JOB4CS: A JOB PORTAL FOR COMPUTER ENGINEERS

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A project report submitted in partial fulfillment of the requirements for the degree of

Bachelor of Science in

Computer Science and Engineering

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COMPUTER SCIENCE AND ENGINEERING

UNIVERSITY OF LIBERAL ARTS BANGLADESH

SPRING 2021

DECLARATION

I declare that this project entitled "JOB4CS: A Job Portal for Computer Engineers" is the result of my own research except as cited in the references. The project has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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CERTIFICATE

This is to certify that project report entitled "**JOB4CS: A Job Portal for Computer Engineers**", submitted by **Abdulla Al Numan** (Student ID: *172014013*) is an undergraduate student of the **Department of Computer Science and Engineering** has been examined. Upon recommendation by the examination committee, we hereby accord our approval of it as the presented work and submitted report fulfill the requirements for its acceptance in partial fulfillment for the degree of *Bachelor of Science in Computer Science and Engineering.*

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Abdulla Al Numan

University of Liberal Arts Bangladesh

Date: June 12, 2021

To my mother
Juhara Begum
and father
Md Musle Uddin
–Abdulla Al Numan

ABSTRACT

Job portal is a very common platform uses by job seekers to find out best suitable jobs according to their skills and expertise as well as it helps employers to choose the most preferable employee for an organization from a wide range of candidates. In this era of internet, a job portal is the most effective platform to make easy interaction between employers and job candidates. As a result, a number of job portals are available in different nations besides some portals are internationally or regionally or intercontinentally recognizing.

This project work is a special of kind of job portal web application oriented only for Computer Science (CS) and Engineering filed. The approach is to connect the computer science community and its expanding branches to develop a unique a platform for searching jobs based on programming skills, computer science degrees and other CS specializations. This web application is featured with job suggestion based on selected preferences in addition each candidate can upload three CV to apply different jobs with different credentials. Moreover, a discussion forum is developed to make an active interaction between all kinds of users. As well as, two other famous job portals IT and telecommunication part is included here by embedding to facilitate the CS job seekers providing most of the available job opportunities at a one place.

Additionally, employers can post about job vacancies in details including programming skills they want to emphasize. In a word, this job portal maintained the conventional features need to have in a usual job portal except the job posts are only for CS candidates.

Keywords: portal, job, posts, user, CSE

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1. Introduction

1.1 Objective

JOB4CS is a job portal web application for CSE students or candidates of Bangladesh to find out their desired job opportunities and supports recruiters to get their suitable candidates at a one place. This job portal is open for anyone to visit and brows job posts are posted by users of this site as well as can check the most popular and highest Bangladeshi available job posts on IT& Telecommunication segment of “bdjobs.com” [2] and search result of CSE jobs in Bangladesh at “careerjet.com.bd” [5]. This project work tried to build a flexible job portal for CSE peoples rather than other job portals conducts all kind of job posts and most of the time original CSE related job posts get blended with other kind of job posts. As a result, CSE candidates spend extra time to figure out their kind of jobs as well as employers get a lot of applications those are not suitable with their circulated qualifications and skills. This job portal helps to get rid of this hassle and conducts only CSE oriented jobs, candidates and employers.

In summary, this job portal is a small approach to paradigm that particular field focused job portals are needed for few job markets like computer science that includes a lot of branches, degrees, skills, categories, programming languages etc.

1.2 Motivation

The main inspiration regarding this project came from my early stage of undergrade study when I was confused about to learn which programming language from a range of options as well as my idea about job market against several programming skills was totally nil. Consequently, from that past experience I felt that armature CSE students need a distinct job market to have some idea about which programming skills they need to acquire for achieving desired career in future. Besides, new comers required to determine a goal without any difficulty at the early stage of studying CSE to work on this site dedicatedly without any confusion. Afterward, taking all the above-mentioned facts in concern this resultant job portal came out as a resolution that can be an effective approach to resolve an CSE studying amateur’s career related confusions.

1.3 Development Model

For developing this web application, I followed iterative waterfall model that is update of the conventional waterfall development models that executes linear and sequential tactic. It refers as waterfall because this developmental process shifts phases in a descending style. This model separated into several stages and outcomes of one stage utilizes as input of succeeding stage. It also allows to fix error of one stage from later stages via feedback paths. Consequently, there is no overlapping between the phases cause each phase has to be finished before jumping to the following phases.

This development model has following advantages:

1. It's popular for its simplistic usability and non-complex structure.
2. Each phase has precise outcomes and analysis report for managing easily.
3. Useful for smaller scale works where requirements clearly defined.
4. Developing processes and outcomes are perfectly preserves by careful documentation.

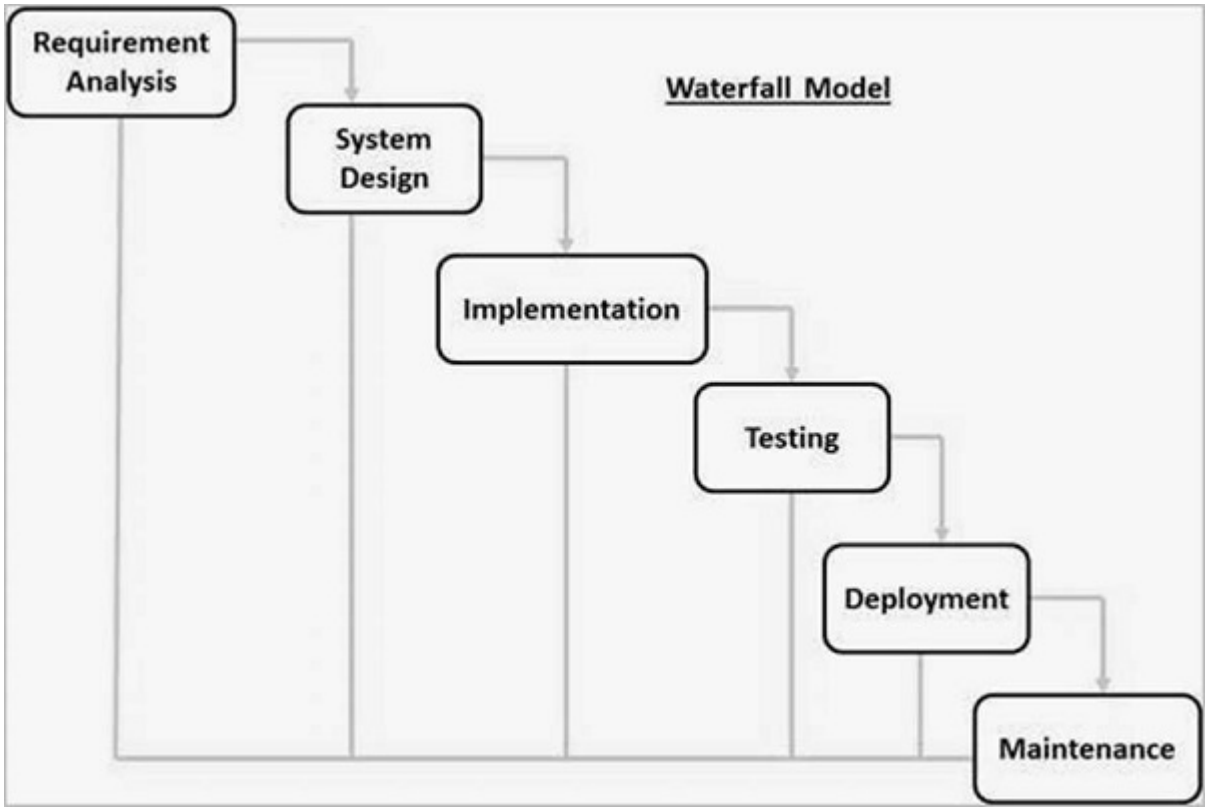

Fig 1: Waterfall Model

Fig1 refers to iterative waterfall models six phases and feedback paths of every stage to the next and previous stage.

2. Literature Review

Job portals are a part and parcel of every internet accessible nation to search out suitable jobs across the country or region. Job portals has overcome the popularity of advertising in newspapers for job vacancies due to the flexibility of updating, anytime posting and easily reachable to candidates within a short time. Moreover, job portals are less expensive than newspaper ads [6].

2.1 bdjobs.com:

bdjobs.com is a popular job portal in Bangladesh that covers all kind of job posts and supports job applying facilities for a huge number of job seekers as well as for employers. In this job portal job posts are divided into twenty-seven categories for the simplification of job finding process [1]. This organization has lots of features and services like training, courses, testing etc. With the time being it is introducing more and more features daily for the increasing number of visitors. The number of daily new job posts are more than three hundred and daily genuine visitors' amount is 200000(two hundred thousand) on average [3]. Therefore, this job portal holds a larger community that's why from a huge number of jobs posts it is kind of difficult for CSE students to find programming language-based job posts specifically, even sometimes in IT/Telecommunication segment contains other departments degree holders job posts that is not fully linked with CSE skills and degrees [2]. In addition, CV switching options for different kind of jobs is not available in bdjobs portal. Moreover, having a several number of categories employers hesitates to post in which category sometime they miss the accurate segment where the vacancy circular belongs to.

