the salary they require, the position they want etc.And on the other hand, the hardships businesses face when trying to find employees who fit to their standards and requirements.

All this information helped clarify what is expected of Job Portal in order for it to perform in favorof such people, simplifying the quest of searching, from both accounts of job-seeker and employer.

2.1.2 Requirement Classification and Organization

We have concretized the basis of what our website will need to consist of, fore the bare minimumof requirements that need to be met in any other standardized website. The stakeholders will be entering the site from the perspective of user uploading the job position and from the perspective of user browsing, selecting and sending their application for those positions. In this case when signing-in/logging-in to the site we must distinguish the account of the job-seeker and employer.

Firstly, let’s take the case of users entering the site as job-seekers. After choosing the option of sign-in/log-in as the account of job-seeker they will be faced with

their homepage. If it is the caseof entering for the first time, they will be expected to be able to create a form with their name, surname, email and other personal information that will be uploaded in our database to then be registered as their profile. This form may hold other details of the persons professional merits and other personalized information. Apart from this, they should be able to browse through the page reading, filtering through the job positions, locations and other requirements they may have. Secondly, when considering that our user enters his account as employer, similar to the aforementioned user, after choosing the option of sign-in/log-in as the account of employer, they will be faced with their homepage. In the case of them being a first-time user, they will be expectedto be able to fill a form for their business where they will be expected to fill in their company name, email, contact information, and other business-related information that will be uploaded tomour database and thus creating a business profile as well. When posting a new job, they need to upload a form containing the vacancy in question, the employee benefits, work requirements, jobconditions and other relevant information needed before posting it. Just as job-seekers have accessto their profiles, they will have access to the applications send to them.

The relationship between the two cases of users is clear, both of them registering their profiles creating their own rows of data for our database system which stores their info until called when summoned. So, the forms submitted with their personal information will share nearly identical fields needed to fill before pressing the submit button. The access to these profiles will be also given in both accounts. Both these future-employees and future-employers will make their choicesbased on how well their requirements will be met by their other pairs' qualifications.

2.1.3 Requirement Prioritization and Negotiation

The most undesirable outcome would be in the case where we have all the needs and requirementsof our stakeholders but not reflecting upon them to create a solution to the problems, they face using the traditional means of job hunting and employing the people you truly want. So, it is especially important to focus on what requirements we will be prioritizing above all the rest and create our core website elements. Functions that are a standard for every other example of good websites, similar to what we want to achieve, should be prioritized above the rest. Below you willfind the main features, without this system wouldn't be able to operate:

— *Log-in/Sign-in*

It is important that both job-seeker and employer have their own accounts when entering the page, whether their profile is already uploaded to the database in the case of log-in, or when they are a first-time user and will register their information to be uploaded to the server's database in the case of sign-in to the site.

— *Registration forms*

The form both entities will need to submit with their personal information to create their personal profiles to the site.

— *Profiles*

When the employers or future-employees enter the site, they should be able to check on each- others credentials, and this will only be possible when we have created a functional database thatwill store the information filled upon registration.

— *Job updates*

The employers will need a specialized button that will allow them to create a new job profile that will appear to job-seekers in their main-page view.

— *Job forms*

When the employers select the button of job-update they will be presented a form with the necessary fields that will hold information of descripting the vacancy they will upload

bysubmitting it for the database system to read and store in its tables.

— *Application submission*

After the job-seeker has filtered their preference and have made the decision of which vacancybetter fits their requirements, they will have the option of applying for that position by submittingtheir profiles to the business, so they can be considered for the position.

2.2 Requirement Specification

- *User and System Requirements*

Overall requirements for the accounts of employer and job-seeker are:

Employer:

— Sign-up/Log-in

— Creating Profile

— Job updates

Job-seeker:

— Sign-up/Log-in

— Creating Profile/CV

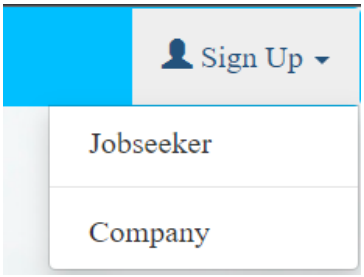
— Job Search

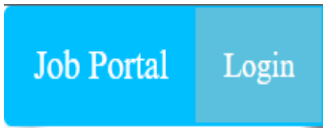
— Sending Application

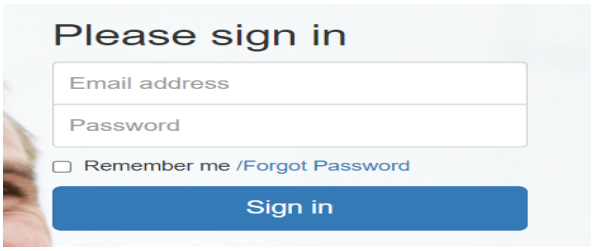
2.2.1 User Requirements:

1) *Sign-up/Log-in*

We have established since the beginning that we need to select between the accounts of job- seeker and employer when entering the page. If the profile exists in the database the credentialsentered when registering will be called to upload the profile when entering as log-in. If they are a first-time user and will register their credentials when signing-in to the site.





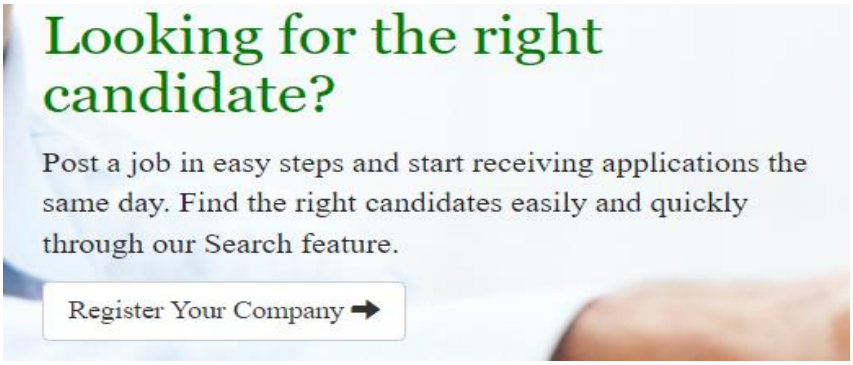


2) *Job Posting*

The employers will need to create a new job profile that will appear to job-seekers. They will be required to fill the appropriate form withholding the information on description of the new position that will then be registered in the database table. Their info of job position to be filled will be necessary to profile the applicants.

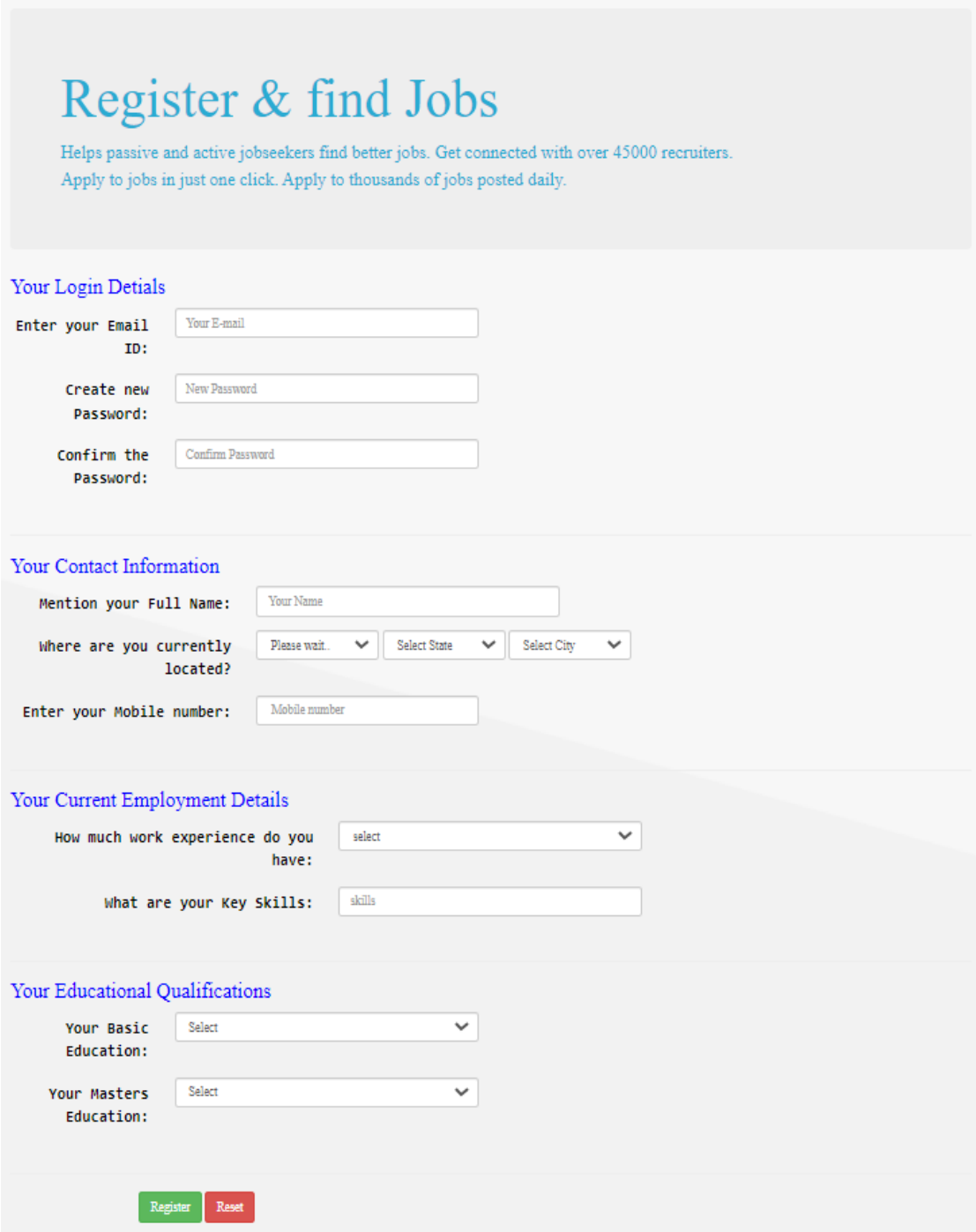
3) *Sending Job Applications*

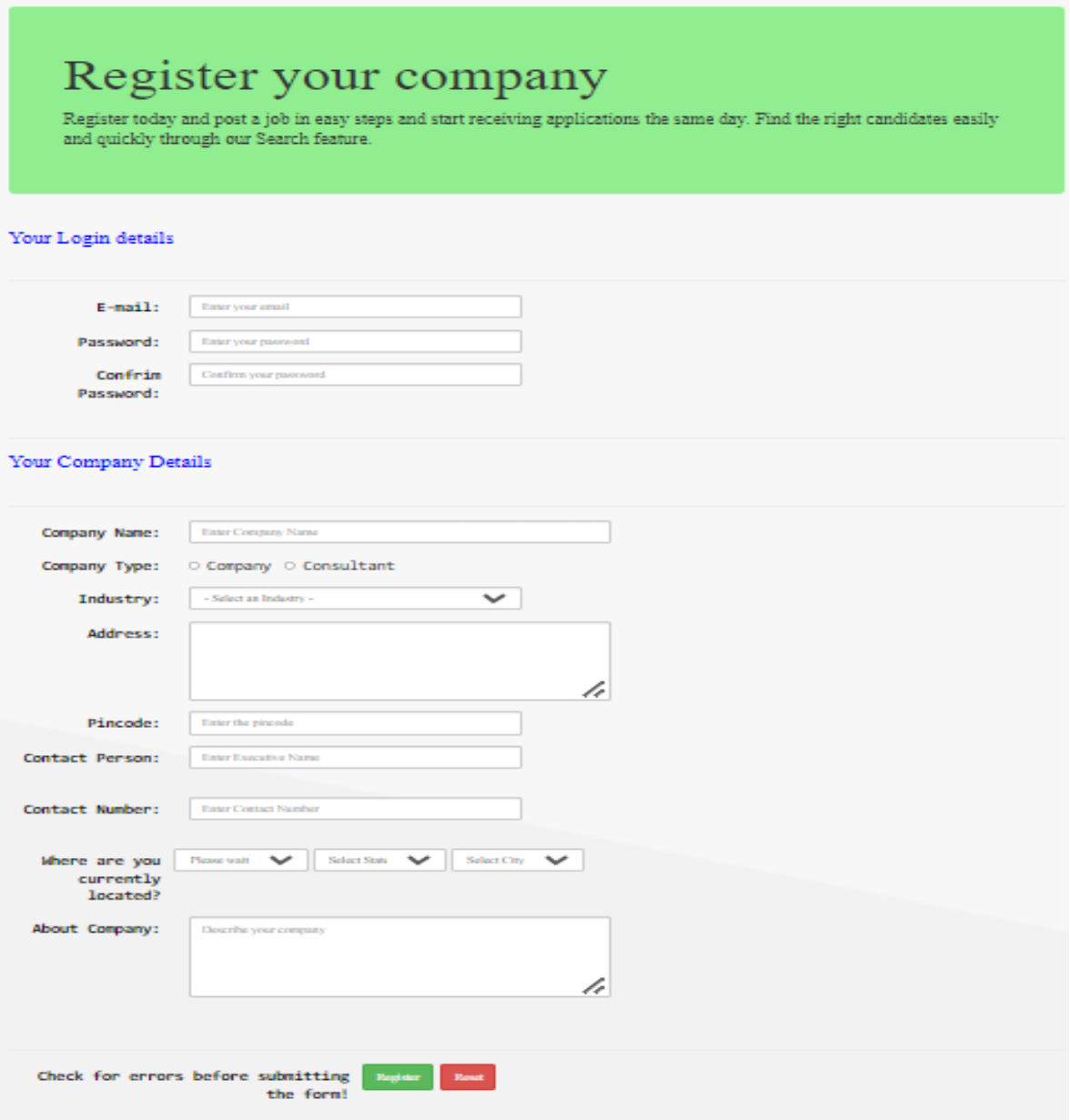
The Job-seeker will be able to submit their application to the job offers posted by the employersthrough submission.

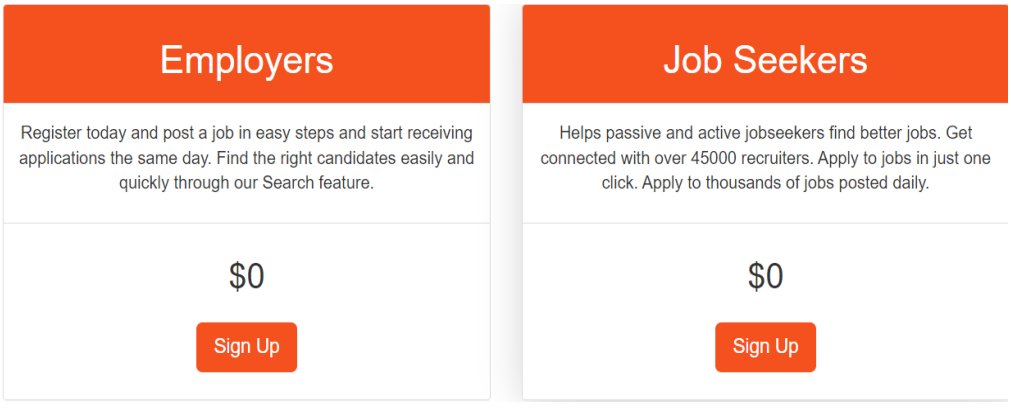


4) Creating Profiles as Employer or Job-seeker

Bot the Employer and the Job-seeker will have access to form that will be filled with their personal information and preferential requirements and qualifications that will be uploaded astheir profiles in the sites main-page.




Register your company
Register today and post a job in easy steps and start receiving applications the same day. Find the right candidates easily and quickly through our Search feature.
Your Login details
E-mail:
Password:
Confrim Password:
Your Company Details
Company Name:
Company Type:
Company
Consultant
Industry:
- Select an Industry -
Address:
Pincode:
Contact Person:
Contact Number:
Where are you currently located?
Please wait
Select State
Select City
About Company:
Describe your company
Check for errors before submitting the form!
Register
Reset


Employers
Register today and post a job in easy steps and start receiving applications the same day. Find the right candidates easily and quickly through our Search feature.
$0
Sign Up
Job Seekers
Helps passive and active jobseekers find better jobs. Get connected with over 45000 recruiters. Apply to jobs in just one click. Apply to thousands of jobs posted daily.
$0
Sign Up

2.2.2 System Requirements:

1) Sign-up/Log-in

— *When clicking on the sign-in/log-in, user will be presented with the option ofentering as an employer or job-seeker, this will determine their user-type in the page.*

— *Then they will be presented with a table before they can access the page.*

— *The table will hold their credentials such as name, surname, email, password, etc.*

— *Existing profiles has these variables already saved in the system, because they have already registered in the page and as such are recorded in the database.*

— *First-time users will have to correctly enter credentials after creating their profiles.*

log_id	email	password	usertype	status
14	akshay@gmail.com	$2y$10$3/cBmurjZzBYUkaLYE.Y..skkTdBT/YVCZb51Q3yWx7...	jobseeker	1
18	info@infosys.com	$2y$10$/TP7ishP6SRCroPNfWcVqO1V0mMH47X.Qsft1u/Ed9x...	employer	0
20	sreelal.c@live.com	$2y$10$MfycE3o6lgrM92f5sB8kPu7c38XQkT6FeL5YF3pgx/M...	jobseeker	1
21	abc@gmail.com	$2y$10$ZWYhKrFT9B9m0CaysgRy5e1XMZ/e130v0LGkqw4QpkX...	jobseeker	1
22	jishnnuks@live.com	$2y$10$VKC/bSdNBZWJ6PrOwnJ6xezAj1aq5VioW9YjFUsjxnA...	jobseeker	1
23	info@microsoft.com	$2y$10$q.xafcSTYUoKtz2Flhrf7OX1x0weMZRzY3beiqoO2NG...	employer	1

Column	Type	Collation	Operator
adm_id	int(20)		=
adm_name	varchar(100)	latin1_swedish_ci	LIKE
adm_pass	varchar(100)	latin1_swedish_ci	LIKE

	#	Name	Type	Collation	Attributes
	1	apply_id	int(20)		
	2	user_id	int(20)		
	3	emp_id	int(20)		
	4	job_id	int(20)		
	5	status	int(20)		
	6	date_applied	varchar(20)	latin1_swedish_ci	

2) Job Posting

— *Employers should have the option of uploading their job openings in the system.*

— *When clicking the button of job-post they will be presented with a form.*

— *The form fields should be filled with information relevant to the job such as, description, position, salary, location, requirements, working hours, etc.*

— *After the field have been filled, they will be able to submit the form as a new job post.*

— *The job post information that was submitted will be registered in the database.*

— *Job-seekers will be able to view the job post on Job Portal's main page.*

jobid	eid	title	jobdesc	vacno	experience	basicpay	fnarea	location	industry	ugqual	pgqual	profile	postdate
2	1	Network Administrator	Consulting with clients to specify system requirem...	3	7	Rs75000	Network Administration	India,Karnataka,Bengaluru	Software Services	B.Tech/B.E.	M.Tech	Patience, Technical skills. IT skills, Interper...	09-04-16
3	1	Software Engineer	The focus of this position is the design and devel...	3	5	Rs 1000000	Network Virtualizing	India,Karnataka,Bengaluru	Software Services	B.Tech/B.E.	M.Tech	Strong ability in JavaScript. Strong ability in d...	15-04-16
4	2	Web Developer	Development of interactive websites at microfost	5	3	Rs 25000	Web Development	India,Kerala,Ernakulam	Software Services	B.Tech/B.E.	Not Pursuing Post Graduation	Knowledge in ASP.NET, SQL server	16-04-16

3) Sending Job Applications

— *After Job-seekers have selected their preferred job vacancy they should be presented at the end of every job post a button 'apply'.*

— *This button will submit their application to employers.*

— *Employer will be notified for this job application.*

— *The application will send the employer to the submitters profile.*

— *All actions will be registered in the system.*

4) *Creating Profiles as Employer or Job-seeker*

— *Both accounts should have the option of creating their own profiles.*

— *Both accounts will be presented with forms.*

— *Form of Employer will hold the fields of company name, company rating, location, and other information relevant to establishing the identity of the business.*

— *Form of Job-seeker will hold the fields of name, surname, age, email, phone numberand other relevant personal information.*

— *Job-seeker should have access to submitting together with their initial registrationprofile, their own personal CV.*

— *CV form will hold fields of the user's academic background, previous job experience, qualifications related to their field of expertise and other information related to their personal attributes.*

— *If this is not possible, the option of uploading their own file containing said CV should be presented to them.*

— *All the aforementioned information submitted by employers and job-seekers will beregistered in the database system.*

user_id	log_id	name	phone	location	experience	skills	basic_edu	master_edu	other_qual	dob	Resume	photo
7	14	Akshay V K	7894561231	India,West Bengal,Kalaikunda	5	construction , Tax	Not Pursuing Graduation	Not Pursuing Post Graduation	NULL	NULL	NULL	Akshay V K7.jpg
8	20	Sreelal C	8943202726	India,Kerala,Kozhikode	1	Experience in Php development , HTML , MYSQL, Ajax	B.Tech/B.E.	Not Pursuing Post Graduation	NULL	NULL	Sreelal C8.docx	Sreelal C8.JPG
9	21	abc	1234567890	Iceland,Austurland,Bakkafjor ur	1	sjndsnn,mnkjlnlnl jnn	B.A	CA	NULL	NULL	NULL	NULL
10	22	jishnu k s	9526919061	India,Kerala,Sulthan Bathery	9+	engineering at kmct	B.Tech/B.E.	MBA/PGDM	NULL	NULL	NULL	NULL

eid	log_id	ename	etype	industry	address	pincode	executive	phone	location	profile	logo
1	18	Infosys Pvt Ltd	Company	Software Services	Infosys, IT Zone, 4 - BE, Bangalore	458796	Ajith	9145512345	India,Karnataka,Bengaluru	Infosys is a global leader in consulting, technolo...	Infosys Pvt Ltd1.jpg
2	23	Microsoft	Company	Software Services	Microsoft, Bangalore, Karnataka	456987	Arun	78945612332	India,Karnataka,Bommasandra	NULL	NULL

2.2.3 Functional Requirements:

— The system should have a Sign-up and Log-in button.

— Sign-up should hold your credentials when you enter the page for the first time.

— Log-in takes your already registered credentials from the database and calls them toenter you in the site.

— The post job button should direct you to the form of filling in the information neededto be submit the new vacancy.

— Every job posted should be registered in the database.

— Every user, whether Employer or Job-seeker should create their own profiles andsubmit them so the information will be saved by the system.

— Job-seekers should be able to upload their CV in their profile.

— Their CV information should properly be stored in the database.

— Job-seekers should be able to apply for a job post they would find aimable to them.

— Every application should directly be sent to the Employer.

— Employers should be able to accept or decline the application send to them by the job-seeker.

2.2.4 Nonfunctional Requirements:

— Personal information of Employer should be protected by the system.

— Personal information of Job-seeker should be protected by the system.

— The website should possess friendly use features so every user can facilitate itsfunctionalities with ease.

— The system must provide 5 second or less response time in a Chrome desktop browser.

— The rendering of text and images must have a 5 second or less response time in a Chromedesktop browser.

— The system must be ablet to support 10.000 visits at the same time while still being abletto main its optimal performance.

— The website should be able to run on Windows 8 throughout Windows 11 without itsoptimal performance being affected.

— During an entire month, the website should perform without error for at least 90-95% ofthe time.

— The response time of the system after a failure occurs, shouldn't be greater than 15 minutes.

— The system should be available to users at all times, even during user influx.

- *Domain Requirements*

  Domain requirements are widely accepted features in a particular category, or a particular domain and are not user specific. Regarding our website, the domain requirements pertainingto the domain of a job posting and searching portal would be:

— The system should be created in such a way that all forms containing information fromboth Employer and Job-seeker should be recorder efficiently.

— All submissions should be recorded as an action in the system.

— Each update on the page should be registered by the system.

— The system should be able to access the tables of each job posts and profiles of bothaccounts.

— Applying for a job post by a job-seeker should successfully be send to the employer andregistered by the software.

— All data registered should be protected and secured.

— The software should be easily accessible for all the information it stores.

2.3 Model Development

In this project we will be using the Waterfall method. The reason behind it is that this method is very adequate for our application. The website we will create for this project will be quite predictable since its scale is small and we follow a sequence of predetermined steps throughout the whole model.

When we follow a clear structure of steps where each one has to be fully completed before movingforward to commit to another, creates a very manageable process. We understand the goals of ourteam and, the wants and requirements of our stakeholders clearly. Everything is well documented;we can clearly set out the projection of time needed and a schedule of deliverables from early on.If the team structure is to change, documentation allows for smooth integration of new team members.

This allows for the project to not be ultimately dependent on the knowledge of the original members but because the steps have been created harmoniously and consecutively, the system created is easily understandable and it would be easy to incorporate new elements if needed.

2.4 Requirement Validation

The process of ensuring that the specifications for development are accurate and defining the system the client desires is known as requirements validation. Requirement's validation enables us to identify mistakes at the beginning of the product development process, preventing them fromrequiring a great deal of additional work when discovered later in the system development life cycle.

A system, a work product, or a component thereof is validated to ensure that it satisfies the requirements of its stakeholders. Validation in requirements engineering is the process of ensuringthat the documented requirements align with the demands of their stakeholders, or whether the appropriate requirements have been specified. Requirement validation consists of requirement checking and requirement view.

2.4.1 Requirements Checking

We proofread the requirements papers as we checked the requirements to make sure no elicitationnotes were overlooked. We also examine the degree of traceability among all the requirements during these tests. This calls for the development of a traceability grid. This matrix makes sure that every requirement is adequately considered and that every specification is supported. During thesetests, we also look at the requirements' formatting. We check to see if the specifications are preciseand well-written.

Some important guidelines must be followed and met to determine whether the checking requirement is done properly.

1) **Validity**

   (Does the system provide the functions which best support the customer's needs?)

   A new software product is evaluated during validation testing to make sure that its functionality satisfies user requirements. Teams working on product development may conduct validation testing to find out how well the product is constructed and how it performs in various settings.

2) **Consistency**

   (Are there any requirements conflicts?)

   Simply put, consistency gives us the context we need to transfer our knowledge from one tool weuse to another in an understandable way for most of us. Each component should appear and function as though it were a portion of a larger organism. In this manner, we make using our finished product much simpler and more enjoyable for the user. To design user-friendly mobile applications and websites, consistency is essential.

3) **Completeness**

   (Are all functions required by the customer included?)

   Checking for completeness refers to making sure that all system functions necessary to meet stakeholder demands, along with their associated performance,

environmental, and other non- functional requirements, have been developed and documented.

4) **Realism**

(Can the requirements be implemented given the available budget and technology?)

A software engineer needs to know whether their requirements can be implemented given their funding and available technology. This is also a crucial component of software evaluation becauseit establishes whether the software can be applied given available funds or technological capabilities.

5) **Verifiability**

(Can the requirements be checked?)

Verifiability is a metric used to gauge how much work is put into confirming a piece of software's function and performance through tests, inspection, demonstration, and analysis. Testabilityrequirements define the procedure for ensuring that the designed and built product can satisfy therequirements through examinations, tests, demonstrations, and analysis. Comparison is used to complete verification tasks.

2.4.2 Requirements Reviews

Requirements Review is a process in the development procedure, with the aim to go through the system and ensure that the desired performance is reached. From the name "review" we can easily understand that we are interested in capturing irregularities, incorrect patterns, inconsistencies and turning them into accurate information. In this way errors may be detected atan early stage and avoid other problems that may arise while the requirements definition is beingformulated.

There are two parties involved in this process: the internal party (employees, managers, board ofdirectors) and external party (service providers, contractors, consultants). System developers andstakeholders continuously communicate with each other regarding the needs and wants that mustbe fulfilled to create value for

the user.

IMPORTANCE*: Because it establishes the framework for the entire development process, this stage is crucial to us as developers. If requirements are not thoroughly examined, it could cause major issues later during the software set up.*

There are some methods that can be used in the requirement review such as:

1) **Teamwork - Improved communication:**

Working as a team is essential because in a large pool of talents you can gain insights, recommendations, instructions, and supervision. The ideal approach is to get in touch with the group or person who has more knowledge about requirement review.

2) **Understanding the User's Requirement:**

It is crucial to fully comprehend the user's requirements since they are constantly evolving. Hence, we try to learn more about our intended user's demands so we can deliver the best product. Feedback is important to obtain precise information to understand the requirements.

Resolving Errors, by avoiding any misunderstandings:

Software issues are prone to recurrence. In the process of developing software, mistakes and flaws are inevitable. In this situation, engineers should identify solutions to meet the requirements and fully resolve the issues. The requirement review not only satisfies user expectations but also general industry standards.
Based on our research, we were able to identify these steps of the planning process that are highly adapted by consultants in this field. IN DETAIL, THESE WOULD BE WHAT IS PRIMARILY VALUED BY SOFTWARE COMPANIES.
Please see below:

a) Verifiability

Verifiability is the ability to demonstrate whether all the specifications for a software system are established as quality requirements. To know if we are producing the desired results in thebest way possible, it is crucial to evaluate the intermediate work products created during the software development lifecycle. We check to see if the output matches the inputs we are using.

In our situation, we may say that users of the program we developed will likely find all they require there.

b) Comprehensibility

We must make sure that the interchange of information and its understandability are achievedwhen developing a model. We should always use the simplest logic possible to support our models so that they seem like a set of linked stages that show how one idea is connected to another. Our application is designed such that not only the developer but also the client will find it pleasing to the eye and simple to use.

c) Traceability

In the development lifecycle, traceability refers to the ability to locate work items. It is used totrack the development of a lifecycle's progress and provide evidence of what has happened. Also, by linking two or more application development work items, traceability functions are used. The relationship shows how dependent things are on one another.

d) Adaptability

The project's development is critically dependent on the modification of the software system. This occurs because of the simultaneous shifts in consumer demands and the requirement to quickly adapt to new developments by sustaining existing systems. In order to attain efficiency,developers are always conducting research, watching the industry, and making notes about elements that need to be

updated.

2.5 Requirement Management

2.5.1 Requirements Change Management

Requirement, by name, is the process of locating, evaluating, monitoring, and approving modifications to the requirements known as "change management". This procedure's primary goalis to reduce the effect of change on the project's budget and timetable. It also aids in keeping the caliber of outputs.

For example, when the program run-time latency is requested in milliseconds rather than microseconds to make the run-time faster, one of the requirements they may need to modify will be adapted. That would be visible on our end in a broad software update.

Our logical approach to this would be as follows:

— We believe that software requirements must be adaptable enough to keep up with the ever-changing needs of business. To ensure that the software continues to fulfill the demands ofthe stakeholders, requirements change management enables updates to be made to the requirements in response to new business needs.

— Therefore, after noticing some problems on our website which have been noticed by our clients or our employees, we immediately started to do some research and find a solution on how to manage the required changes in the code, so that the website works.

— For example, when the customer registers on the website, he has problems saving data, it may happen that the website crashes and all his registered data is deleted. This forces us asthe creator of this website to make some changes in the code but maintaining the other functions and not costing us much as an action. To achieve this, we have planned on how to manage this whole situation.

IMPLEMENTATION – WHAT IS TO BE DONE:

— After we discover a problem that users have with our website, we immediately

start building a plan to solve it and to calculate the costs we need for this problem.

- The biggest go to as a Requirement Change Management is the customer FEEDBACK. Asservice providers, we will have a need to constantly ask for that.
- With requirements change management, it is possible to modify the requirements in response to user feedback. This input can be utilized to enhance the user experience and make sure that the program is simple to use and satisfies the demands of the users.
- Getting clients to trust us with their data is a further strategic objective. We go on to the next phases after establishing our desired outcomes. Key performance indicators come next. What will qualify as achievement? Customers who, at the conclusion of the service,may provide a review of the modification made or may evaluate it by evaluating our website, will help us understand the success of the website and the adjustments.

- After the plan has been created, all that remains is to follow the steps outlined within it to implement the required change. Change managers must concentrate on motivating their staff to take the required actions to carry out the initiative's objectives while also acknowledging any immediate successes. In addition, they should try to foresee potential obstacles and take steps to avoid, get rid of, or lessen them once they are found. For team members to remember why change is being pursued, the organization's goal must be reiterated throughout the implementation process.
- By tracking changes to the requirements and making sure they are properly reviewed and authorized, requirements change management helps to ensure compliance with these laws.

To sum up, requirements change management is a crucial step in the software development process. It enables requirements to be changed in reaction to shifting business demands and user feedback, while also managing project risks, keeping stakeholders happy, and ensuring regulatorycompliance. Software development teams can make sure that the software meets the needs of the stakeholders and users and is delivered on schedule and within budget by managing changes to the

requirements successfully.

2.5.2 Changing Requirements

We are aware of the additional add – Add-ons any software has when it comes to making it adaptable to the end user. As a development team, we intend to keep the end users up to date withall the input database, as well as the software's usage in the long run. One of the requirements they might need to change will be adapted whenever the latency of the program run-time is to be requested in milliseconds other than microseconds, so that the run-timeis faster. On our end, that would be displayed in an overall software change.

We are aware of the market demands and shifts in customer demand. As front-end developers, we might face the need to focus mainly on these steps: Improved collaboration with the stakeholder – here, the company willing to use their services to different companies to retreat employees.

- Usage of iteration in every step of the code conduction. As requirements are usually addedup from time to time, we want to focus on creating a slow flow of programming set up, sothat we can update the system any time there is a need to do so.
- We have assigned a project coordinator – Kejti Vakeflli, to keep up with the stakeholder requirements. As one, she will be updating the stakeholder's requests to our group of developers.
- Following the change of command, the changes will be interfaced and displayed in the overall database and assigned to the rest of the group.

Adapted on our code, this is a case – scenario, where changes in requirements will be applied:

Let's say we're developing our website for the client, who initially requested that it have a contact form that records the user's name, email address, and message. The contact form's codewas written by us, and it functions as intended.

When some time passes, though, the client realizes they also need to include the user's phone number and the subject line in the contact form. This modification to the specifications necessitates modifying the code.

To add fields for phone numbers and the subject line, we would need to change the code for the contact form. To support the new fields, this can entail upgrading the backend code and adding new HTML elements to the form.

Other areas of the code that interact with the contact form may also need to be updated, depending on how the form data is saved and handled.

The appearance of the website or how the user is presented with the form data may also changebecause of the modifications to the contact form. To keep the website operating correctly andmeeting the needs of the client, you might need to make more adjustments.

In conclusion, modifying the requirements during the development of software can have a substantial impact on the code and necessitate adjustments to numerous system components.

Troubleshooting on the Manage Applicants form:

Requirements gathering might involve asking questions such as:

- Should certain fields on the form be required?
- What should happen after submitting the form?
- Should the visitor be sent a message of confirmation?
- Should the form have CAPTCHA or other anti-spam protections?

After gathering requirements, we would start utilizing HTML to code the contact form. For instance, if the **Job Portal** client asked for obligatory fields, you would add the "required" tag to those fields in the HTML code to make sure that users cannot submit the form until all mandatoryentries are filled out.

— In these examples, the "email" and "phone" input fields are also required, as

indicated by the "required" attribute in the HTML code. This ensures that visitors cannot submit the form without providing their email address and phone number.

Changing requirements - include CAPTCHA or other spam-prevention measures, as an add – onour code, steps would be as follows:

1) Choose a spam-prevention or CAPTCHA service from a third party, like Google reCAPTCHA or captcha. You can utilize these services' APIs or libraries to include their technology into your form.
2) To add the service's technology to your form, adhere to the instructions specified in the documentation. This often entails using the service's API with a key or other authenticationdata and adding a script element to your HTML code.
3) Adjust your form's code to incorporate the service's given CAPTCHA or spam-preventionsafeguards. This could entail changing your form's submission code to submit the CAPTCHA response to the service for validation or adding a new field to hold the CAPTCHA response.

— Register for a reCAPTCHA API key at https://www.google.com/recaptcha/admin/create.

— Add the following script tag to your HTML code, replacing "YOUR_SITE_KEY" with your actual API key.

3. EXTERNAL INTERFACE REQUIREMENTS

3.1 User Interface

Our Job Seeker Portal will aim to increase productivity for both parties, the interested employee that is searching for a job position, as well as the employer that is the need of a new employee. The users of our website will have the possibility to create a personal account, access a job opportunity, receive information, and other assistance in choosing which positions to apply for. User interface facilitates all the interactions and operations that will happen between the user and the hardware or software. They also remove complexity by using various designs that play a critical role in the visualization.

The first element that appears when the user accesses the software is the search bar, where he can try to add a keyword related to any job, he might be interested in. Below will be shown three options where the user will decide either he will be the employee or the employer. Both of options will charge nothing to the user. On the other hand, there is a remained option considered as a premium package that will offer another kind of experience with more additional support by the administrator, hence this will charge a fee for the user.

In the end of the first page, there will exist a form that the user can fill in in order to get some feedback related to their inquiries about the process. Moreover, a google map is going to give the location of the job posted on the website. If the user will click on the Job Seeker option, users will be asked to enter all the required credentials such as email, password, name, location, birth date, skills as well as education.

3.1.1 Usability

- User-friendly
- It is efficient to use from the user side.
- The user is able to update data while using and edit the previous data or delete.

- The user can get information in real time using this platform.

3.1.2 Accessibility

- The software is a web application, so it is accessible whenever the user has a internet connection via WIFI or mobile network.

3.1.3 Responsiveness

- One of our aims is to make our application responsive in the visible part, in the design but also in the way it generates data and information.

3.1.4 Flexibility

- Since the users have no IT knowledge or at least most of them, the application should be easy to be accessed and used. The employees and the administrator can update data all the time, while the users can check businesses and contact with them in a short time and with a small number of steps.

- The application it is predicted to manage and correct the errors in a short time, in this way it cannot cause any problems in use.

3.1.5 Efficiency

- The web application should be efficient, so it can solve the technical issues the businesses and users are facing, making most of their procedures easier and shorter in time.

- The application itself should be easy to use from the users, every button and option is understandable and also the error messages can help.

3.2 Hardware Interface

The hardware interface is responsible for using devices and the component relationships work in that way that they may create an interaction with the user in order to offer the service. ‘Job Portal’ is a web-based application. One of the main

factors to affect the performance of it, is the internet connection. It is also important the hardware performance of the device you are using and of course the process of obtaining data from the database. The better the internet connection the faster the service provided. If your device has large speed internet even multiple users from the same internet provider can be supported. Also, the specifics of the device are important like the CPU. It is better if your device offers a bigger memory space. Somehow the bigger storage can provide service to multiple users. But we will make sure that even if the internet connection is not the fastest, still the service is provided so a number of different devices and internet connection are taken into consideration while building the web application.

We have three different types of users, the admin of the 'Find You', the businesses and users. The information the page will held is static too, the menu offers only four elements, the database of the businesses, the database of the users, the page with the information mainly descriptive for advertising of businesses and another page where all planners are going to be shown. Our application is web based and can be accessed via internet. The accessing of the user, log in is done in under 10 seconds. All data except the way pages will be previewed according to the static requirements above is dynamic. The databases itself are dynamic, they can be edited, businesses or users can be added or deleted to.

— The keyword searched is done in under than 2 seconds.

— The registration is done in under than 5 seconds, excluding the information filled in.

— The log in is done in under than 5 second, excluding the information filled in.

— Expected throughput: One user can request one service at a time, the system can only handle 50 requests at a second.

Moreover, the application is available 24 hours a day, 7 days a week, accessible anytime. Regarding the geographical area of users, it will not be an issue, since the platform may be used from anywhere, by only having internet connection to operate in the system. This software builds up in a web application will be both efficient and effective on its use, helping both the businesses and customers to access data and reduce the mostly the time it takes to search through social media for businesses that offer a specific service.

- Floor Space: Everyone can access this website from their homes.
- Power Supply: Power they can get from their homes.
- Internet Connection: Customers and businesses can access the website using internet.