2.2 careerjet.com.bd

This is an international job portal that consists country switching mood and shows region wise job posts [4]. This portal does not have that much popularity like bdjobs.com as well as here don't have any category wise job post sorting option to find one type of jobs in a single tab rather users have to search with specific keywords to explore job posts they want to observe. Additionally, this portal saves user past search history keywords and number of results in the home page for users' conveniences. Another service of this portal is creating CV following their concreate formats by filling up several forms that is really time consuming. In summary, it is a conventional job portal with few required services and have native domains for individual ninety (90) countries as well as have twenty (28) languages supports [7].

3. Requirement analysis

Requirement Analysis is one of the primary and significant phases in any kind of development activity for constructing a robust and user-friendly web applications. At the beginning, I started researching and settling down the functionalities of the services that the web application should provide. Next, I have done an adequate amount of study on present systems and explored what are the drawbacks of them. When the functional requirements are completed, I switched my inspection on the existing popular browsers, suitable programming languages and supporting features. Later, I met with my supervisor and decided to develop a job portal web application for CSE related job seekers.

Requirement Specifications

Below are the technical requirements to develop

3.1 Software Requirements

- Operating System: Windows 10
- IDE: repl.it, Notepad++
- Database: MySQL, XAMPP Control Panel 3.2.4
- Front End: HTML5, CSS3, JavaScript, jQuery
- Web Service: Apache HTTP Server 2.4.46
- Browser: Chrome or Firefox or Microsoft Edge

3.2 Hardware Requirements

- Processor: Intel core i5
- Processor speed: 2.70 GHz
- RAM: 8 GB

4. System Design

Systems design refers to illustrate the phases such as planning, mechanisms, modules, interfaces, elements and data flow for a development to fulfill enumerated requirements [8]. via UML diagrams are one of the flexible ways to demonstrate a system's designs incorporating object-oriented analysis and design language. The UML consists a set of diagrams and standard collection of symbols for specifying and imagining several aspects such as requirements and design of software systems.

4.1 UML Diagrams:

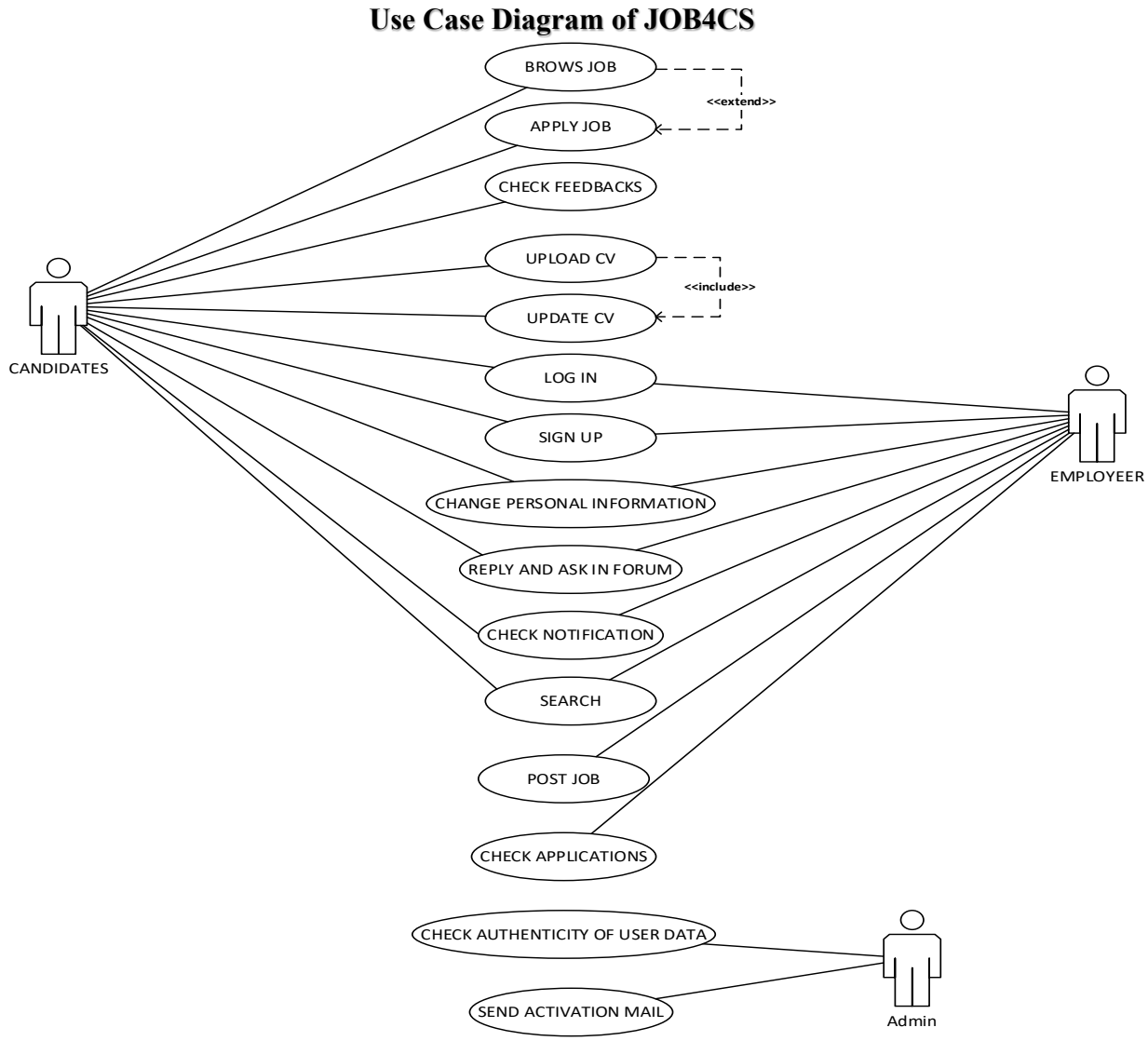

Fig *2:* Use Case Diagram

Fig2 is use case diagram that depicts the two main users' activities and admins roles at the backend.