3.3 **Software Interface**

Software interfaces are the languages used to communicate with each other and to the hardware. Several technologies will be used in the client-side web development including everything that the user is going to see on their screen, as well as the server-side programming that will be a back-end code that will include all the logical associations within our code.

a. Client-Side Programming (Front-end)

— JavaScript- to make pages more interactive.

— Bootstrap-CSS framework and JavaScript templates for forms, buttons, navigation or another interface.

b. Server-Side Programming (Back-end)

— Programming Language: PHP.

— To store the data: MySQL database.

3.3.1 Frontend

There were several technologies used to build the frontend. HTML was incorporated in order to create a solid structure for the software. CSS was added to that structure to generate a visually pleasant content. In order to have more progressive design with extensive functionalities with respect to the frontend, JavaScript programming language was used. After an initial design of the software, more expectations needed to be met. That is why we incorporated Bootstrap, a CSS library, which presented a more innovative perspective for the software design. JQuery, a JavaScript library, came in handy when we needed to extend the software functionalities with respect to the frontend.

3.3.2 Backend

With respect to the backend, we tried to keep the things simple, and that is why we chose to build the backend only by using simple PHP programming language. Since PHP as a scripting language is well-known for its vulnerabilities with respect to the security component, we made sure to provide the maximum security for the web-app, in order to prevent all sorts of malware attacks.

3.3.3 Database

Following the logic of “To do it right, do it simple”, we chose to incorporate the MySQL database in building this software. Being more familiar to this database management system, while considering it straightforward and not so demanding, making it handy definitely made our lives easier. We did not need to put much effort in providing a secure environment while using this relational database, since MySQL database is well known for the data security it provides.

4. SOFTWARE DESIGN

4.1 User Scenarios:

A user scenario is the fictitious story of a user accomplishing an action or goal via a product. It focuses on a user's motivations and documents the process by which the user might use a design.

Client Scenarios:

1. *Client Register and Login*
   a. Client The client accessesthesystem.
   b. The platform asks for a username, password, and relevant data.
   c. The client enters the data.
   d. If the data is correct, the client is registered successfully and if the data are incorrect, an error message pops up.

2. *Settings*
   a. The client logs into her account.
   b. After she clicks push the settings button in the menu, she inserts the data that shewishes to update and/or the new password on a readymade form.
   c. The system will ask for the password (the old one if she is changing it).
   d. After entering the password, she saves the changes, and the page reloads so that shecan see the newly updated data that she inserted previously.

3. *Client Appointment Booking:*
   a. The client logs in with her personal account.
   b. In her personal account, there is a calendar where she can see which day and hour isfree so that she can book an appointment.
   c. The client finds the date on which she will leave the appointment and selects it on thecalendar.
   d. An appointment data form will be displayed, which she completes with the time andservices she wants to receive and then simply sends it.

e. In the end, her appointment status will be pending.

4. *Client Approval / Disapproval of Appointment*
   a. If the appointment is approved, the client will receive a successfully booked message.
   b. If the appointment is not approved, the client will receive a disapproval message.
   c. In the second case, either the appointment is completely canceled due to overbooking, or by clicking the message, the client can reschedule the appointment at a time specified in the message.

5. *Client Discount Points*
   a. After every service and purchase, the client will receive bonus points.
   b. Those points will be sent and displayed on her account by the system where she canuse or redeem them later.
   c. With those points, she will receive discounts or other benefits.

6. *Client Appointment Stored*
   a. The client can find her stored appointments in her account.
   b. She should enter the previous appointments displayed on the menu and there can find all the stored previous appointments that she has already completed.

7. *Client Gallery*
   a. After logging in her account, the client will see a good size screen that is dedicatedto photos and pictures, maybe even short videos.
   b. The client can find there her own photos or photos of the salon.
   c. Photos will be directly appearing in the dashboard as a slideshow gallery; therefore, shewill not need to do anything to see the photos.

8. *Client Logout*
   a. Presses Logout on the top left side of the page to lock out of her account.
   b. For their security, the password is not saved.

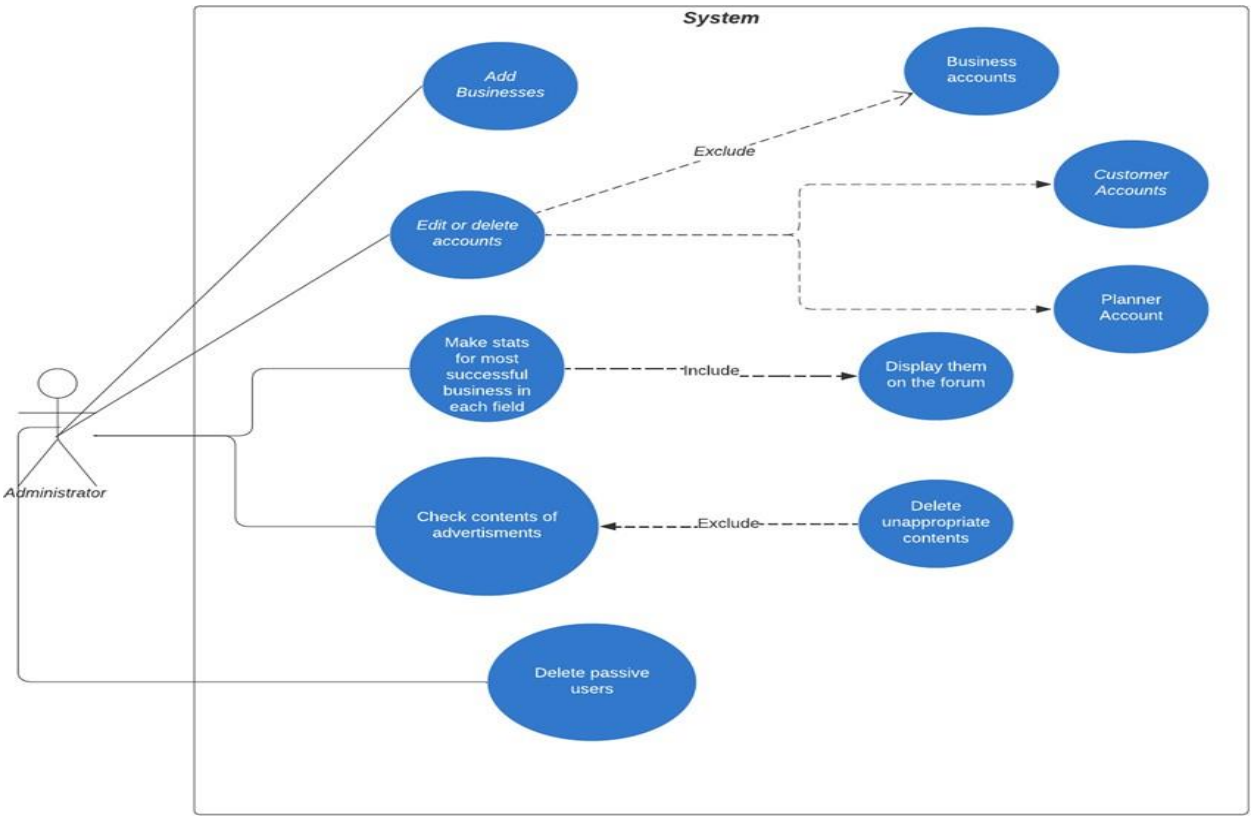
4.2 Use Cases

Admin Use Case

User Scenarios

A user scenario is the fictitious story of a user accomplishing an action or goal via a product. It focuses on a user's motivations and documents the process by which the user might use a design.

1. Case 1:



2. Customer Use Case

1. *Admin Login*

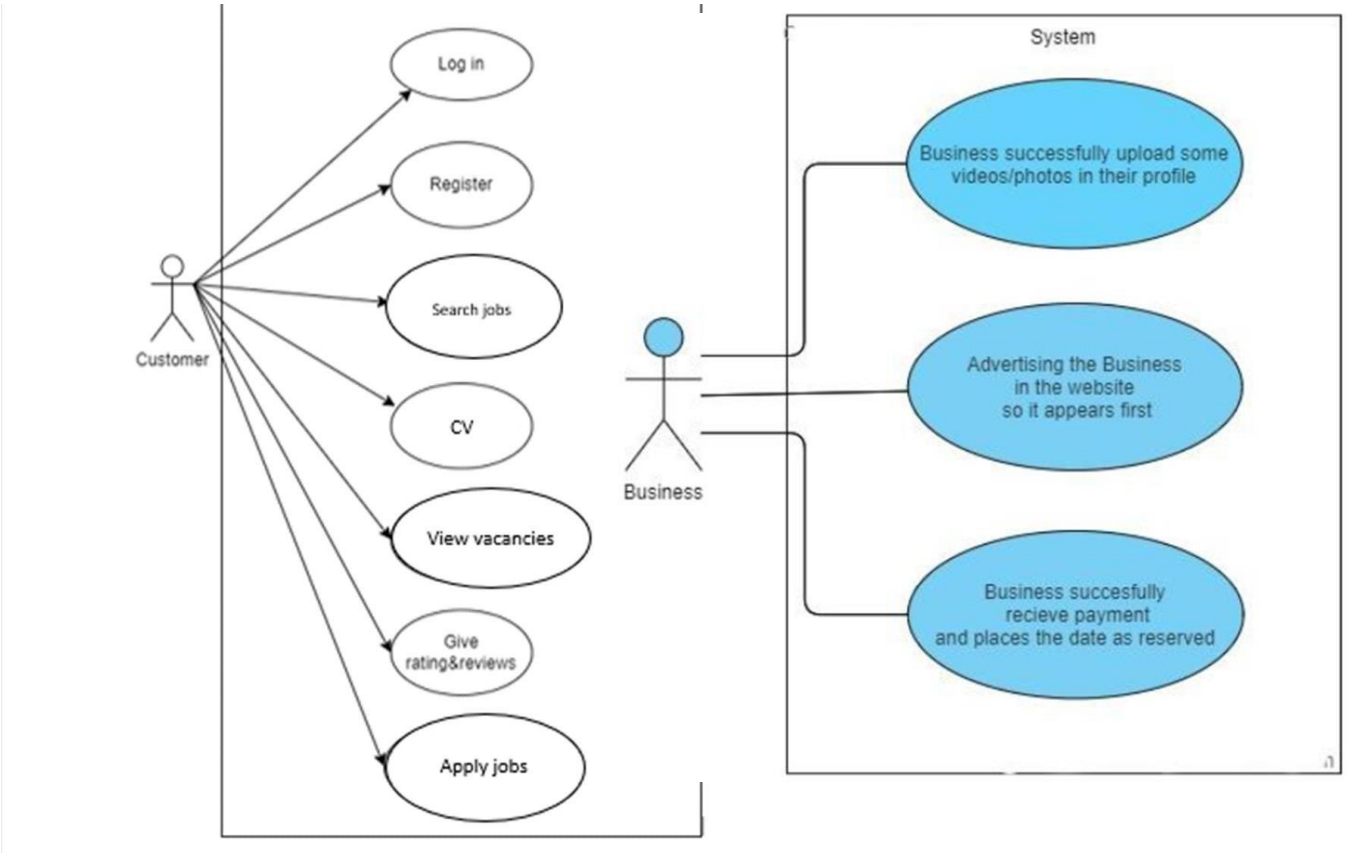
a. Admin enters his/her credentials.

b. If credentials proven correct, admin is redirected to the Admin Dashboard.

c. Otherwise, an error message pops up and the administrator is asked to re-enter accurately his/her credentials.

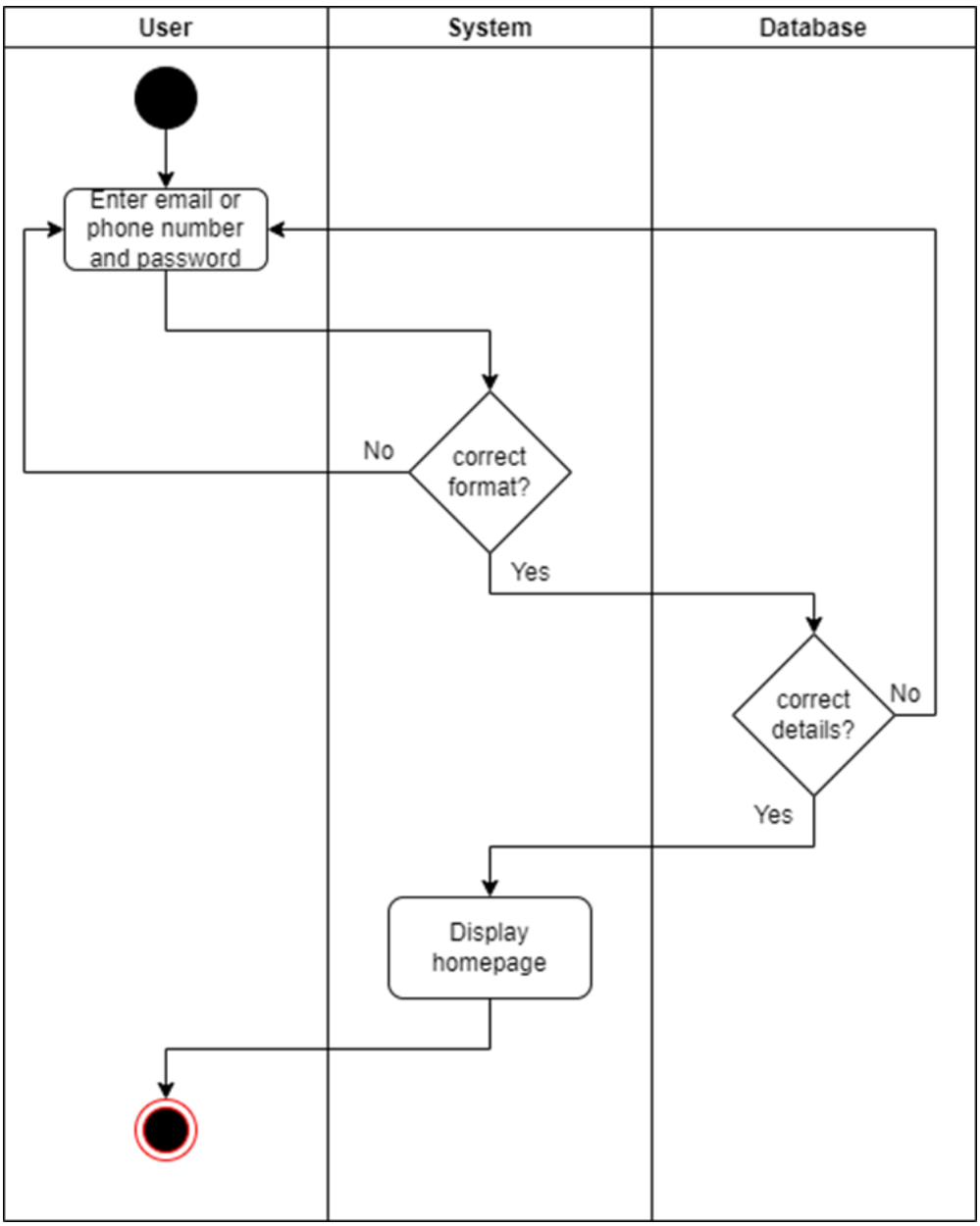
d. Once logged in, the Admin Dashboard including a dropdown menu, business statistics, the appointments calendar for the current day, quick reports generation, information regarding employees having their birthday, and a sign out button, reveals itself. This would be the home section of the menu.