4.2 ACTIVITY DIAGRAM

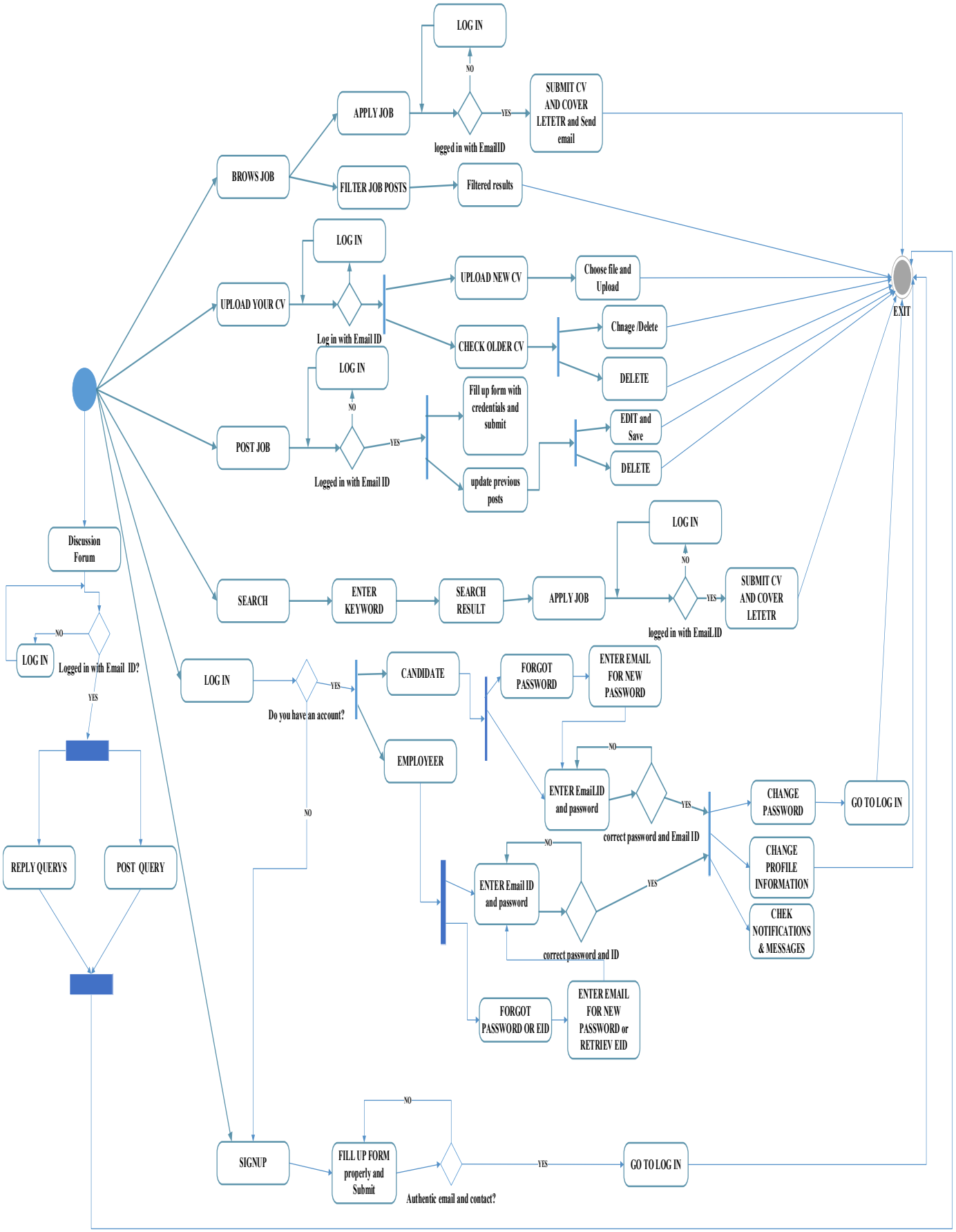

Fig3:Activity Diagram

Fig3 is the Activity Diagram of JOB4CS is revealing the behavioral aspect of this project by picturing the flow from one activity two another.

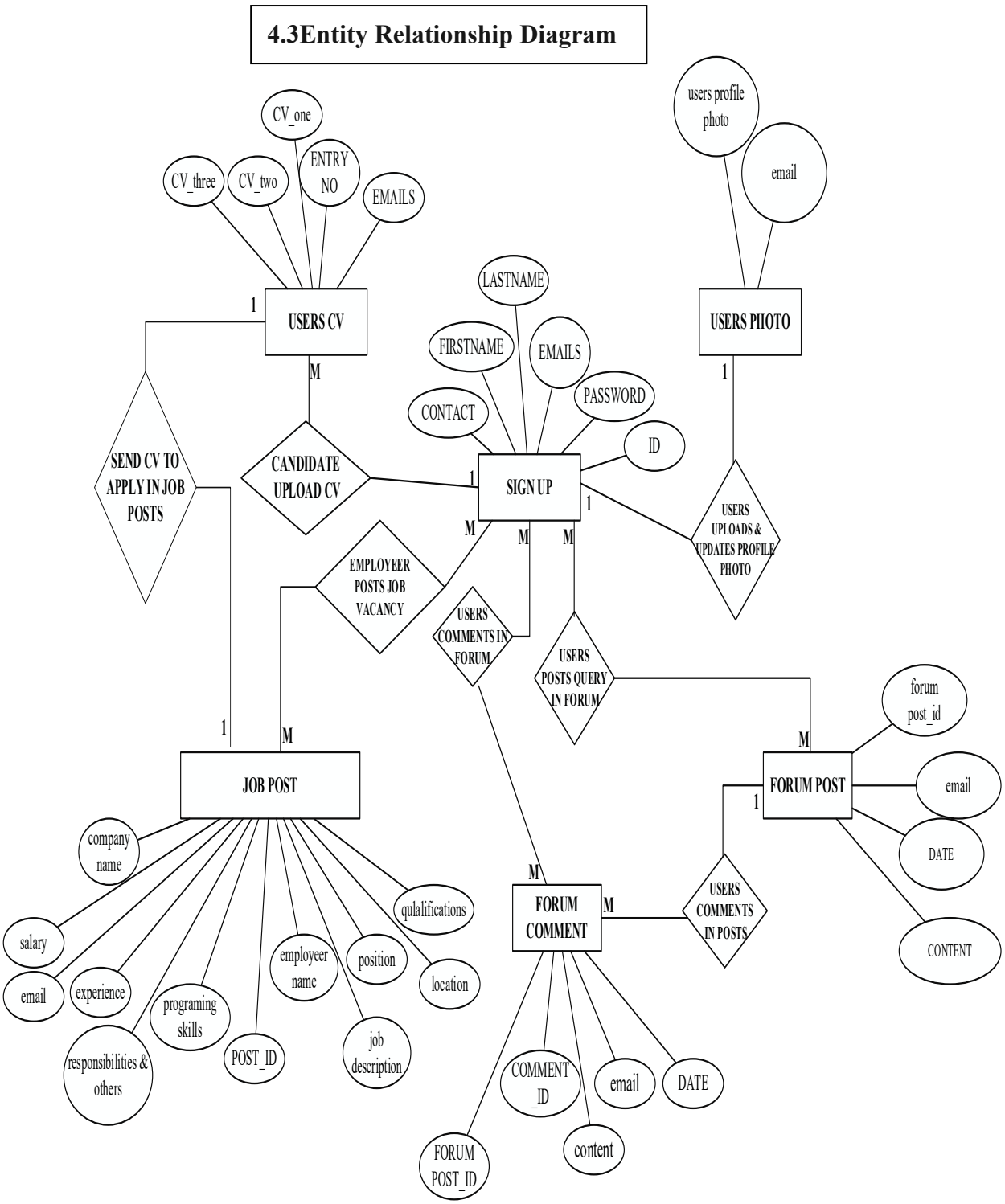

Fig 4:ER Diagram

Fig 4 is showing the entity relationship diagram and portraying the binary relations between entities by one to many or one to one or many to many edge notations.

4.4Class Diagram of JOB4CS

Class diagram is the object-oriented modeling and structure of the application, which contributes to coding implementation.

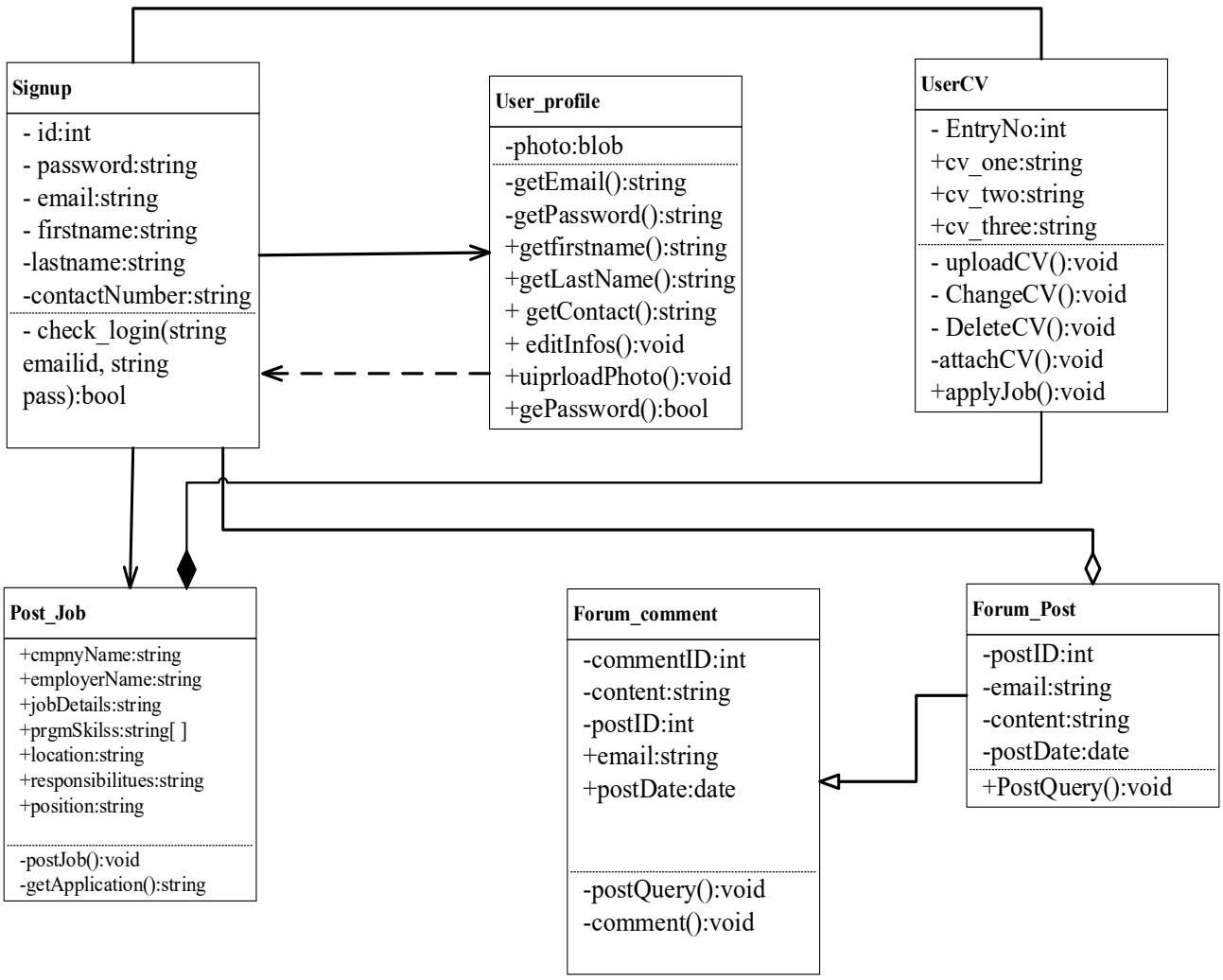

Fig 5: Class Diagram

Fig 5 is the Class diagram of this project to execute object-oriented features and provides a static view of this system.