e. Admin can generate PDF files of the reports listed under the Quick Reports

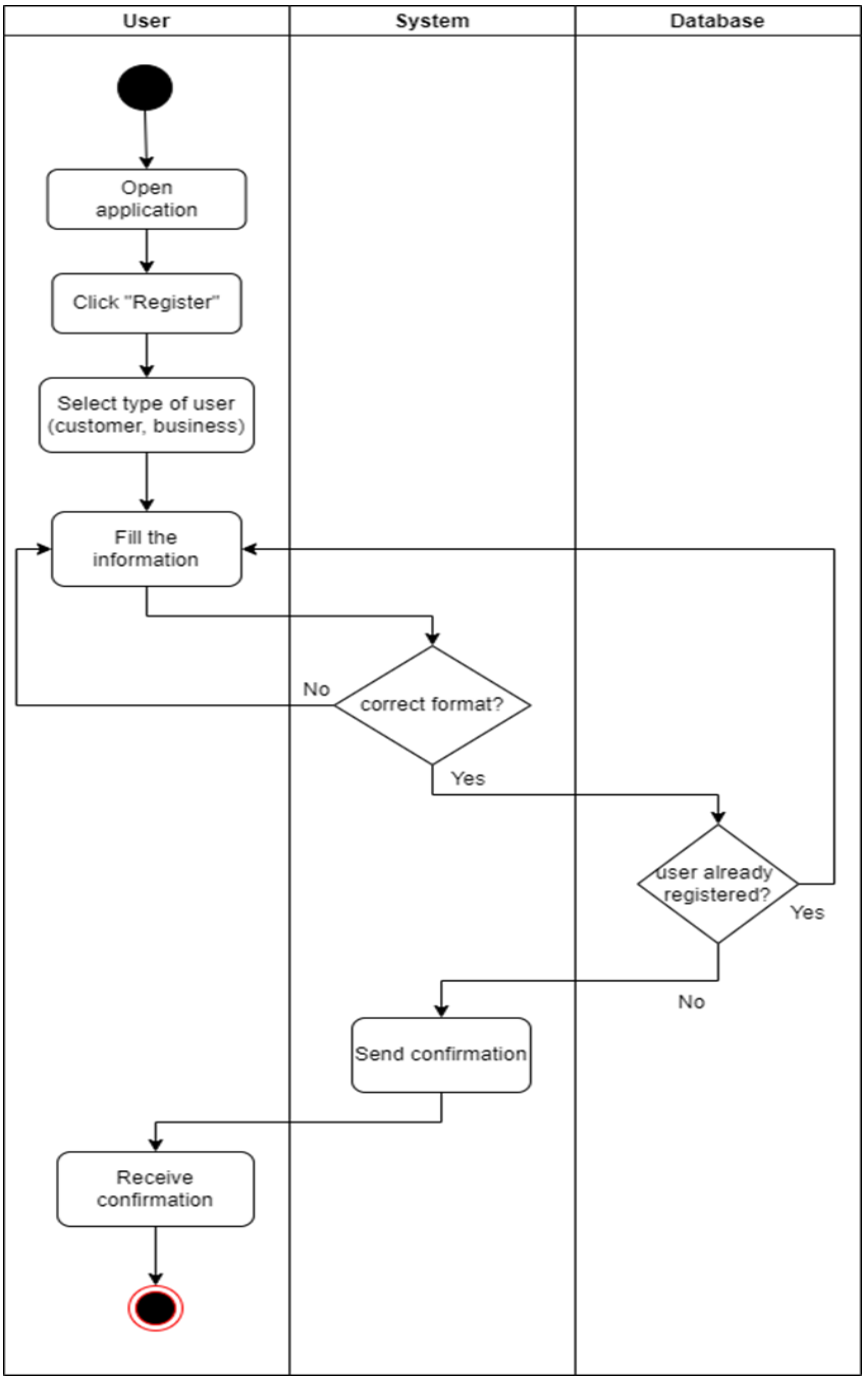


4.3 Activity Diagrams

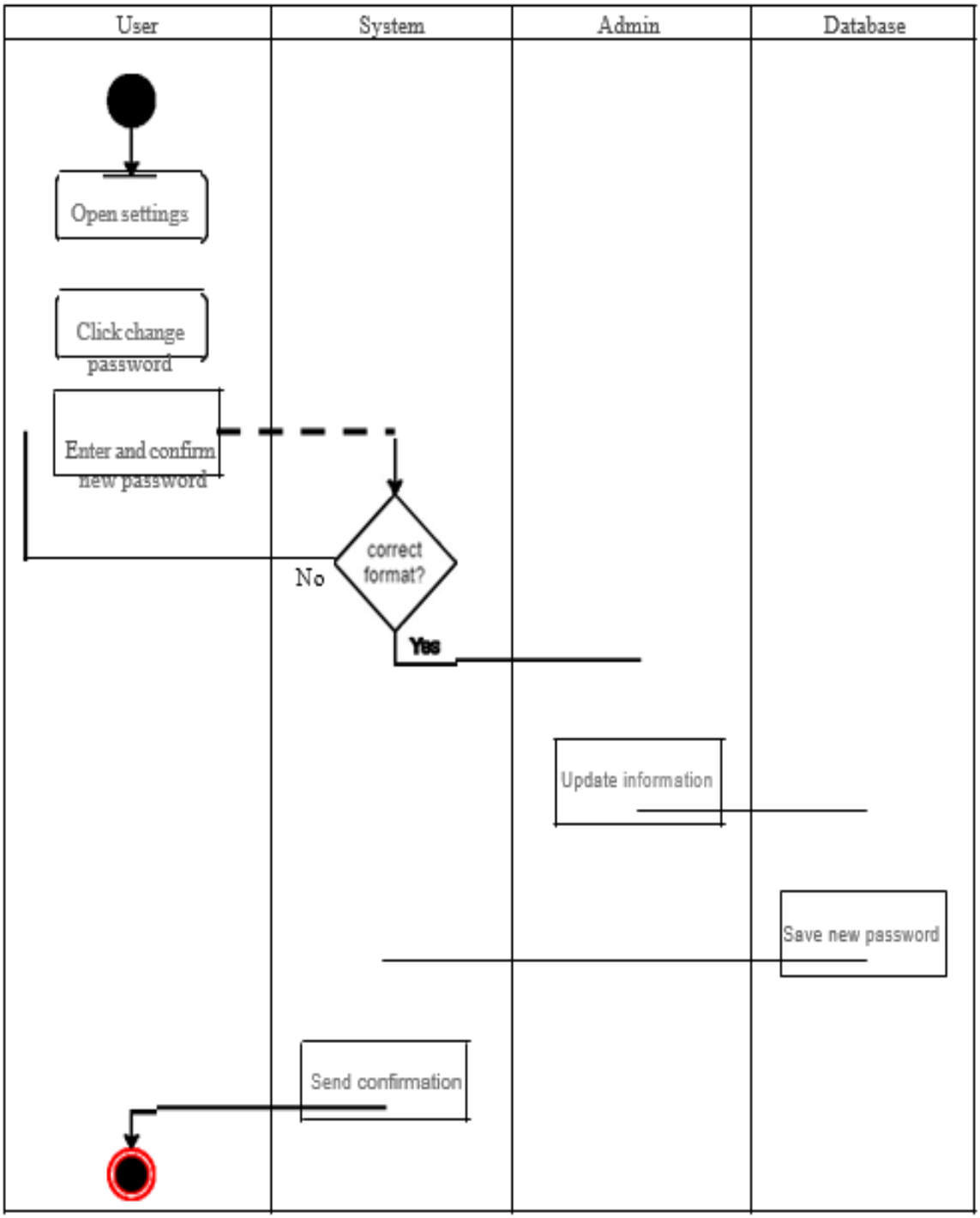
1. Login



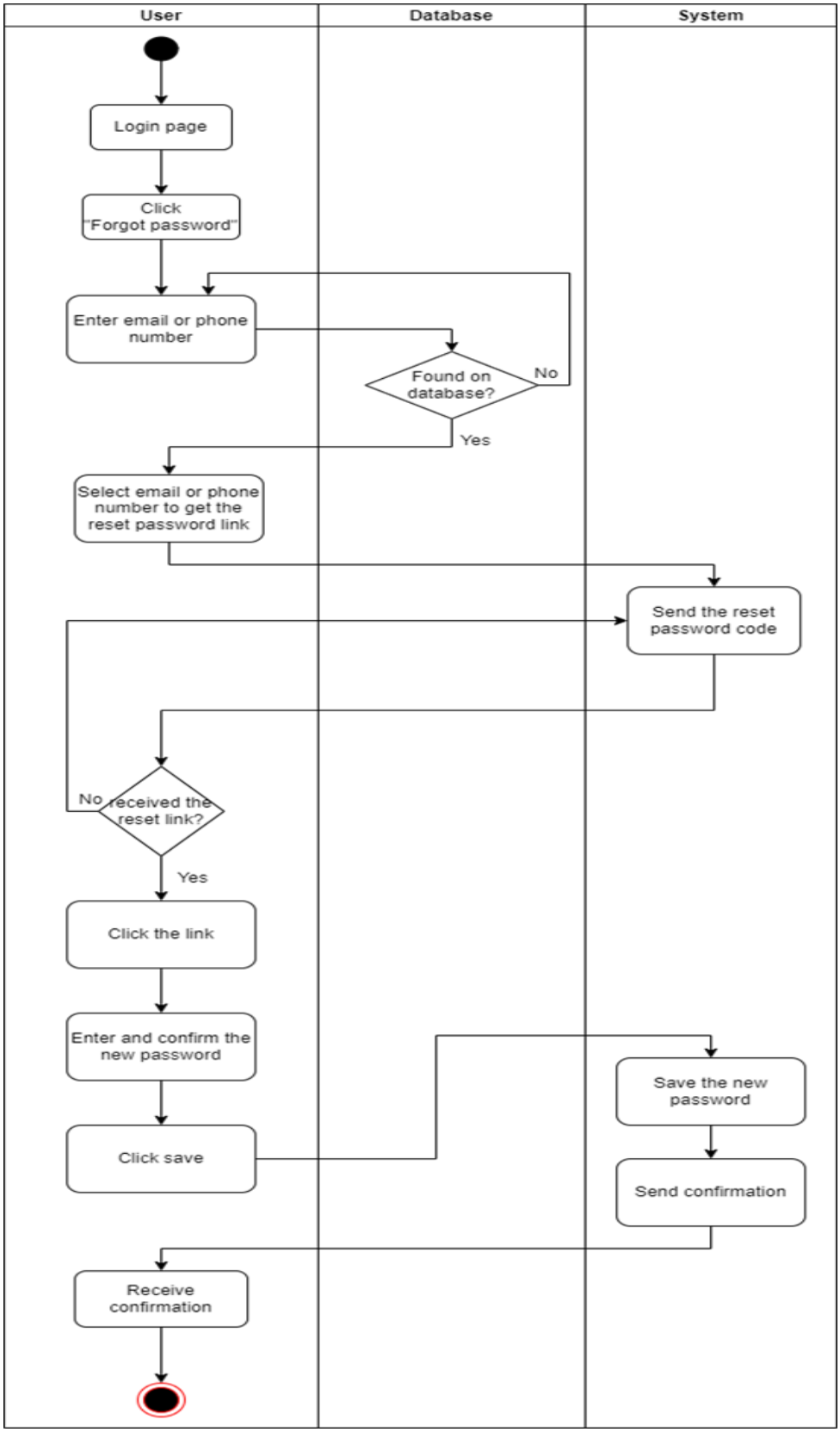
2. User registration



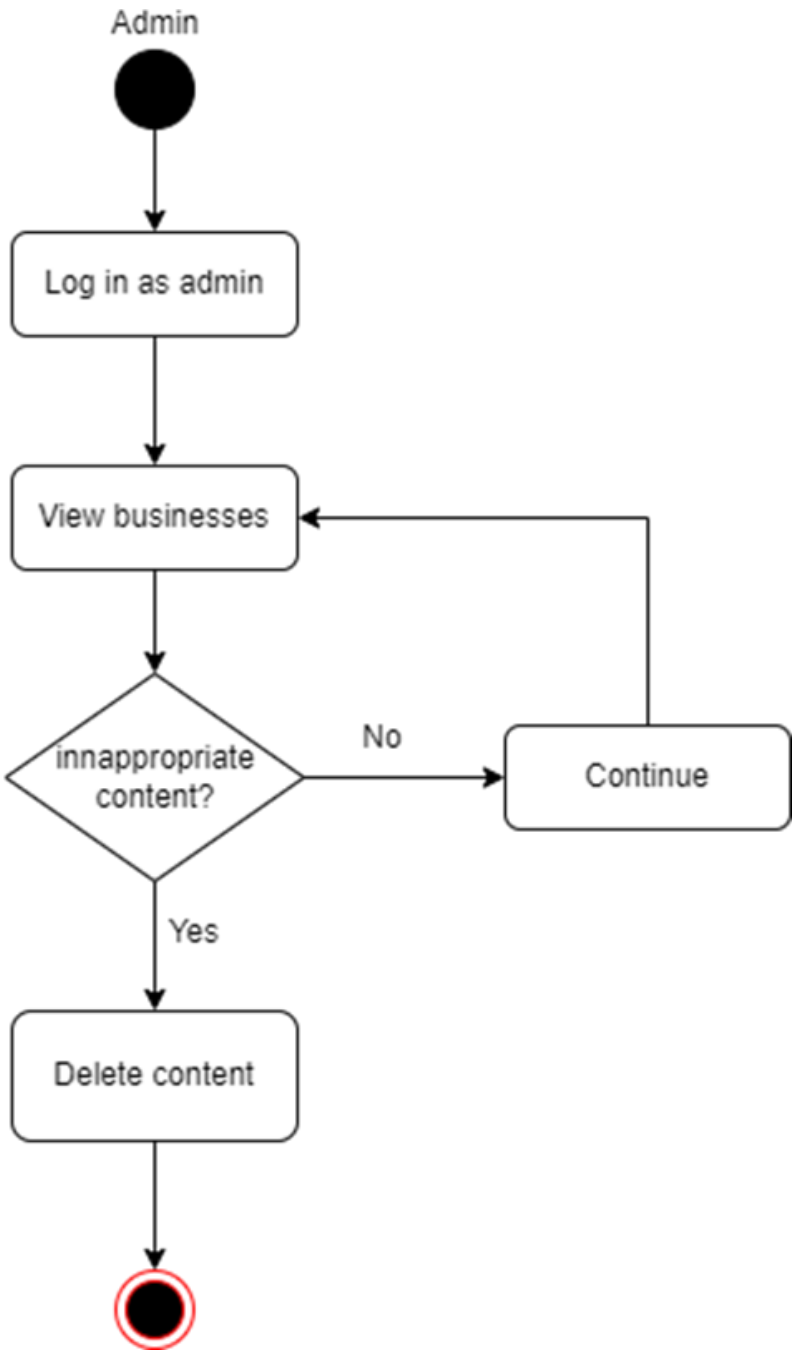
3. Change password



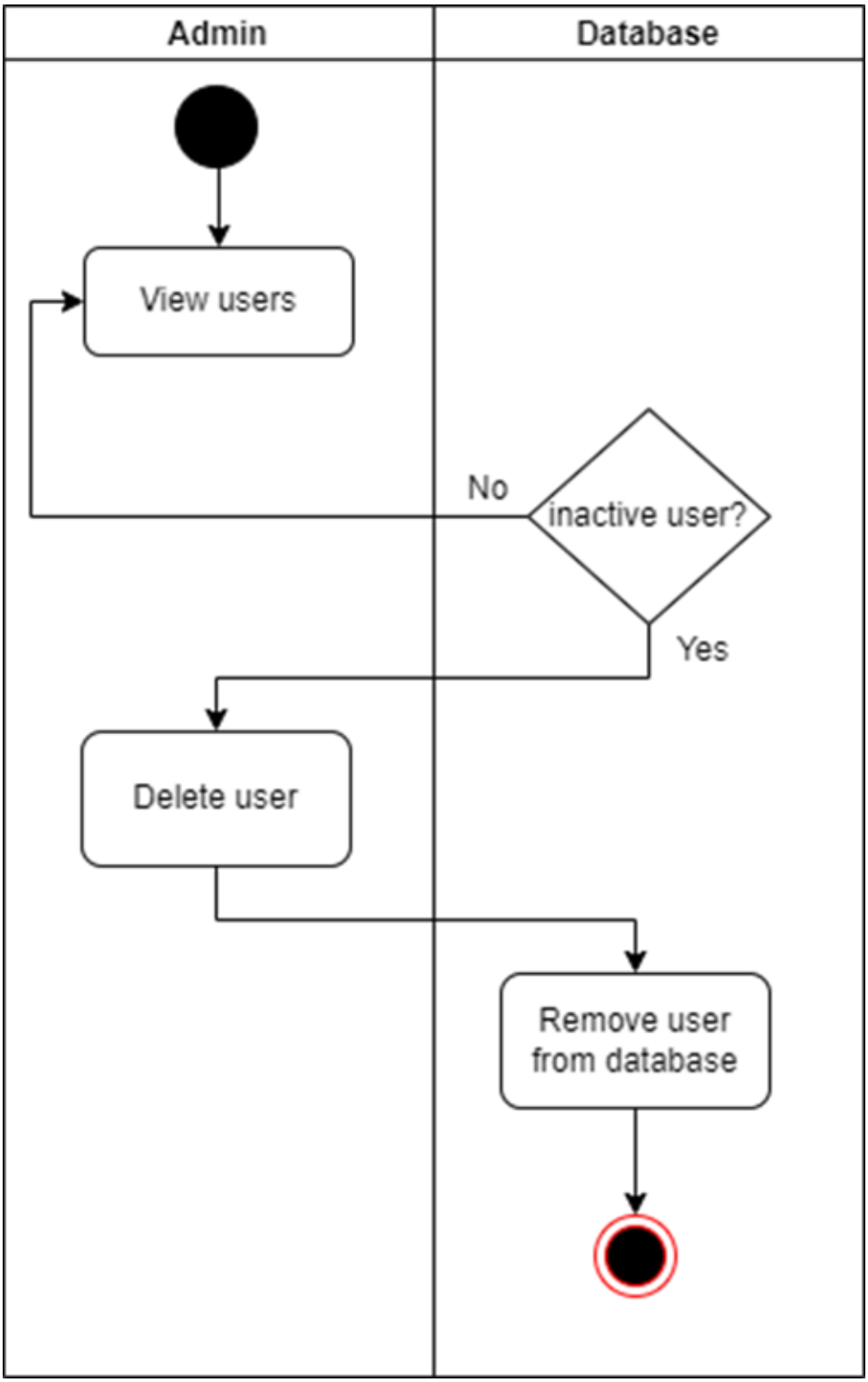
1. Forgot password



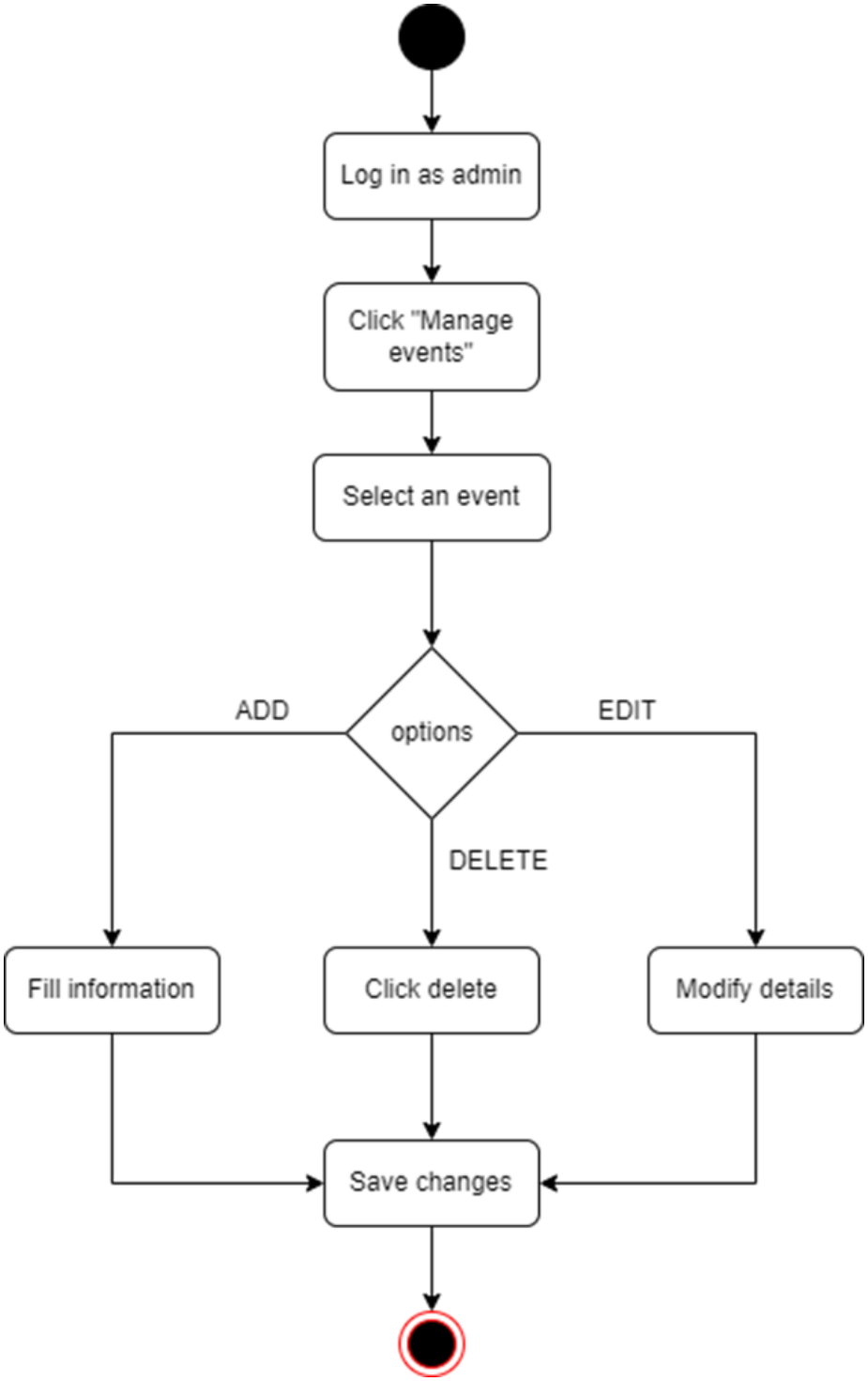
2. Check contents



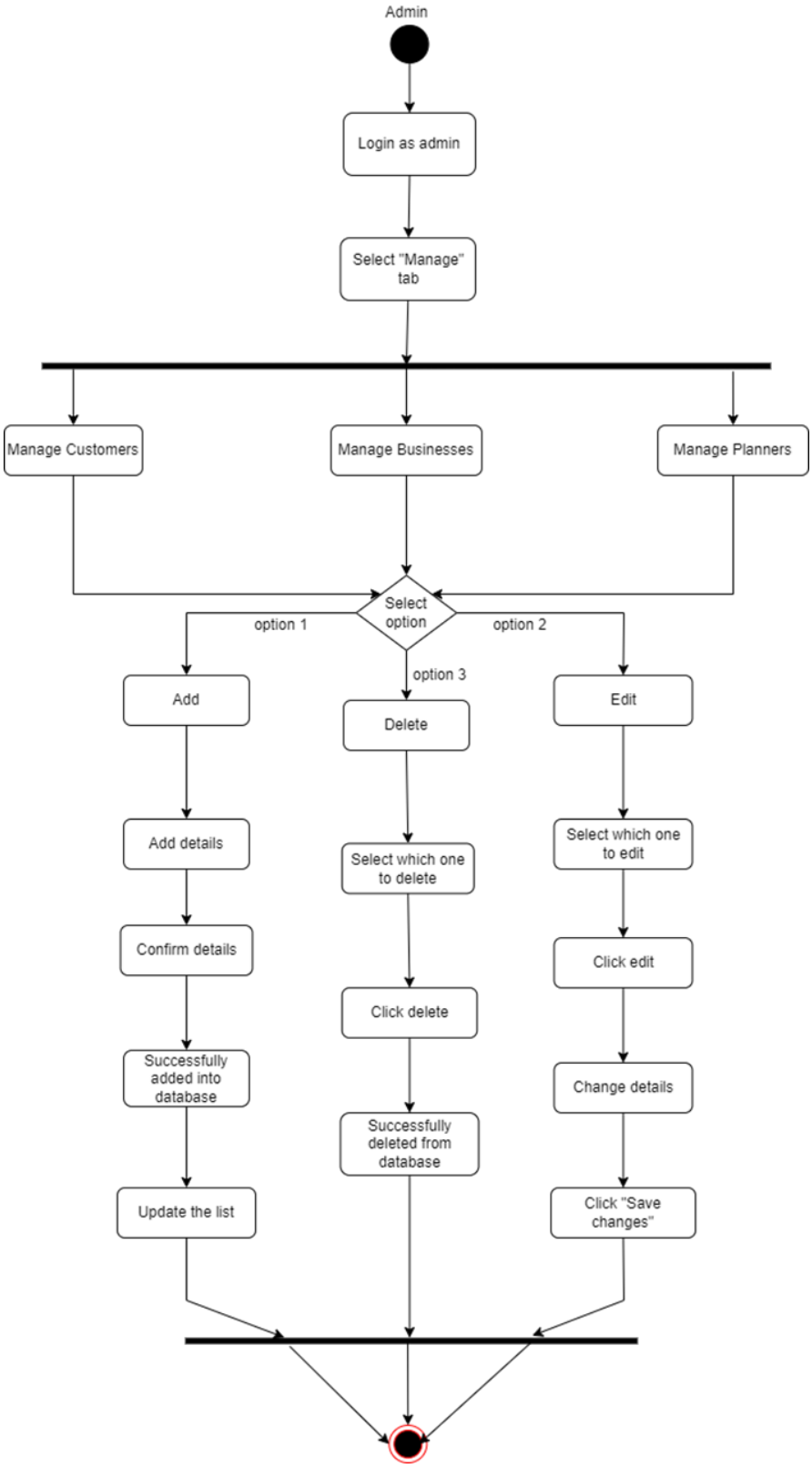
1. ***Delete inactive users***



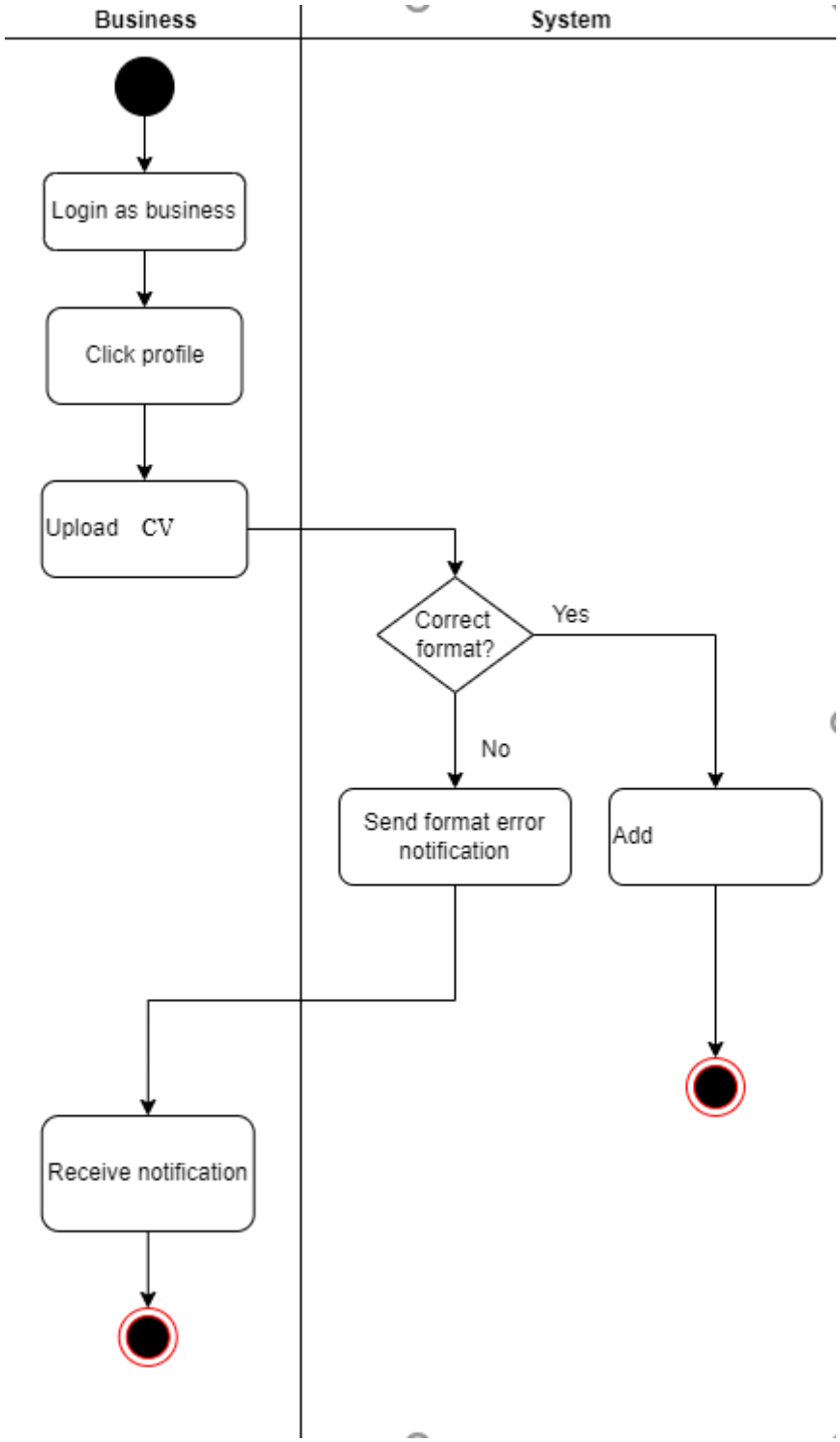
2. Manage events



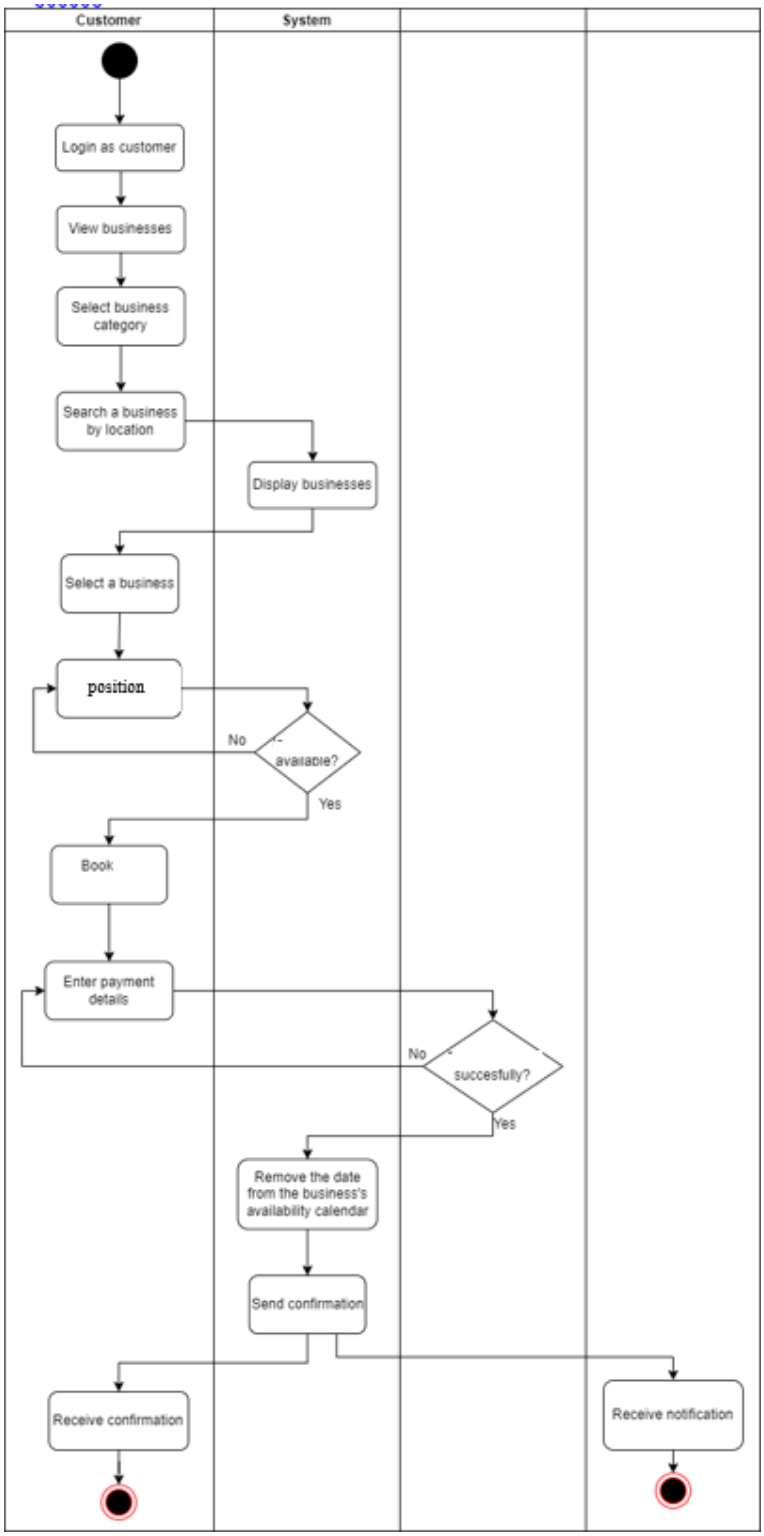
3. Management



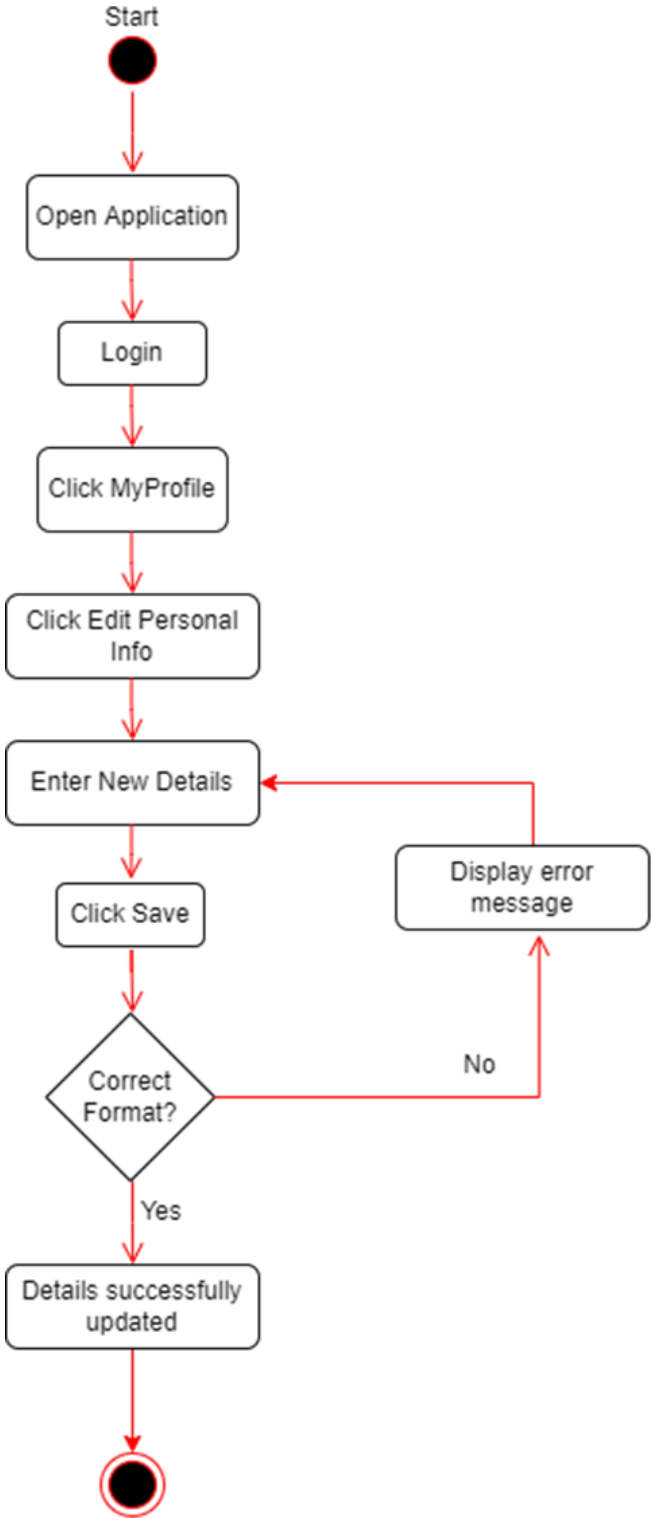
9 Upload CV


Business
System
Login as business
Click profile
Upload CV
Correct format?
Yes
No
Send format error notification
Add
Receive notification

10 Job Advertisement



11. Edit info


Start
Open Application
Login
Click MyProfile
Click Edit Personal Info
Enter New Details
Click Save
Correct Format?
No
Display error message
Yes
Details successfully updated

4.4 Customer Scenarios