4.5CONTEXT LEVEL 0 DFD

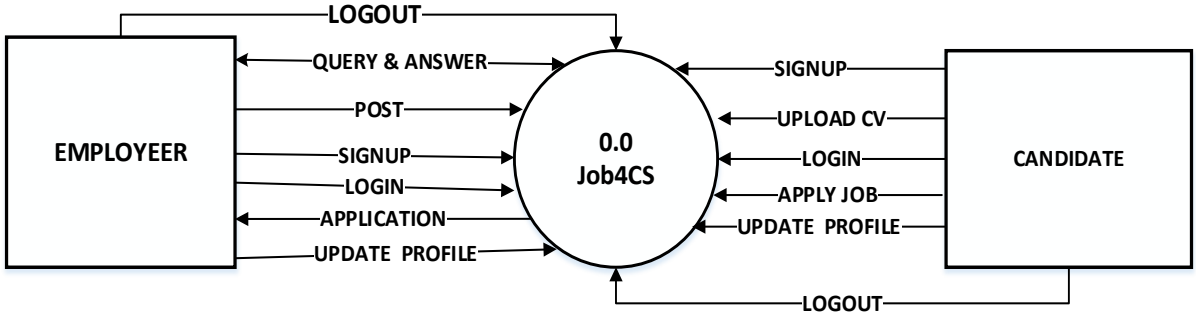

Fig 6: Context level 0 DFD

4.6 LEVEL 1 DFD

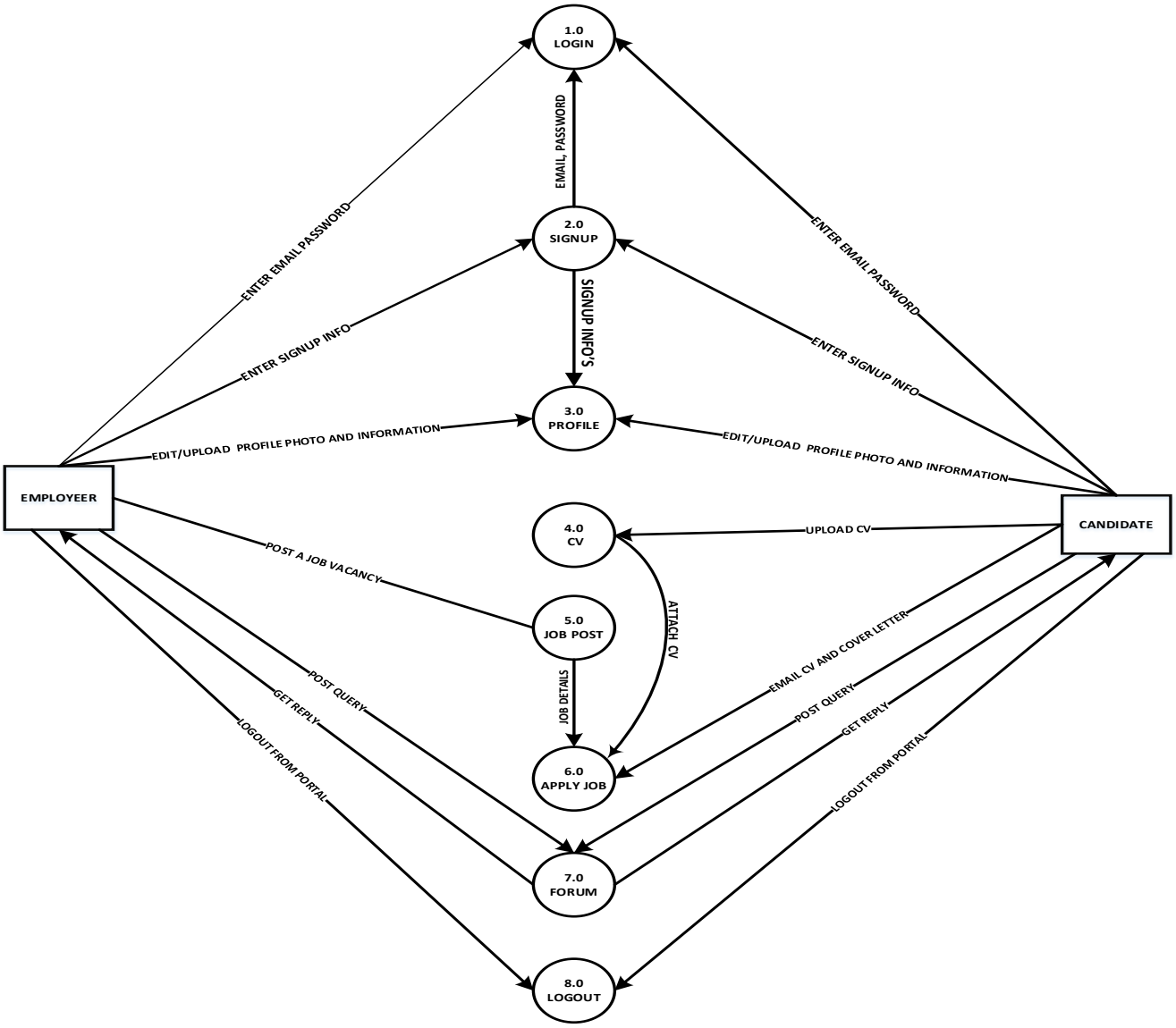

Fig 7: LEVEL 1 DFD

Fig 6 and **Fig 7** are the DFD diagrams representing the data flow from one entity to another.

4.6 Schema Table

Table Names:

1. signup

2. users_photo

3.post_job

4. forum_post

5. forum_reply

6.users_cv

1.Signup

Column	Type	Size
id	int	11
Firstname	varchar	100
Lastname	varchar	100
contact	varchar	30
email	varchar	100
password	varchar	255

Table 1:Signup

Table 1 is designed to store registered user's data for further log in authentication and tracing users' other activities via stored email address.

2.users_photo

Column	Type	Size
user_email	varchar	255
profile_image	blob	555

Table 2: Users Photo

Table 2 is storing users uploaded profile pictures against their signed-up emails.

3.post_job

Column	Type	Size
post_id	int	20
email	varchar	255
cmp_name	varchar	255
emp_name	varchar	255
description	varchar	255
position	varchar	255
qualification	varchar	255
prgm_skills	varchar	255
experience	int	10
location	varchar	255
respon	varchar	255
salary	int	11

Table 3: Job Post Table

Table 3 is storing all the job posts are published by employers against their email address and providing post id as future referance.

4.users_cv

Column	Type	Size
email	varchar	255
Cv_One	varchar	255
Cv_two	varchar	255
Cv_three	varchar	255
EntryNo	Int	10

Table 4: Users CV

Table 4 is for saving job seekers three CV in the system thus they can apply for job easily.

5.Forum_comment

Column	Type	Size
comment_id	int	11
post_id	int	11
user_email	varchar	255
content	varchar	500
date_posted	varchar	500

Table 5: Forum comments

Table 5 is for storing comments according to the post id which are done by users in different posts or queries.

6.Forum_post

Column	Type	Size
post_id	int	11
user_email	varchar	255
content	varchar	500
date_created	varchar	500

Table 6: Forums Posts

Table 6 is storing the posts or queries are published by users in time line of referencing their email address and name.

5. User Interfaces and Functionalities'

User Interface of JOB4CS has been developed combining five different languages HTML5, CSS, JavaScript, jQuery and a bit of Bootstrap incorporated to contribute a user-friendly interactive web pages, screens and the navigation between screens, tabs. As well as, PHP used for backend development and server-side connectivity's.