1. Customer Login

a. Enters email and password.
b. If the email and password are correct and match the database, they are redirected to the customer home page.

2. Customer Login fails

a. Enters email and password.
b. If they do not match in database than error notification displays letting you know something is incorrect.

3. Customer Information

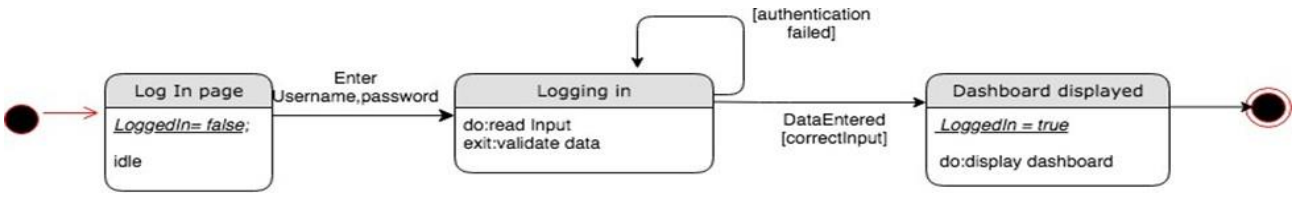
a. User logs in their Employee Dashboard.
b. Displayed will be all their information in a nice aesthetic design.
c. Salary and Vacation Days will be displayed in two information boxes.

4. Customer Settings

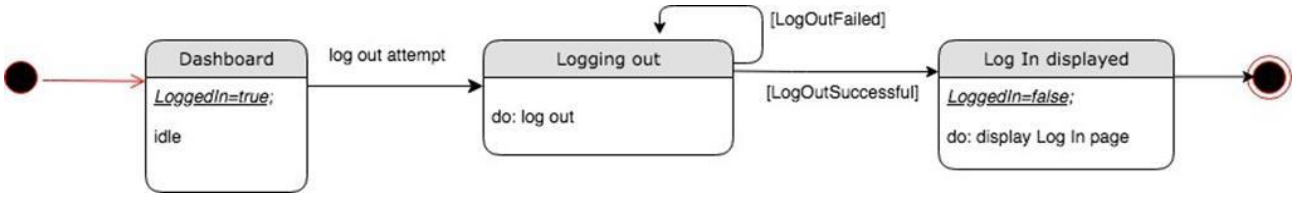
a. Employee has the right to change their password and personal info.
b. By going on to the settings, the page directs them to where they can change their info if they wish so.
c. Enters the new password and/or personal info.
d. For security issues, they are required to reenter their (old) password if they want to save the changes to their information.
e. The restriction is that they cannot change their salary.