Regarding all the User Interfaces are discussed below:

5.1) Home page:

Home page consists three switching tabs one is job posts to display all the job vacancies are posted by users in this web app, then another tab contains bdjobs IT/Telecommunication job posts as an embedded page, the last page is embedding another job portal careerjet.com.bd. Consisting buttons are Home, BDJOBS, Login, signup, Upload CV, Post A Job Vacancy. if user logged in log and signup button disappears and Your Profile button appears. Moreover, after logged in another switching tab will appear named "Suggested Jobs" to display programming language wise job suggestions.

Home page before logged in Fig__, without logging in users cannot use any other services except browsing job posts.

Fig 8: Home Page

Fig 8 is the snapshot of Home Page of this portal before users logged in

5.2Signup & Login

Signup:

This is signup form for users to register by filing up credentials like name, contact, email and password. Later email and password will be needed to login and accessing all the features.

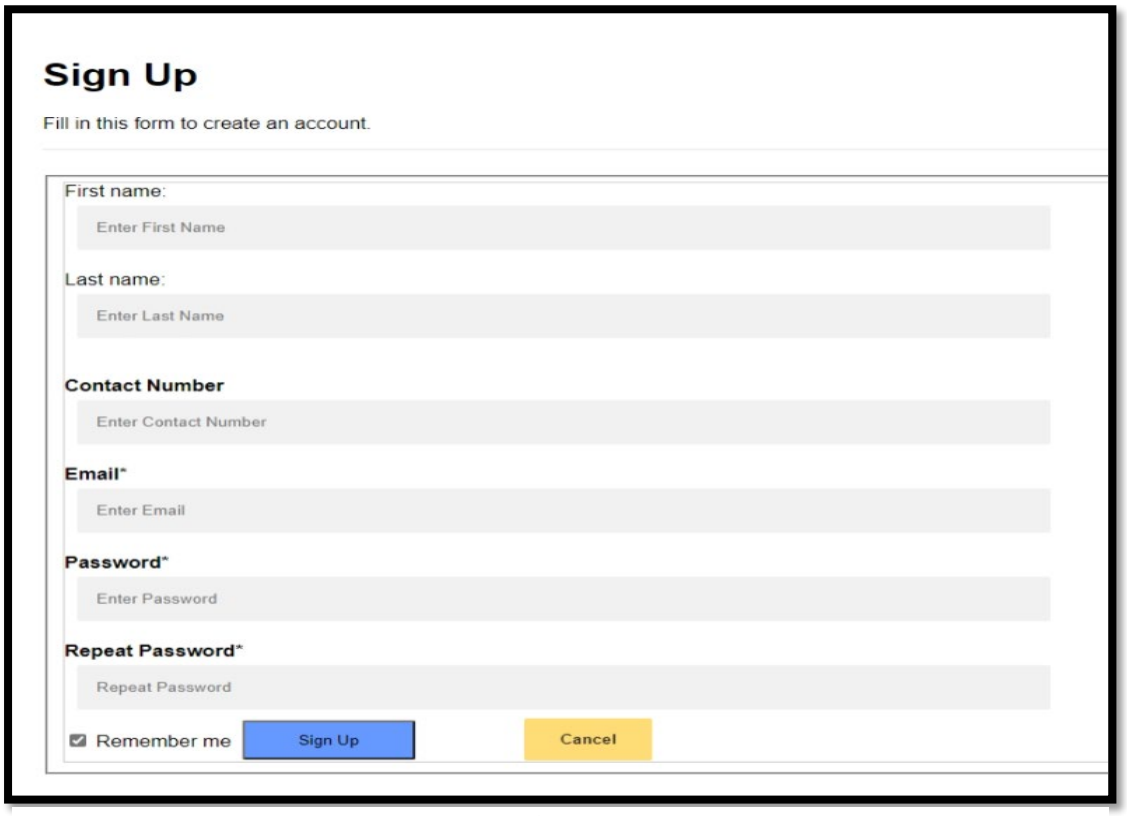

Fig 9: Signup Page

Fig 9 is the snippet of sign-up page with several text boxes and users required to fill up all the information's.

Login: Users log in by providing email and password they saved while signed up

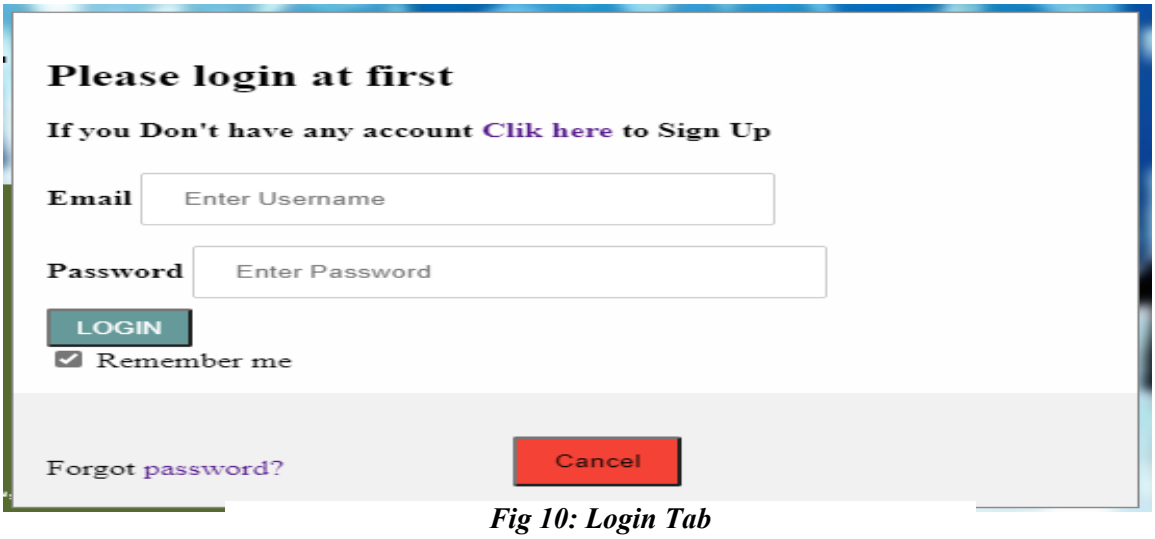

Fig 10: Login Tab

Fig 10 is the viewing the log in tab where have options like forget password and sign up if don't have any account.

5.3 Logged in successfully:

Suggested job posts, your profile and Logout button appeared, now a user can access all the services like applying job, cv upload, post job and also can join discussion forum. Along with, search and bdjobs button are active always to brows job posts and in suggested job posts user can explore desired job post by marking checkbox of programming language names.

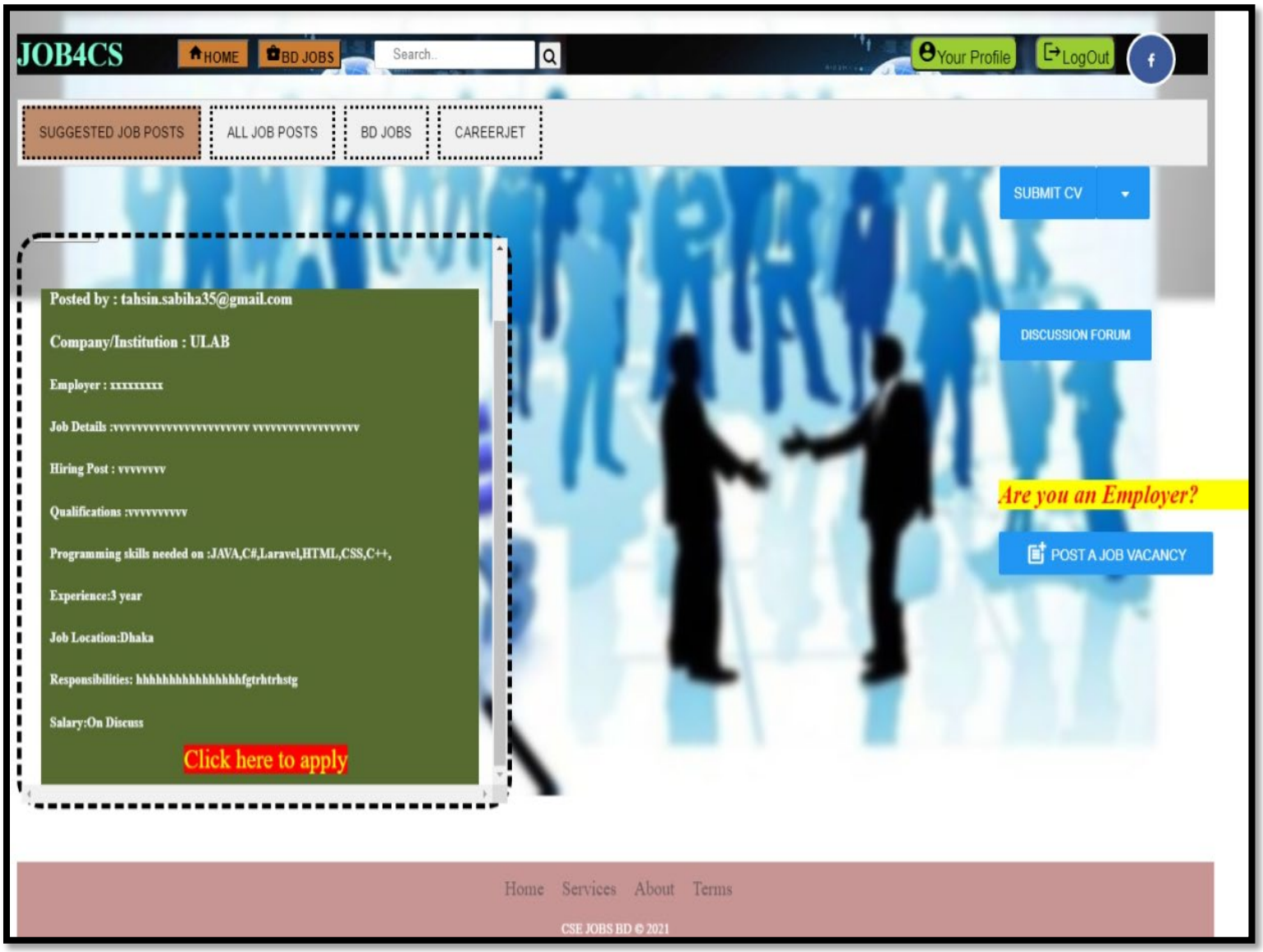

Fig 11: Logged in Home Page with suggested job post tab

Fig 11 is displaying the home page after log in where profile button and logout is appearing replacing login and signup.

5.4 All Job Posts Tab: This tab contains all the job posts on this site and every job post consists individual apply button.

Fig 12:All Job posts tab

Fig 12 displaying all the posts in a scrolling view in individual div and each div containing apply job button

5.5 BD JOBS IT & Telecommunication tab: In this tab users can brows IT & Telecommunication jobs of bdjobs.com that hold the highest number of job posts comparing all the job portals of Bangladesh [1].

Fig 13 BD JOBS tab

Fig 13 is the embedded view of BD jobs tab where users can only brows all the IT jobs

5.6 careerjet.com.bd Tab: This tab embedding the search result of CSE jobs is Bangladesh at carrerjet.com.bd. It is a country wise international job portal covers more than 90 nations job market [7].

Fig 14: careerjet.com.bd tab

Fig 14 is the embedded view of Careerjet.com.bd CSE jobs in Bangladesh

5.7 Your Profile page: This page displays users profile info and enables user to upload or change profile photo with edit page button.

Fig 15: Your Profile Page

Fig 15 is the users profile view including upload or change photo option as well as edit button for visiting edit info page

5.8 Editing info and Password change page: This page has two part left part dedicated to let user change his/her registered information and left part is for changing password.

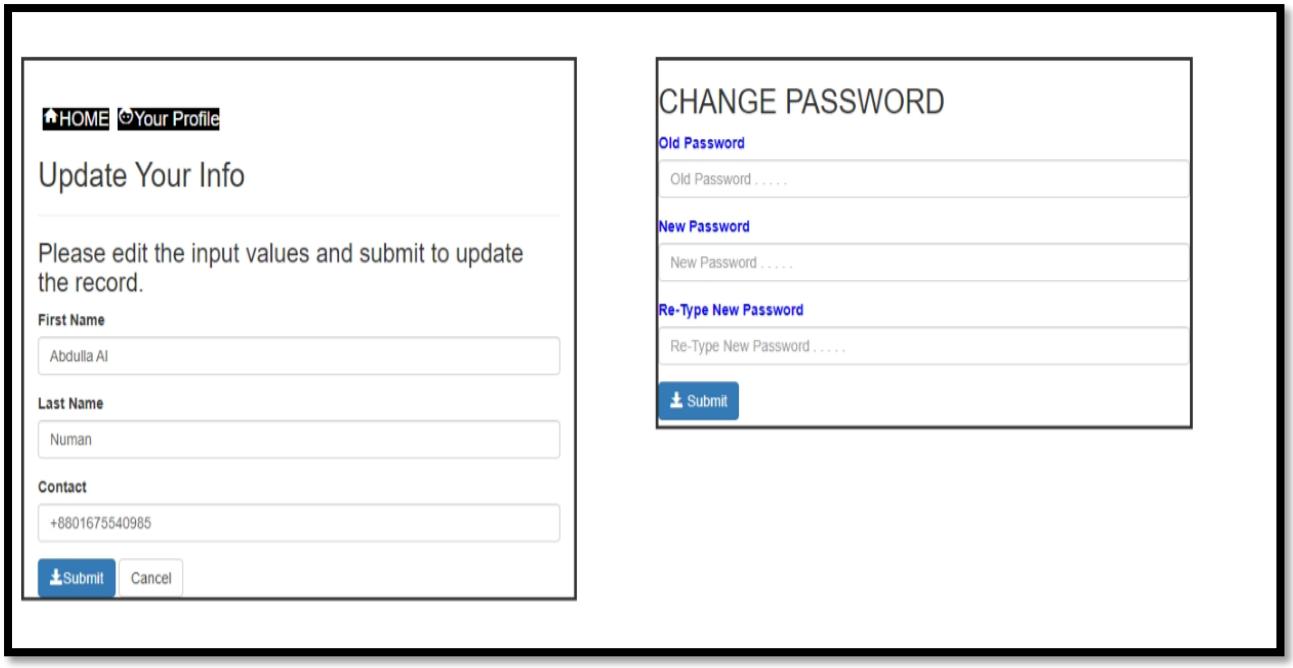

Fig 16:Edit info and change password page

Fig 16 is edit info page screenshot where two separate sections for editing info and changing password

5.9 CV Upload: This page is vital for job seekers. here they can upload three CV and can send anyone to the employer at the time of job application.

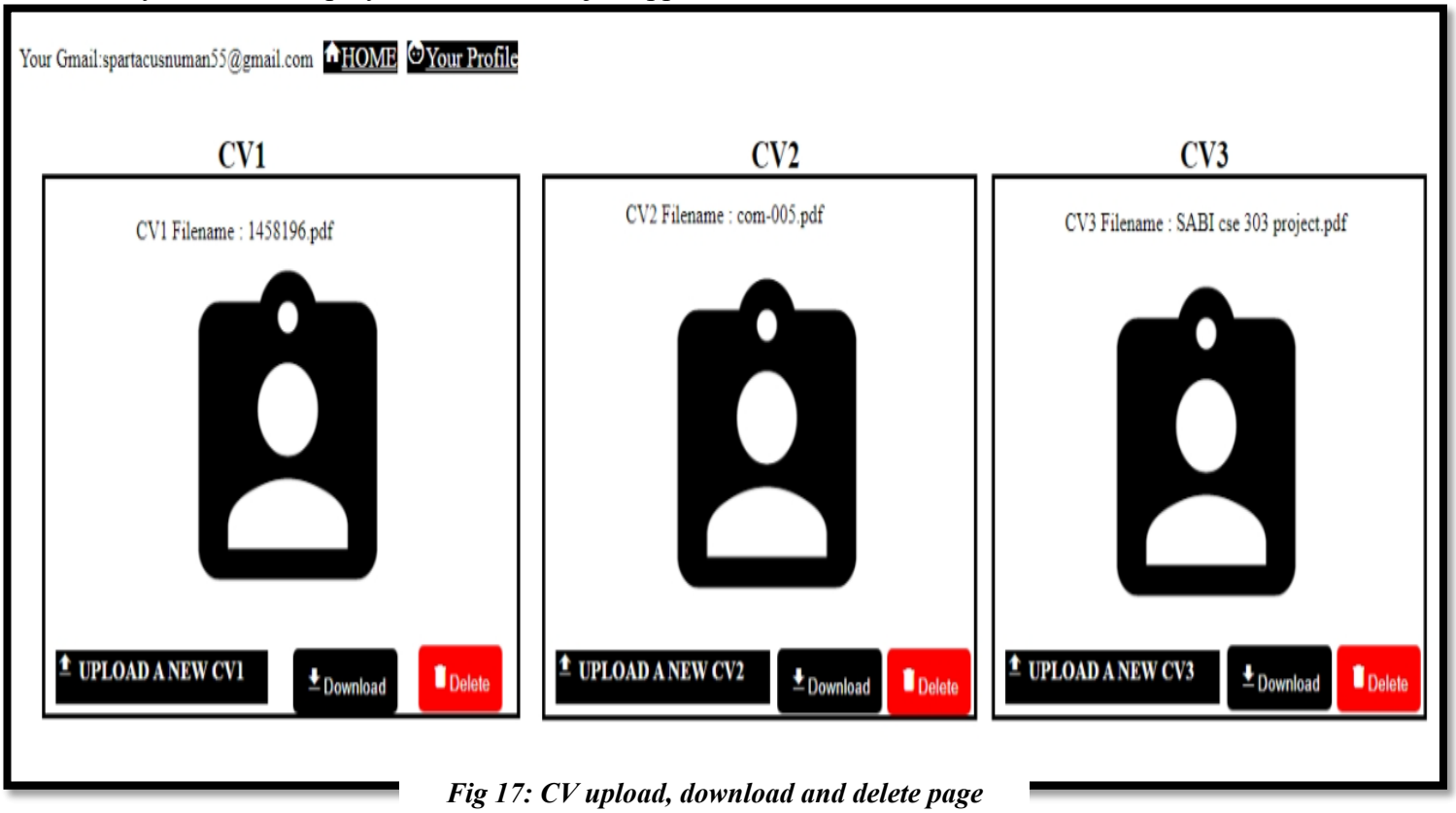

Fig 17: CV upload, download and delete page

Fig 17 has three slots for upload three different CV, each slot has induvial on click options to view CV in new tab as well as can download.