Final Project CEN302 - Software Engineering

ST_01 Login

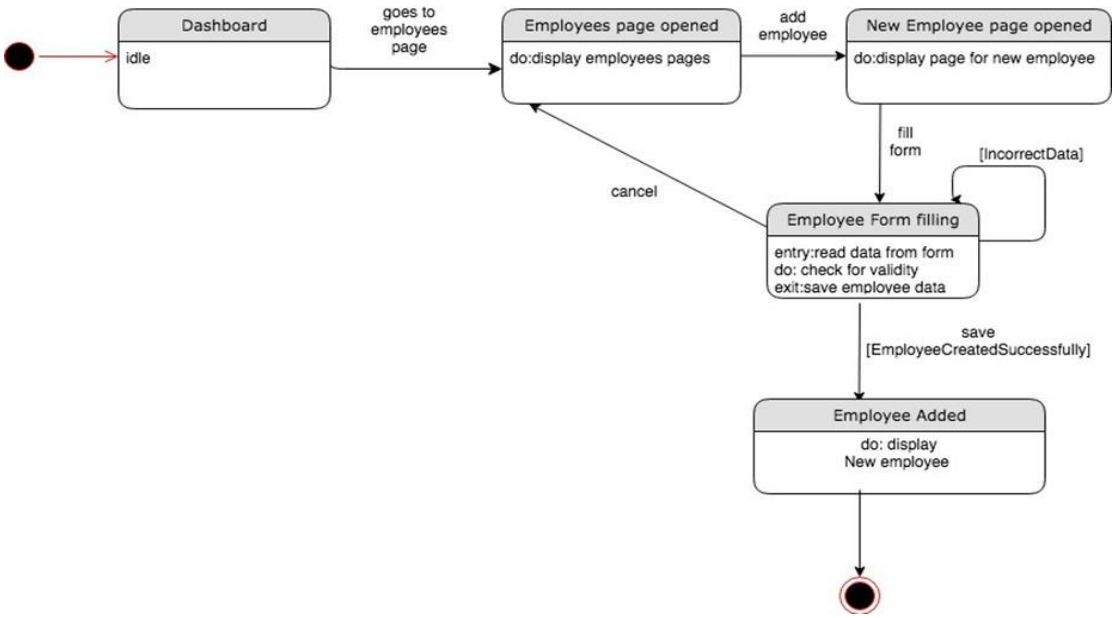


ST_03 Log Out

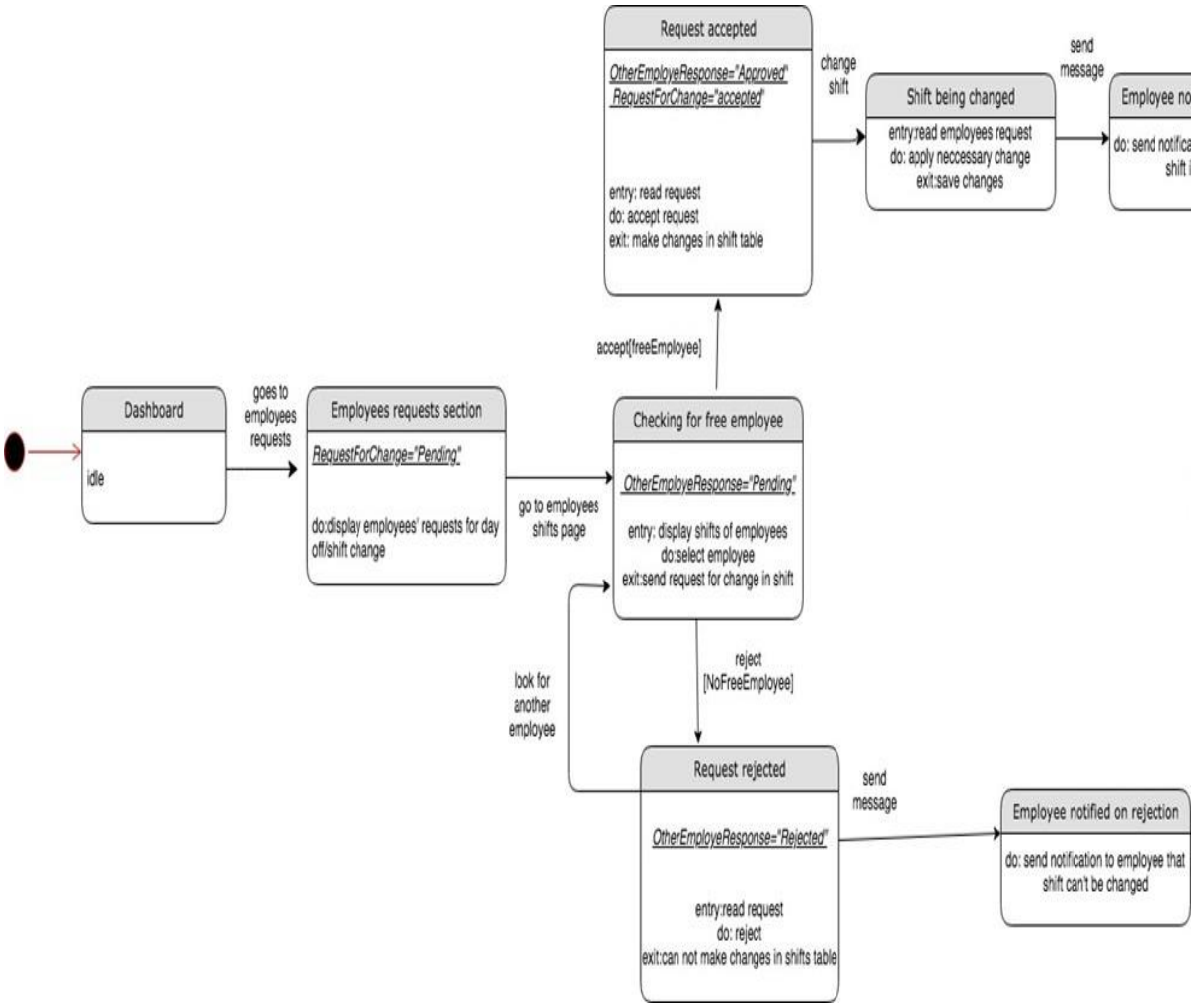


ST_10 Register as an Employee

Final Project CEN302 - Software Engineering

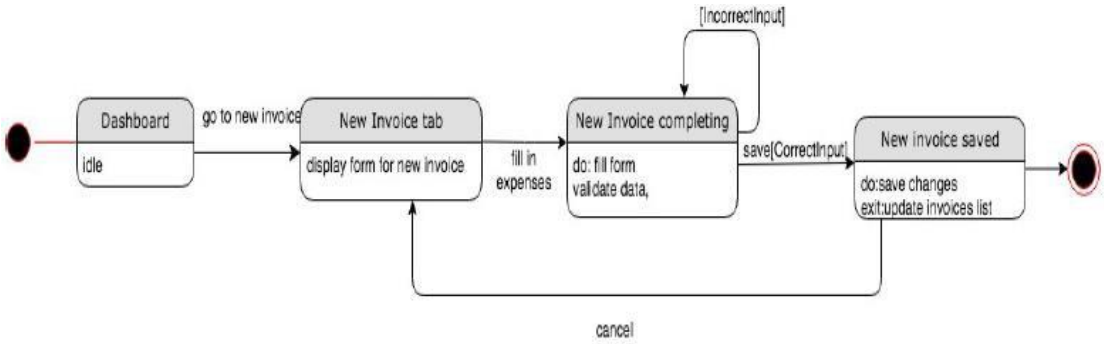


ST_15_16 Accept, Reject Employee Request for job

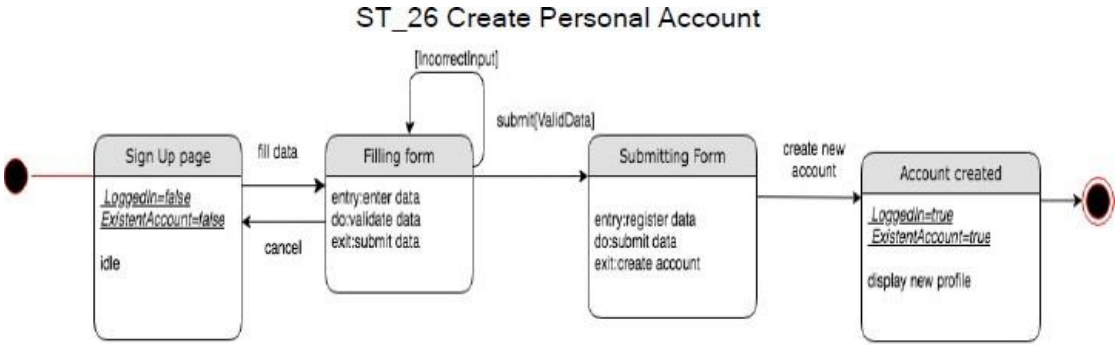


1 - Input Applicant's CV:

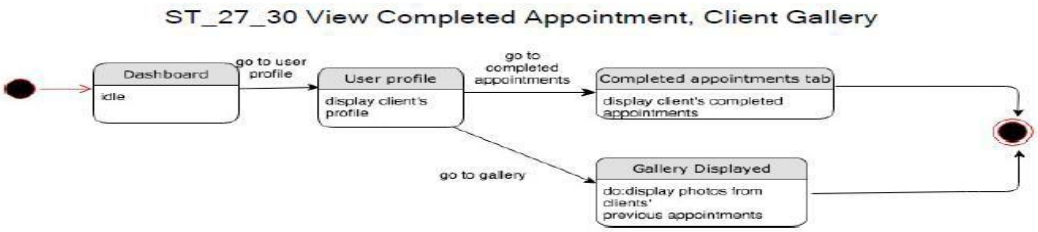
To us, every client is a new invoice derived – which means invoices billed to people using the software, are linked to them, whenever they create the account. The logic follows as seen below:



2- Create personal account: We made this diagram, to show how the logic decision making is applied whenever we created this software.

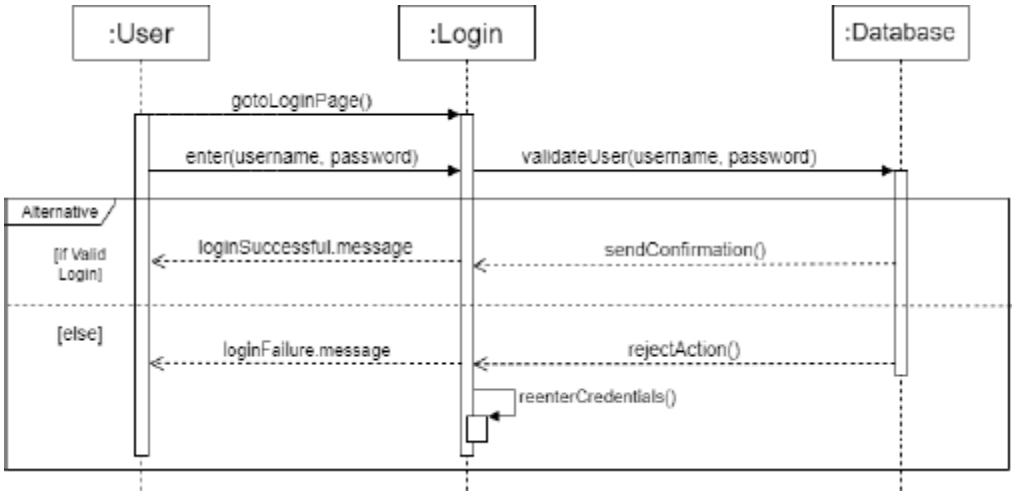


3 – View completed CV and client's CV profile:

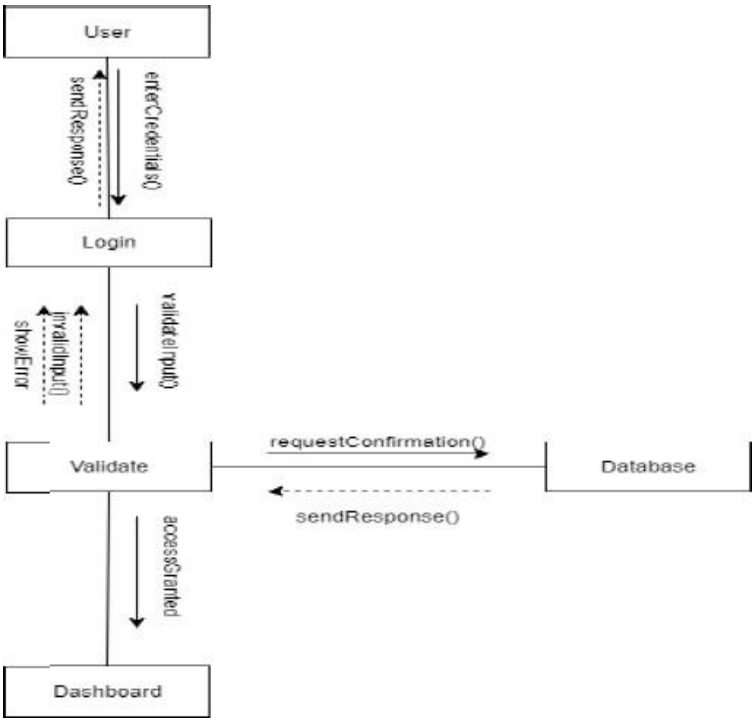


4 – Sequence and collaboration Diagrams:

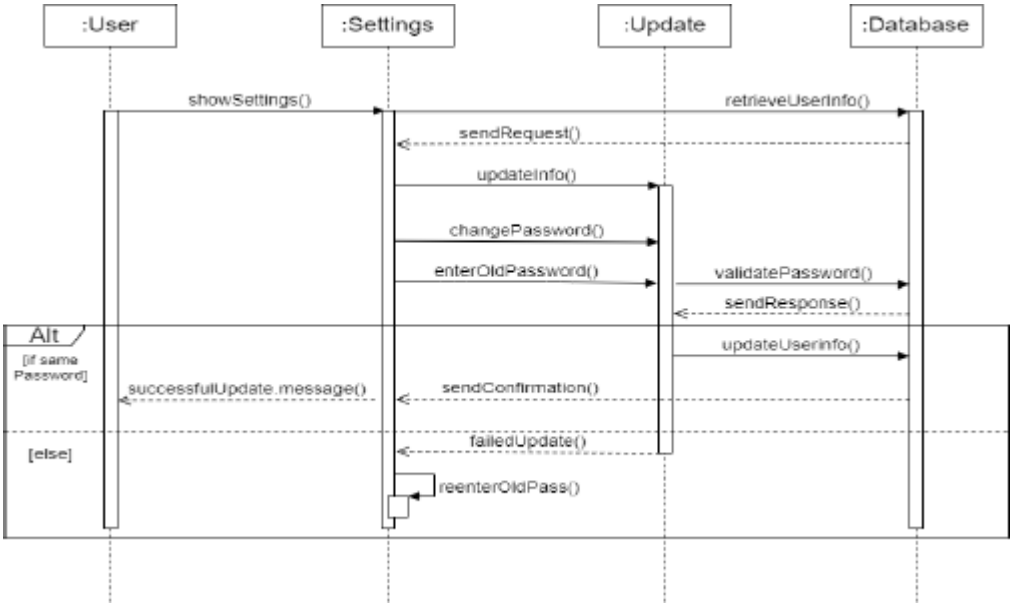
A: Log in: This is the first step to creating a User log in on F application. Please see below:



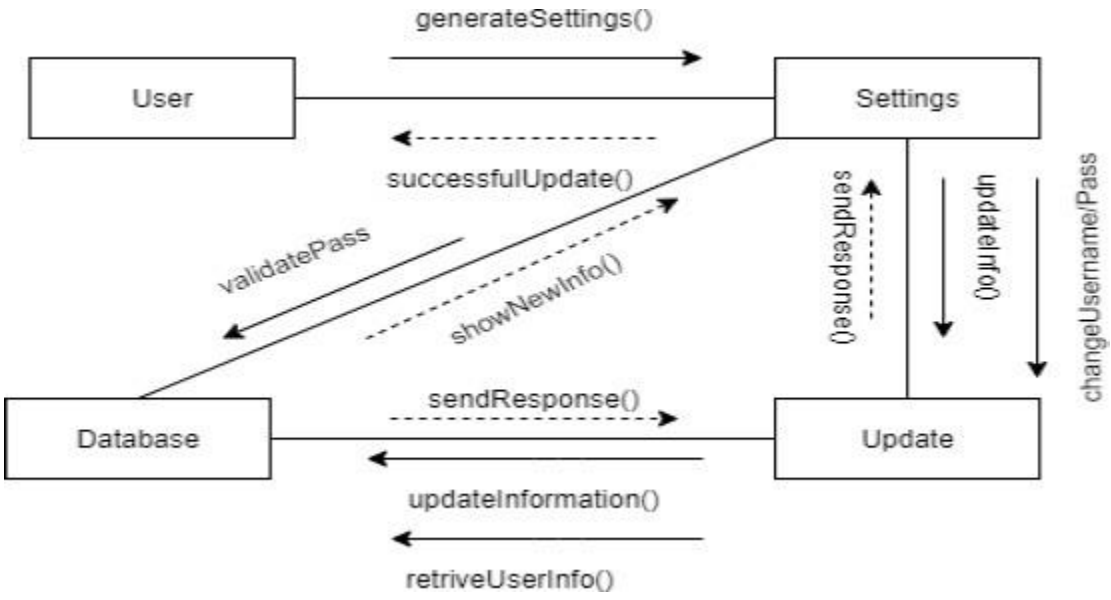
B: USER LOG IN: Every user will have their own log in, followed by the Decision dashboard – linked access granting. Access will not be granted, unless we can upload the log in name, email, client's personal and professional information.



C: UPDATE SETTINGS:

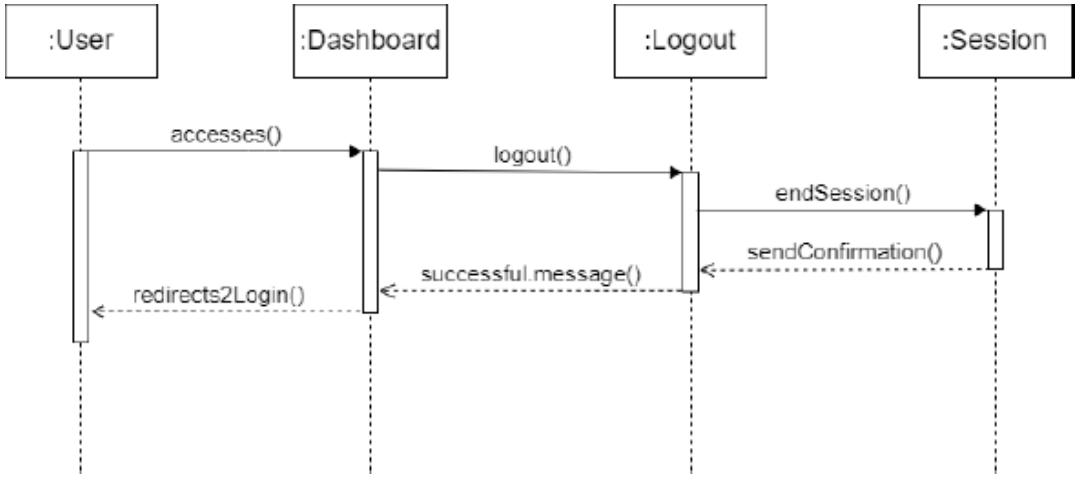


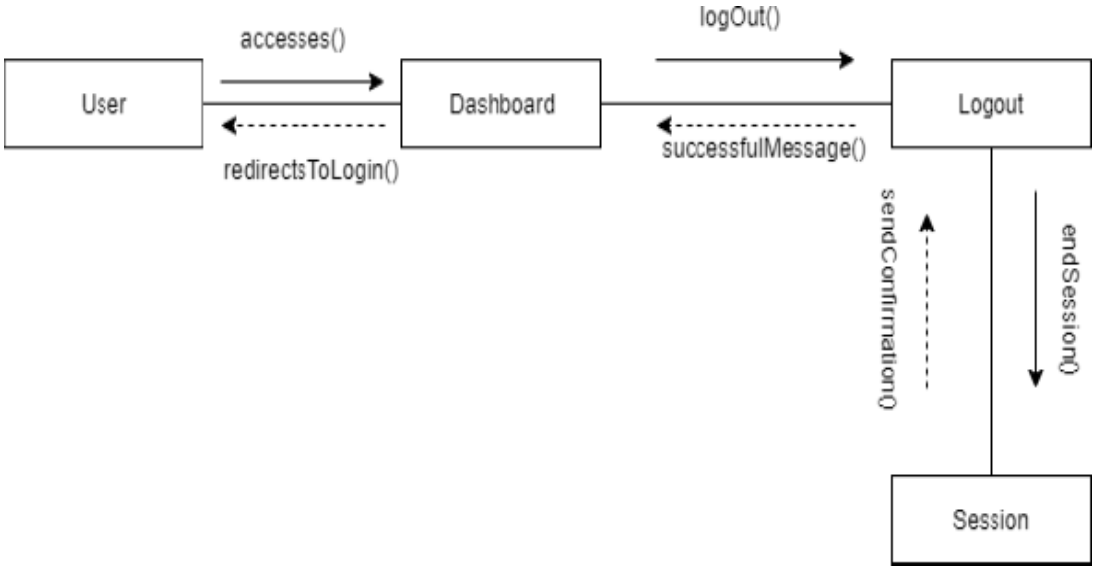
D: EDIT THE SETTINGS:



E: LOG OUT OF THE USER PORTAL:

The steps to log out, follow as below: User – Dashboard – Log out and then end of the session. The end of the session is followed by the end of the confirmation, that is sent to the user's personal display. It comes up and a small .text box item.



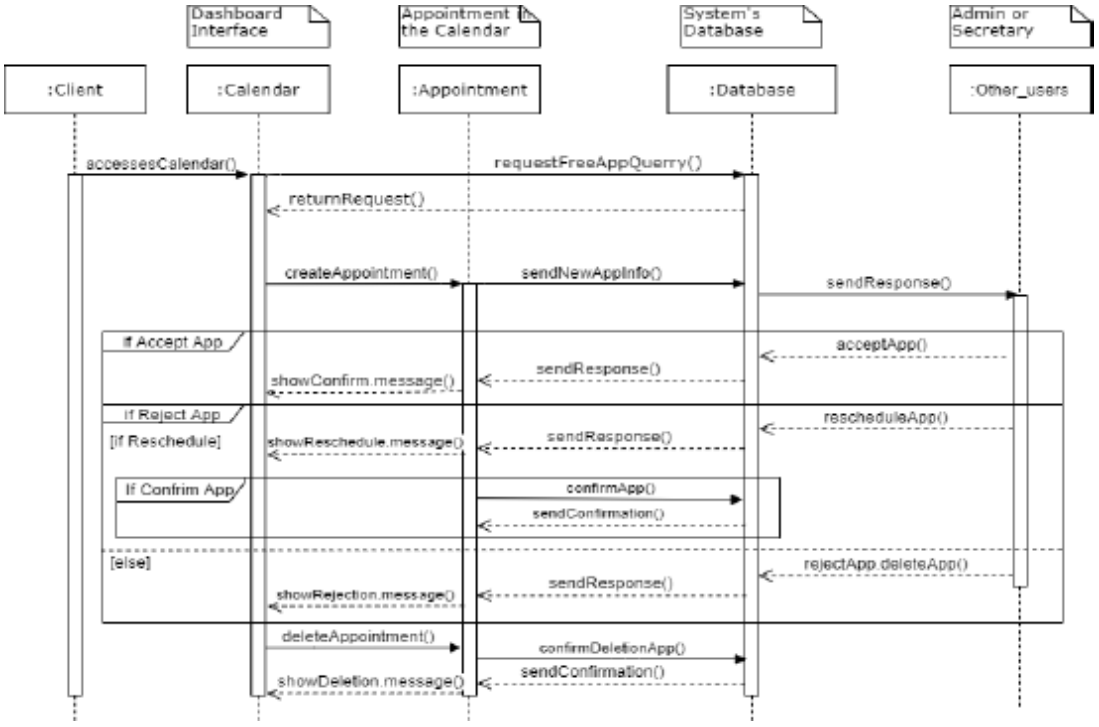


F: LOG OUT – PART 2; RETREIVE ACCESS AND LOG OUT

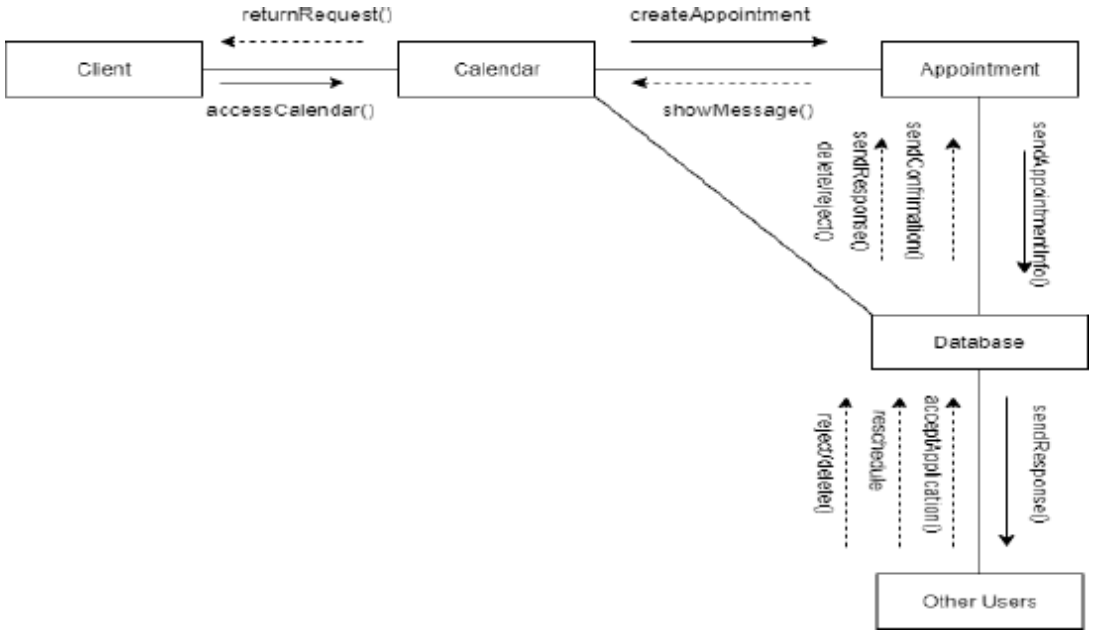
We follow these steps:

- User to Software.
- Dashboard to the log out session, here we either send successfulMessage(), or we insert the endSession().