5.10 Post Job: This page is for employers to post job vacancies by submitting the form properly as well as can explore previous job posts.

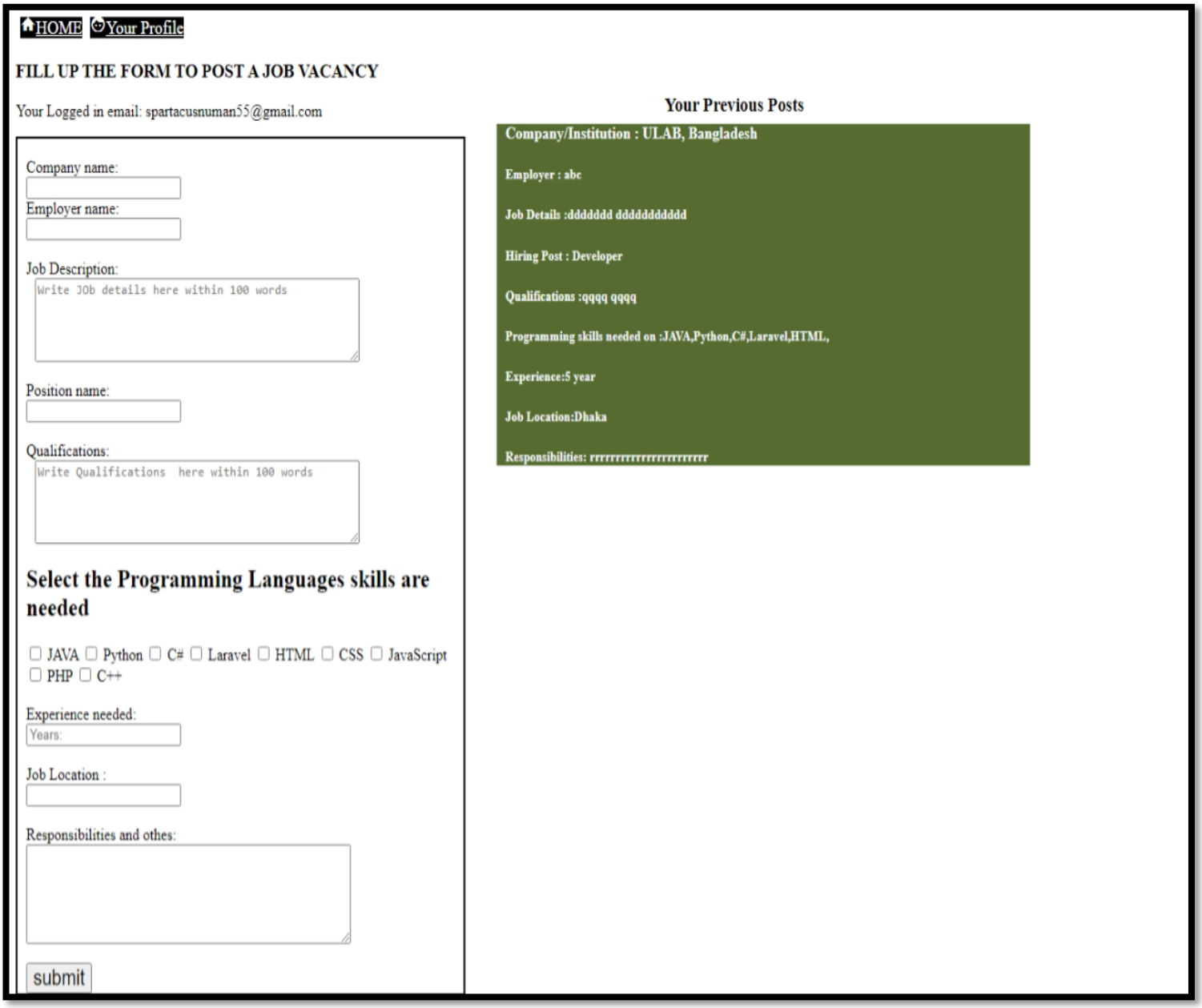

Fig 18: Job Post Page

Fig 18 is displaying a screenshot of job post page where is a form to post job vacancies and in right side displaying old job posts are did by a user(employer).

5.11 Apply Job: Here a job seeker comes when they clicks apply button of any job posts. This page facilitates users to send an email directly to the employer along attaching one of the CV they uploaded in CV upload page.

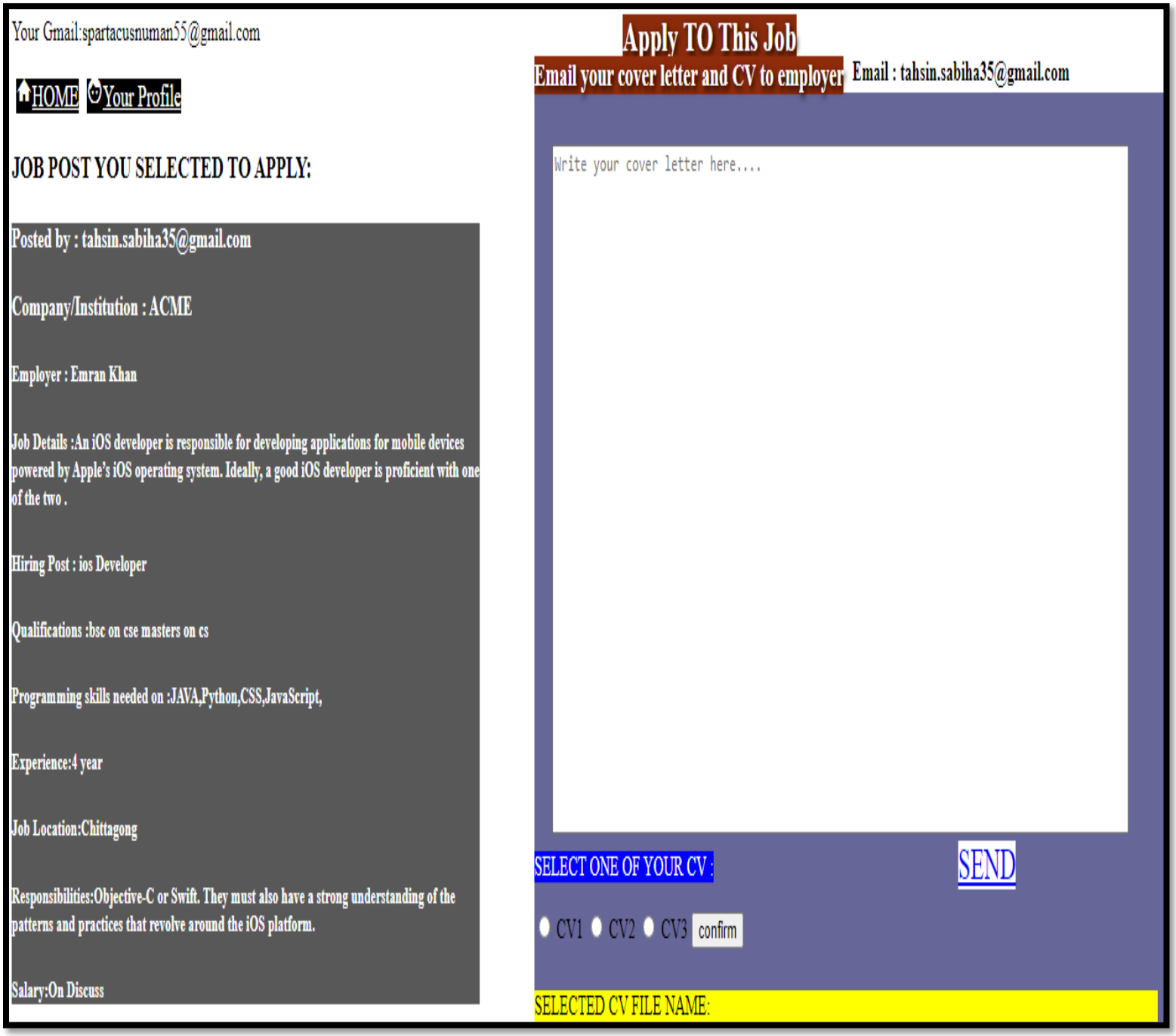

Fig 19:: Apply Job Page

Fig 19 is displaying the apply job segment where in left side viewing the elected job post and in right side a text area to write cover letter and attach CV for sending job application to posted employers' email.