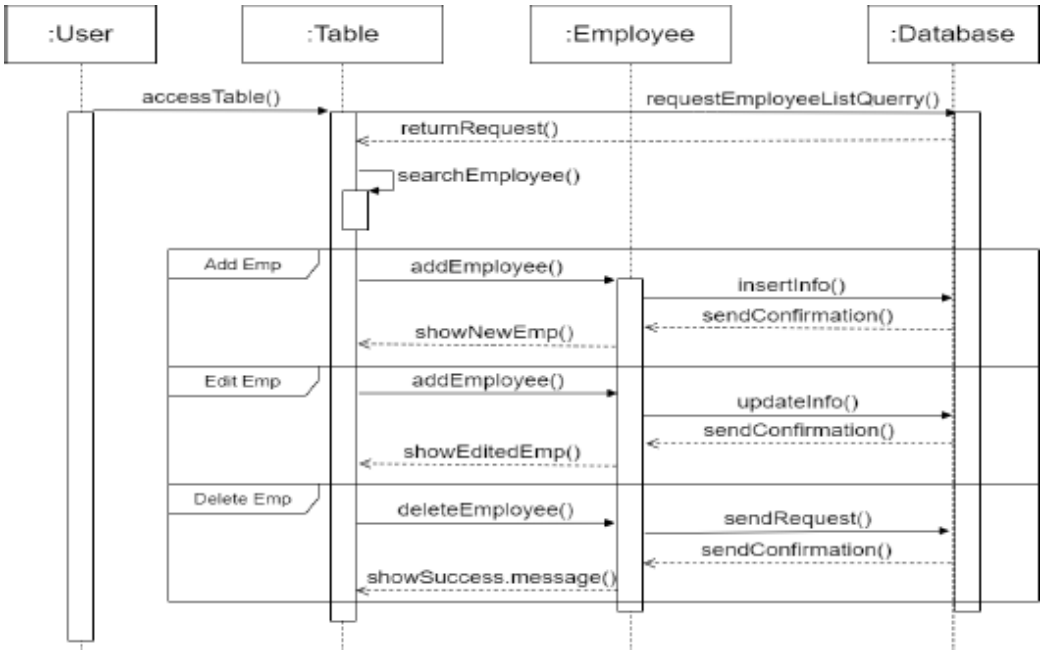
G: ADD A CV APPOINTMENT AND DATE OF SUBMISSION:



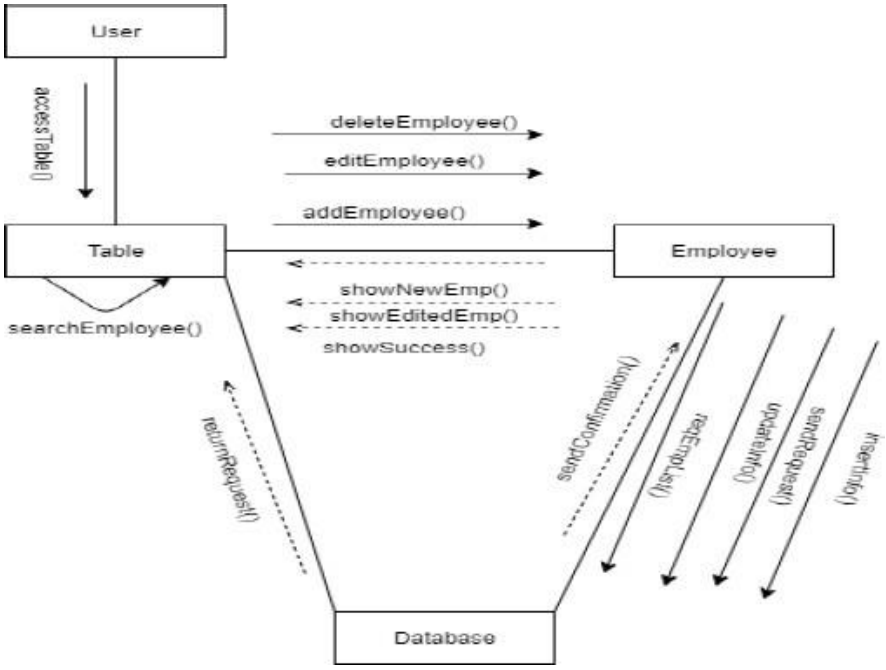
H: EDIT SUBMISSION AND DATE OF JOB APPLICATION, TO WHEN THE APPLICANT IS AVAILABLE.



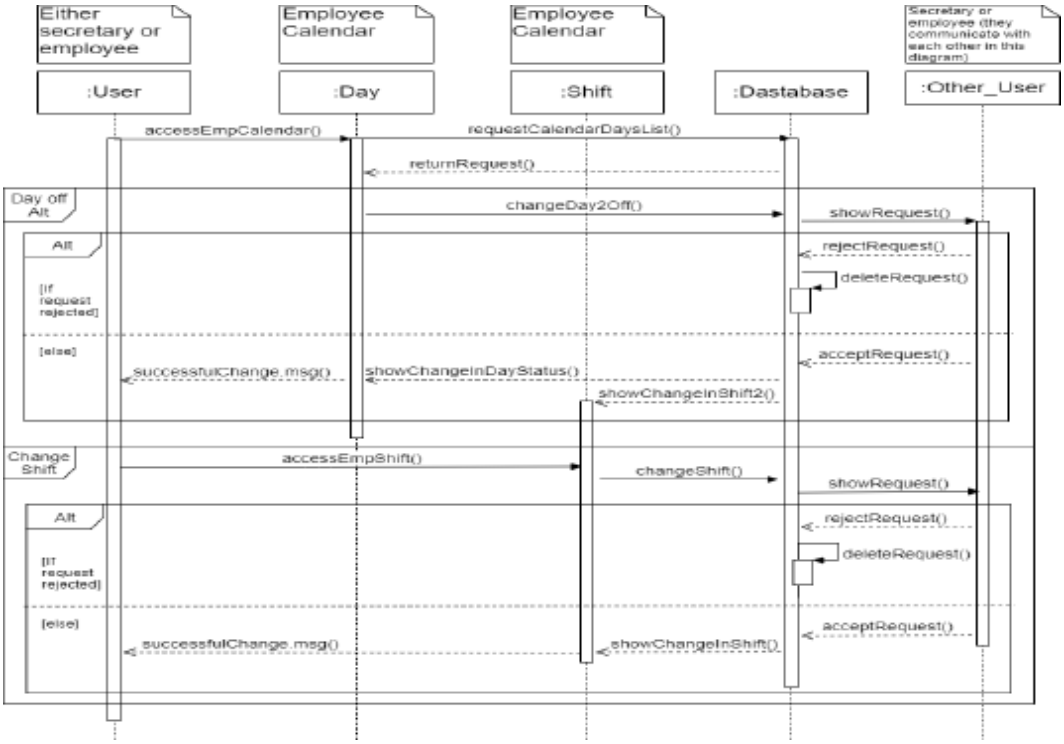
I: ADD EMPLOYEE OR DELETE FROM THE PORTAL, WHEN HE UNSUBSCRIBES:



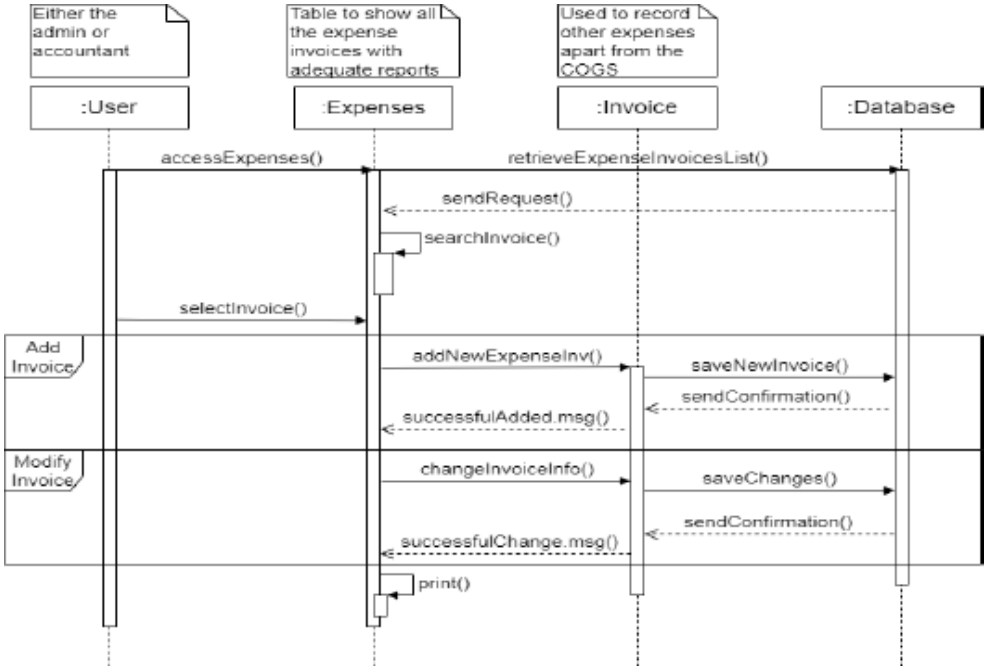
J: REGISTER, ADD OR DELETE EMPLOYEE:



K: CHANGE, APPROVE OR REJECT EMPLOYEE FROM THE APPLICATION:

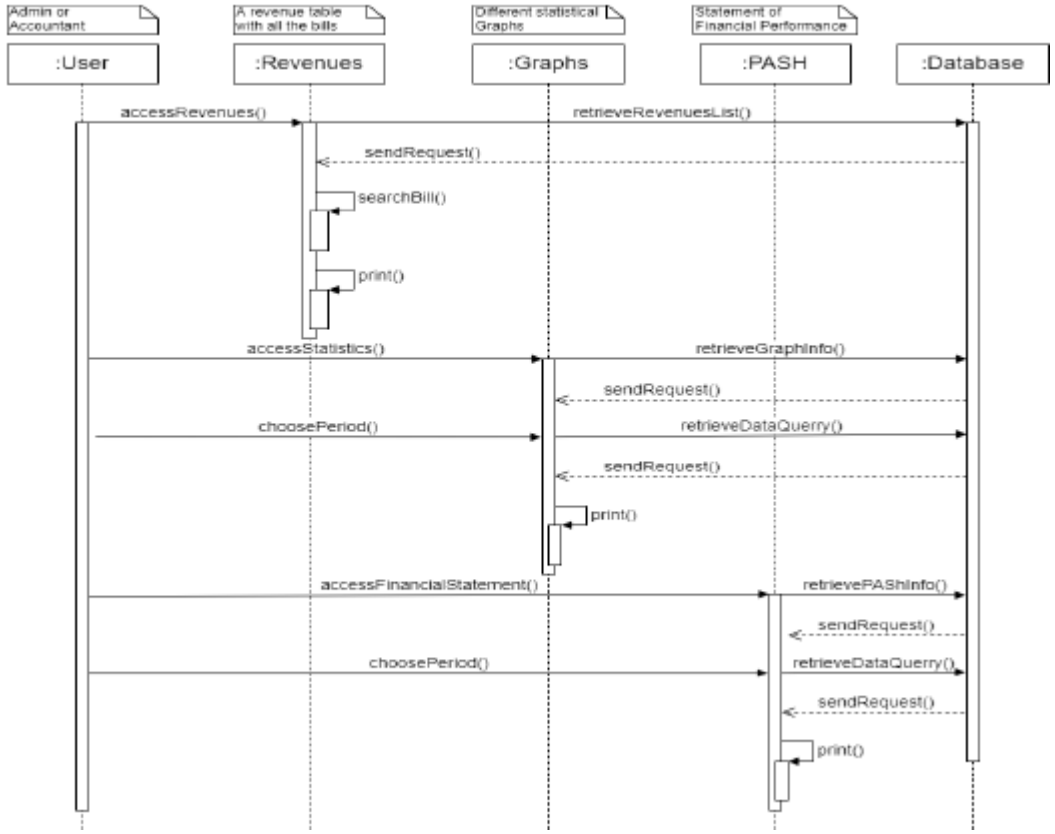


DOWNLOAD BILL INVOICE FROM THE SOFWARE, based on how much you paid for the onboarded people:

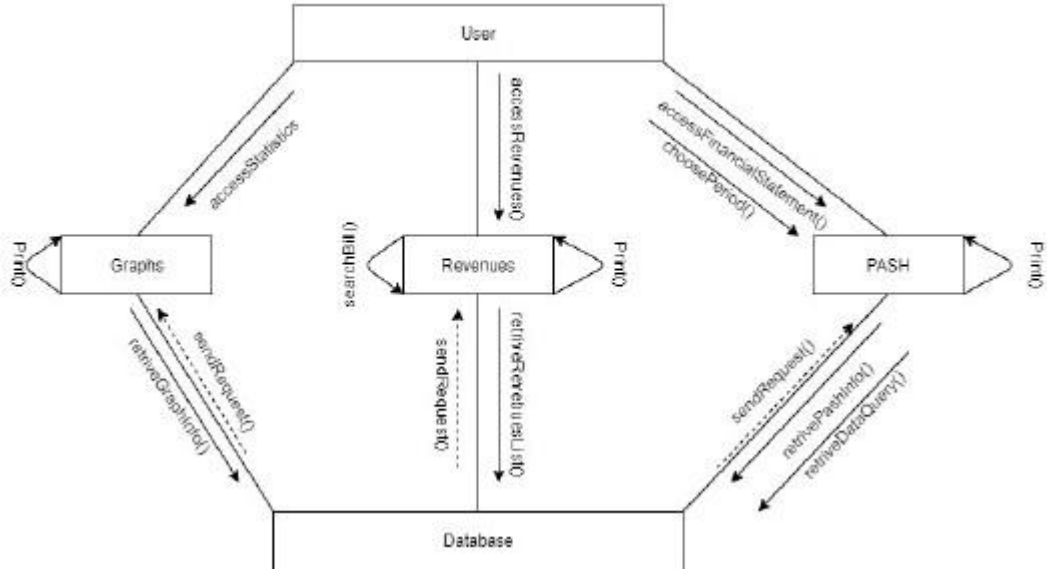


6 - **ACCOUNTING FORMULAS**, based on the expenses each of the interested parties, here the employee and the interested hire, so businesses, different corporates and hiring companies.

SEQ_21-24-25_Revenues, Statistics and Reports (Accounting)

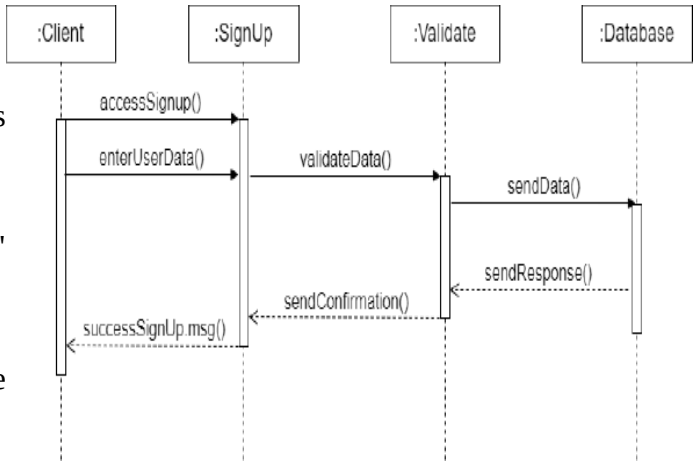


COL_21_24_25_Revenues-Statistics-Reports (accounting)

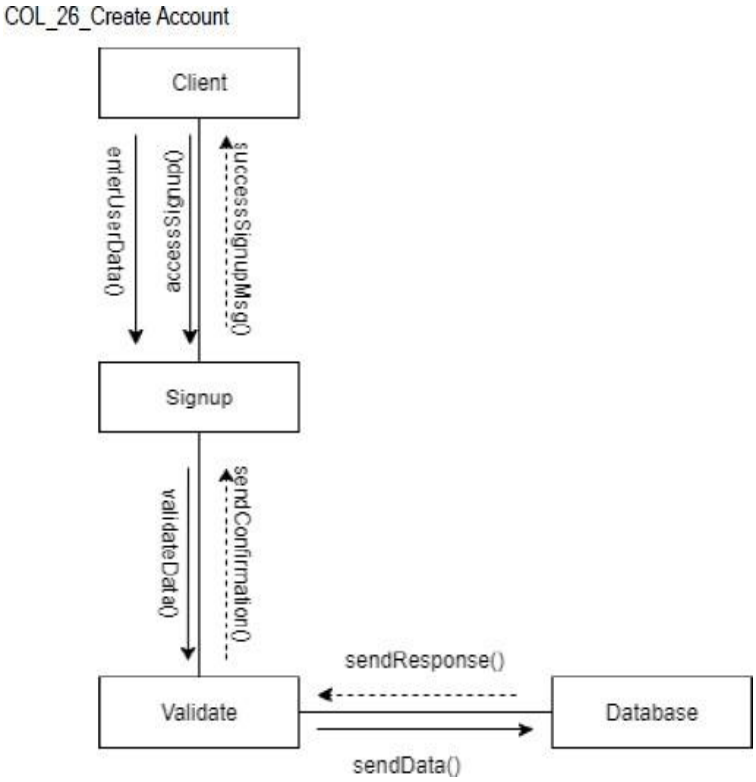


7 – REGISTER CLIENT ACCOUNT:

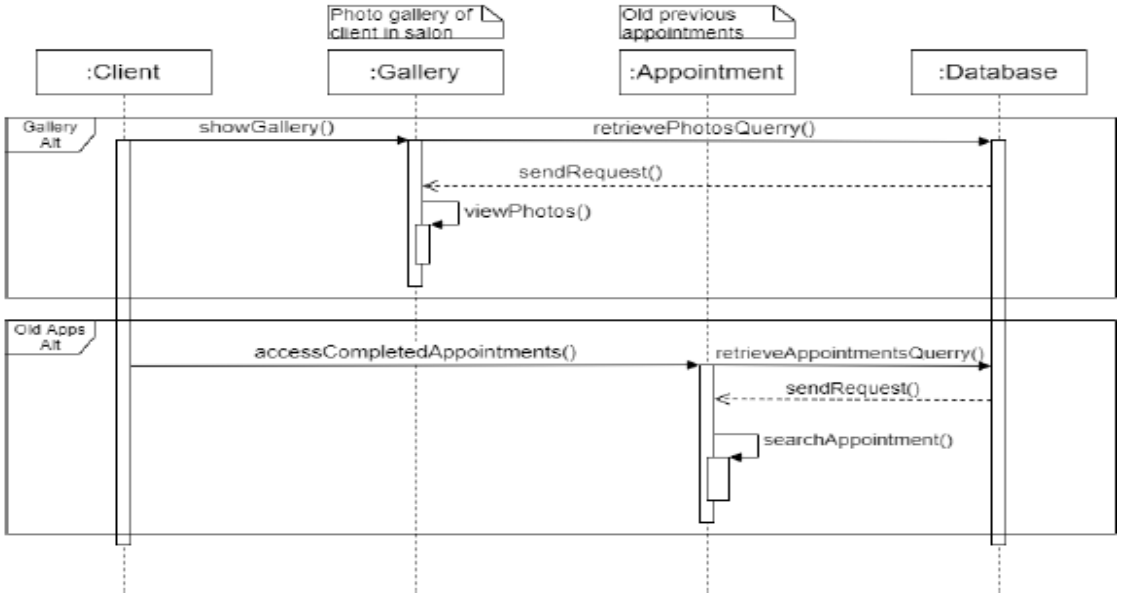
The logic follows as seen below:



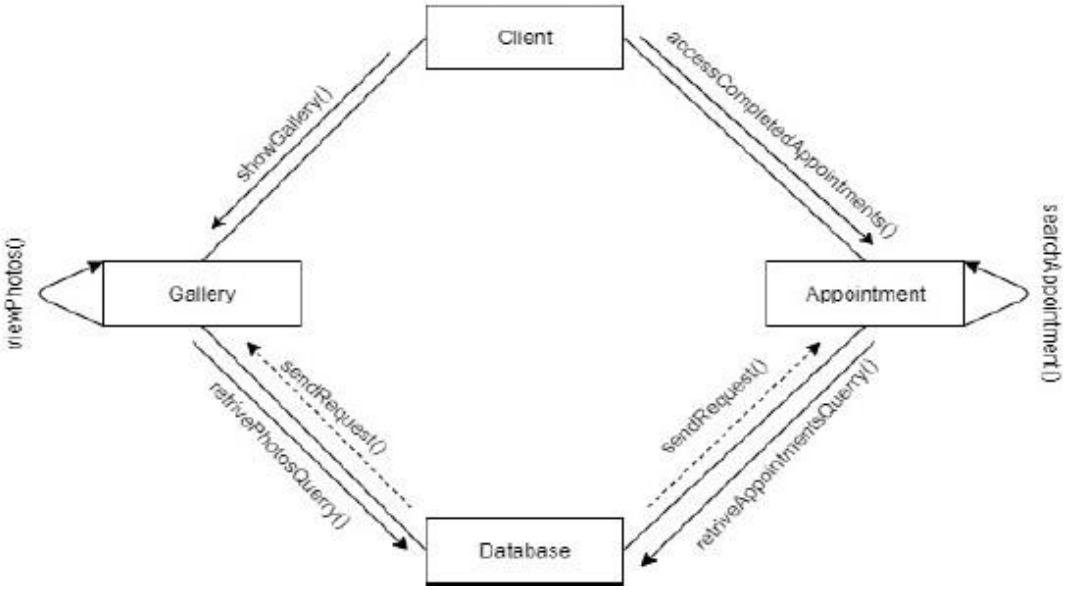
1. Go to the website or platform's homepage.
2. Look for a "Sign Up" or "Register" button/link.
3. Click on the button/link to start the registration process.
4. Provide your personal information, such as your name, email address, and password.
5. Follow any additional steps or prompts, such as verifying your email address or setting up security questions.
6. Submit your registration information and wait for confirmation that your account has been created.



SEQ_27-30_View Completed Appointments and Gallery by CLIENT



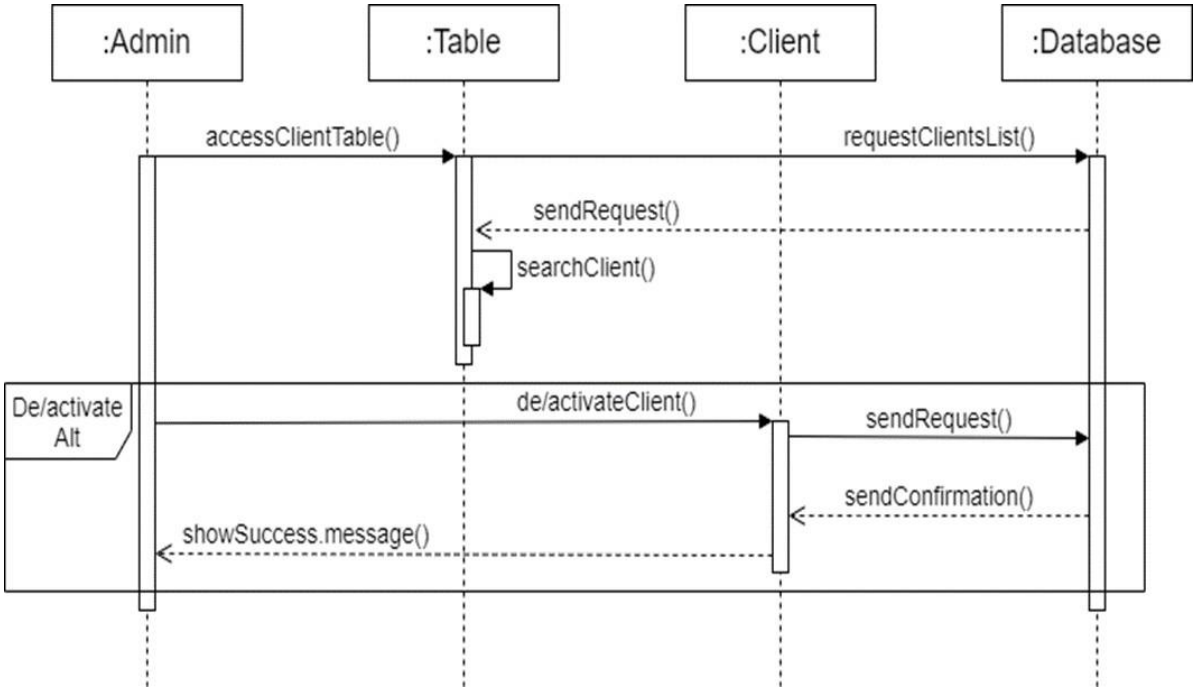
COL_27_30_View Completed Appointments and Gallery by CLIENT



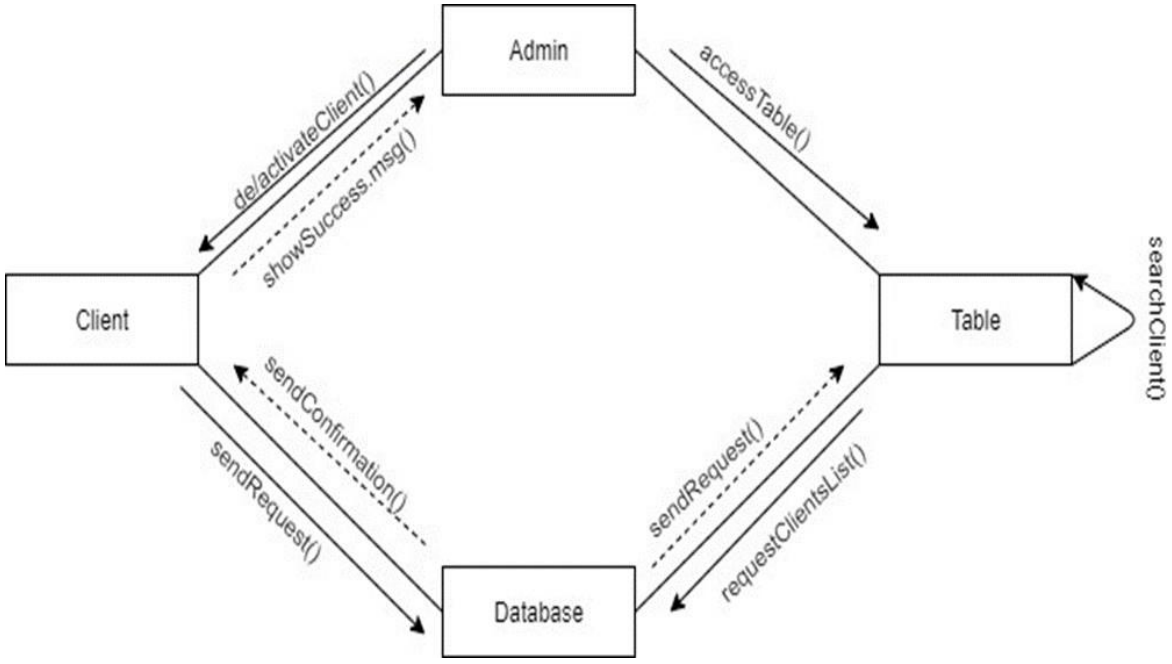
Finally, to check on how many applications were done under each account, we will have to go through these steps:

1. Gallery check – 2. Client name/company underwritten in. – 3. Appointment made under which job position. – 4. Database input in. This goes in an infinite circle, inputting all data in, one by one, per employee and job description.

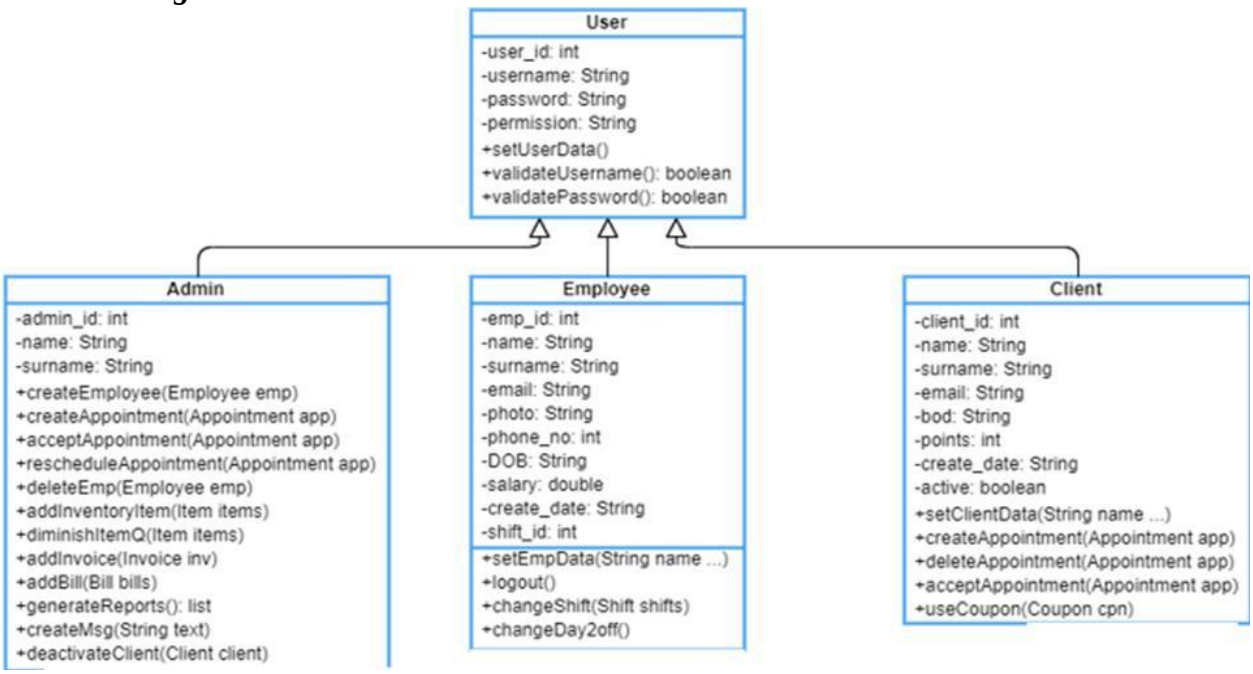
SEQ_37-38_View and Deactivate Clients



COL_37-38_View and Deactivate Clients



Class Diagram



A class diagram is a type of UML diagram that represents the structure of a system or software application in terms of classes, their attributes, and their relationships with other classes. Here are the main components of a class diagram:

Class: A class is a blueprint for an object in the system. It contains attributes that describe the object's state and methods that define its behavior.

Attribute: An attribute is a characteristic or property of a class that describes the object's state. It is represented as a name-value pair.

Method: A method is a function or behavior that a class can perform. It is represented as a name with optional parameters and return type.

Association: An association represents a relationship between two classes. It describes how objects of one class are related to objects of another class. An association can be unidirectional or bidirectional.

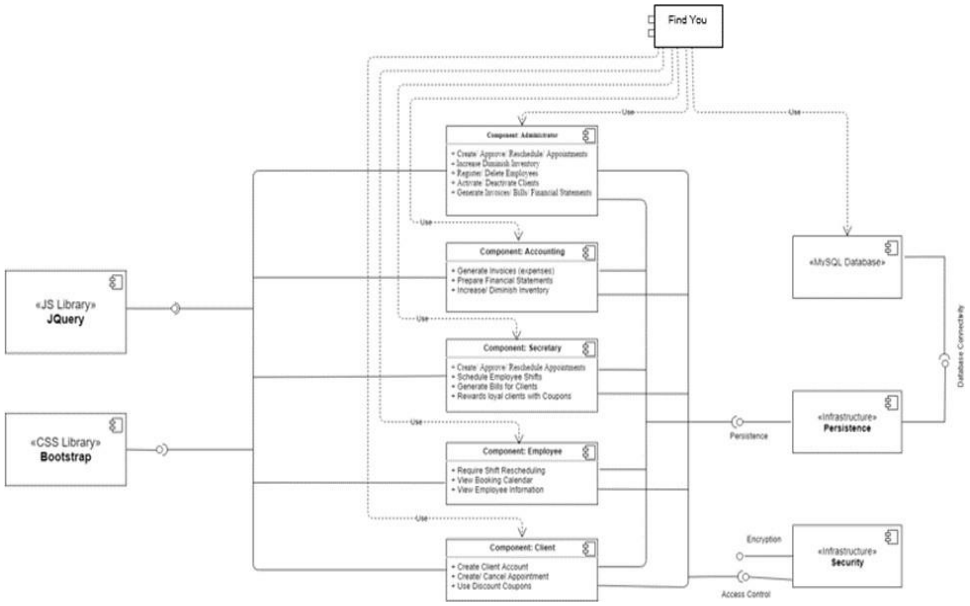
Multiplicity: Multiplicity is used to indicate the number of objects that participate in an association. It is represented as a range of values, such as "0.1" or "1. *".

Inheritance: Inheritance is a mechanism that allows a new class to be based on an existing class, inheriting its attributes and methods. It is represented as an arrow with an open triangle pointing to the base class.

Interface: An interface defines a set of methods that a class can implement. It is represented as a rectangle with the stereotype <<interface>>.

Stereotype: A stereotype is a tag that provides additional information about a class or other UML element. It is represented as a name in guillemets, such as <<abstract>> or
<<enumeration>>.
Class diagrams are useful for visualizing the structure of a system and can be used during the design and development phases of software development. They can also be used for communication between developers, stakeholders, and users.

Component and Deployment Diagrams



5. SOFTWARE EVOLUTION AND MAINTENANCE

5.1 Evolution

Evolution is simply a continuation of the development process based on frequent system releases. It is the stage in a software system's life cycle where it is in operational use and is evolving as new requirements are proposed and implemented in the system. As it is mentioned in the lectures the majority of the budget goes in maintaining the software. This happens because in order to maintain the maximization of profit the software must be updated over time. One of the advantages of software evolution is that it helps software in a software system environment connect with other changing systems, resolve bugs, and adapt to changing business requirements.

Software evolution or changes are inevitable for the following reasons: Software evolution or changes are unavoidable since many elements change over the life cycle of the software system. Here are a few of these elements: requirement alterations - As the software is being used, new requirements arise.

5.2 Maintenance

Software maintenance is to modify a program after it has been put into use. The term is mostly used for changing custom software. Generic software products are said to evolve to create new versions.

Type of maintenance:

Maintenance to repair software faults

▪ Changing a system to correct deficiencies in the way meets its requirements. (When the customer needs to change something in the system, we can repair it because sometimes it is the software faults.)

Maintenance to adapt software to a different operating environment

▪ Changing a system so that it operates in a different environment (computer, OS, etc.) from its initial implementation.

Maintenance to add to or modify the system's functionality

▪ Modifying the system to satisfy new requirements.

Advantage of software maintenance:

- Performance improvement.
- Fixes various bugs.
- Up to date with current trends.
- No need to spend extra bucks.

5.3 Program Code Redundancies

As we are aware, the phase of development in software engineering is a quite long process that is associated with some potential issues arising along the way. These are program code redundancies, which are considered as unnecessary code or even inefficient ones. This code may be subject to confusion, inconsistencies, inaccuracies etc. This is why we managed to pay attention to them, in order to avoid any type of inconvenience. Some types of redundancies are:

- Duplicated Code

When our code appears to be duplicated regarding its functions, methods, attributes etc. We faced some kind of similar code so then everything was settled and ensured the efficiency in our program.

- Long Methods

There are situations when methods appear to be quite long when actually we should restructure them into shorter ones. In this way, we can enhance the readability for the development team. Hence, sharing code among each-other will be easier too.

- Data Clumping

It occurs when the same group of data items is implemented in several locations within the code. Consequently, we used the encapsulation approach to further develop our program. This was achieved by replacing snippets of code by objects.

5.4 Business Value Assessment

A Business Value Assessment (BVA) is a tool utilized by companies to identify areas in which they can reduce expenses while improving operations. A BVA may help with discovering inefficiencies and areas for improvement by thoroughly reviewing present-day business processes.

Leveraging advances in technology for preserving time is common; this portal is a prime instance of working smarter, not harder. Companies and job seekers understand the benefits of conducting their job searches online since they can do so more quickly and for less money.

Main questions for BVA:

1. Is there a defined process model and is it followed?

The process model we have decided to use for the implementation of this system is an agile process. It encourages continuous iterations of development and testing. Each incremental part of Job Portal is developed over an iteration, and each iteration is designed to be small and manageable so it can be completed within a few weeks.

2. Do different parts of the organization use different processes for the same function?

Yes, in our project development some part of the organization has used the waterfall model for development. It is the most traditional software development method. It is focused on distinct goals. Each phase of the project was 100% complete before the next phase could start.

3. What are the relationships with other business processes and are these necessary?

An organization's business processes are the set of specific actions or steps that are taken in order to complete a task or activity. Meanwhile, IT is the hardware and software that are used to collect, store, process, and distribute information. The two are related in that business processes rely on systems to function. Business processes are simulated to see how they would work in different scenarios, or to test out new process changes. Meanwhile systems can be used to store data from simulations.

4. Is the process effectively supported by the legacy application software?

A legacy application, or legacy app, is a software program that is outdated or obsolete. Yes, the process is supported by the legacy application software. The business value of a legacy system and the quality of the application should be assessed to help decide if a system should be replaced, transformed or maintained.

REFERENCES

https://ca.indeed.com/career-advice/finding-a-job/what-does-application-software-developer-do

https://www.diginnovators.com/blogs/changing-requirements-in-software-development/

https://www.xebrio.com/requirement-change-management/

https://classroom.google.com/c/NTQzMTc2MDg4NjMw

https://online.hbs.edu/blog/post/change-management-process

https://visuresolutions.com/blog/requirements-review/

https://ecomputernotes.com/software-engineering/what-are-requirement-reviews

https://www.dummies.com/article/business-careers-money/business/general-business/how-to-conduct-a- requirements-review-for-business-analysis-162470/

https://iteo.com/blog/post/why-is-consistency-so-important-in-software-0websites