5.12 Discussion forum: This discussion forum is contributed to the interactive policy of this web application job portal their users can post any kind of query and also can comment on others query.

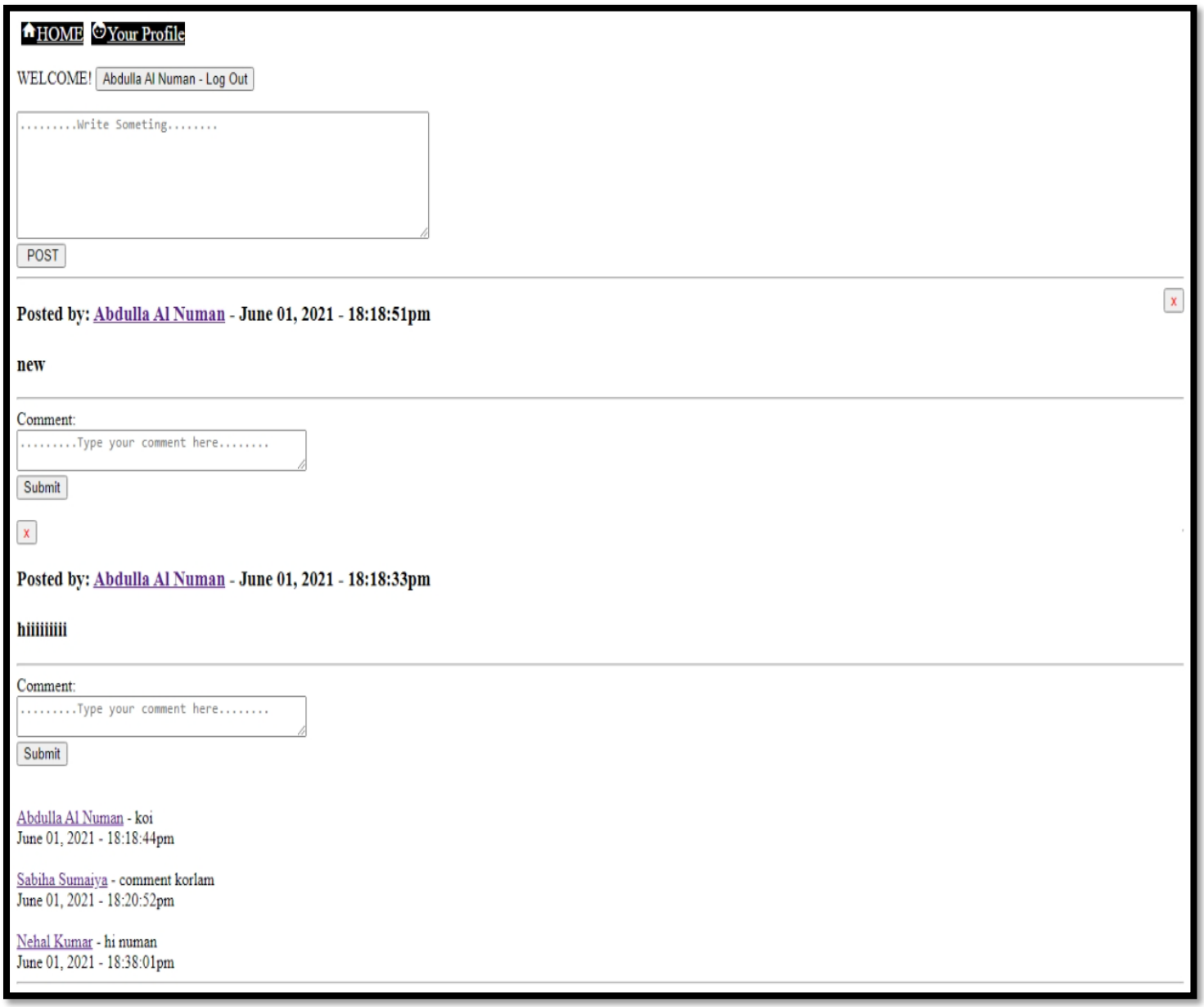

Fig 20:: Discussion Forum Page

Fig 20 is the discussion forum part where a posting option is at the top and displaying all the earlier posts along users' names and their comments with time and date mentioning.

6. Testing and Analysis

Testing is an essential stage of a developing where creators execute a program locally with the intent of discover bugs that resists application from providing the anticipated performance. Nonetheless of the development method, the ultimate aim of testing to ensure that everything has been created according to plan. Likewise, for assuring quality and sustainability of any work testing is highly significant. In my development process testing is considered as an essential part. As well as, I emphasized on the designing of test cases with highest possibilities to figure out faults or bugs.

Several levels of testing are as follows.

6.1 Test Cases:

Test case refers to the bunch of instructions and conditions to confirming either a system is working according to the requirements or not.

I have planned and implemented a few test cases to ensure that my portal is meeting functional requirements.

Below are the test cases for the JOB4CS web application.

TEST MODULE	TEST CASE	EXPECTED RESULT	TEST RESULT
USER	Provide details for signup	Users successfully registered	PASS
USERS	Providing invalid email or password is not matching with confirm password	Displays error message like invalid email or password does not match	PASS
USER	Upon successful login upload profile photo	Users uploads profile photo and saves	PASS
USER	Edit personal info's and change password	Users edits and saves info's properly and after changing password asks to log in	PASS
USER	Users forget password and updates new password	Users updates password by email authentication and logs in with new password	PASS
USERS	Posts queries and comments in others queries	Posts are published in timeline with users name and time-date as well as showing comments belong to that post	PASS

Table 7: Unit Testing

Table 7 is the chart of tests cases, expected outcomes and achieved results regarding all users related functions.

Test Objectives: If a user is job seeker, is he/she uploading CV and applying job properly

TEST MODULE	TEST CASE	EXPECTED RESULT	TEST RESULT
JOBSEEKER	Uploads CV, changes CV, Deletes CV	No cv uploaded if did not save or uploaded any CV file, other else displays the uploaded file's name	PASS
JOBSEEKER	Get suggested job by checking programming language names box	Displays desired job posts asked for marked programming skills	PASS
JOBSEEKER	Applying job by sending cover letter and CV via email to employer	Email sent to employer promptly with attached CV file	PASS

Table 8:Testing data of Job seekers

Table 8 is the recording of job candidates' associated activities testing results like CV uploading or attaching, job application sending etc.

Test Objectives: If a user is employer, is he/she posting job vacancies properly

TEST MODULE	TEST CASE	EXPECTED RESULT	TEST RESULT
EMPLOYEER	Employer fills up job posts form and submits	Job posts published and added in home page job posts tab besides in the employers' job posts list	PASS
EMPLOYEER	Employer gets job application	Employer receives email consists cover letter with CV	PASS
EMPLOYEER	Employer deletes job posts	Job post deletes from database as well as removes from homepage	PASS

Table 9:Test Data of employers

Table 9 is associated to recording the testing results of features are conducted from employers' end like job posting, get applications email, updating job posts.

7. Conclusion and Future Scopes

7.1 Future Scopes:

A job portal has lots of scopes to upgrade its quality, designing and features time to time. In case of JOB4CS their number of segments to improve and add more options for users. Such as, conducting programming language tutorials, CV building courses and programming skill tests can be included for the wellbeing of job seekers. Also, sending new job posts email to job seekers according to their preferred category will be a nice addition. Considering, the swelling popularity of smartphones an Android app can be developed for the benefits of all kinds of device users. Lastly, a number of opportunities are here to upgrade the beautification of web pages through including bootstrap and CSS components.

7.2 Conclusion:

We know that job portals are results of internet evolution and individual field focused job portal like JOB4CS will add a new dimension to this as well as might be a tiny approach to set a new trend for transforming online job market into individual communities thus users can utilize it flexibly than orthodox job portals. Lastly, working in this project developed my knowledge and accuracy regarding web and server-based tasks as well as encouraged my enthusiasm to work more in web application related projects.

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