VISVESVARAYA TECHNOLOGICAL UNIVERSITY

JNANA SANGAMA, BELAGAVI – 590 018

A Mini Project Report on

PLACEMENT MANAGER

Submitted in partial fulfillment of the requirements as a part of the *WEB TECHNOLOGY LABORATORY WITH MINI PROJECT* for the VII Semester of degree of **Bachelor of Engineering in Information Science and Engineering** of Visvesvaraya Technological University, Belagavi

by

Shreyas D L
1RN16IS098

Tejas D S
1RN16IS113

Under the guidance of

Faculty Incharge
Mrs. Hema N
Assistant Professor
Dept. of ISE, RNSIT

Lab Incharge
Mr. Santhosh Kumar
Assistant Professor
Dept. of ISE, RNSIT

Department of Information Science and Engineering

RNS Institute of Technology
Dr. Vishnuvaradhan Road, Rajarajeshwari Nagar post,
Channasandra, Bengaluru-560098

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RNS INSTITUTE OF TECHNOLOGY

Dr. Vishnuvaradhan Road, Rajarajeshwari Nagar post,
Channasandra, Bengaluru - 560098

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the mini project report entitled ***PLACEMENT MANAGER*** has been successfully completed by ***SHREYAS D L*** bearing USN **1RN16IS098** and ***TEJAS D S*** bearing USN **1RN16IS113** presently VII semester students of **RNS Institute of Technology, Bengaluru** in partial fulfillment of the requirements as a part of Web Technology Laboratory for the award of degree **Bachelor of Engineering in Information Science and Engineering** of **Visvesvaraya Technological University, Belagavi** during academic year 2019-2020. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The mini project report has been approved as it satisfies the academic requirements as a part of Web Technology Laboratory with Mini Project for the said degree.

Mrs. Hema N Faculty Incharge Department of ISE RNSIT	**Mr. Santhosh Kumar** Lab incharge Department of ISE RNSIT	**Dr. M V Sudhamani** Professor and HoD Department of ISE RNSIT

External Viva

Name of the Examiners	**Signature with Date**
1. _____	**1.** _____
2. _____	**2.** _____

ABSTRACT

The responsive Placement Management website is a simple and dynamic web for managing the college placement activities. With the help of this website, users can easily plan and prepare for upcoming drives. Users can easily view the drives that are going to happen and also the pre-requisites for these companies. Here users can also apply for any drive provided they satisfy the eligibility criteria. The Placement Manager is developed as an attempt to take a record of company and students. The application provides the facility of viewing both the personal and academic information of the student and company.

The application can also search for eligible students and company and also insertion of new companies by the administrator. Students who create a new account will receive an email asking to verify their account. The key feature of this mini project is that it is a onetime registration. The application provides the facility of maintaining the details of the students. It also provides a requested list of candidates to recruit the students based on given query. Administrator logging in may also search any information put up by the students. This mini project will aid colleges to practice full IT deployment. It will also help in fast access procedures in placement related activities.

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SHREYAS D L USN: 1RN16IS098

TEJAS D S USN: 1RN16IS11

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ABBREVIATIONS

CSS	Cascading style sheets
DBMS	Database Management System
GUI	Graphical User Interface
HTML	Hypertext Markup Language
NoSQL	Structured Query Language
JSON	Java Script Object Notation

Chapter 1

INTRODUCTION

The Placement Manager is a web-based application that provides a user-friendly, interactive interface based on CSS, JavaScript and HTML5 elements. All data is stored in a NoSQL database. The application uses Flask as an interface between front end and back end database.

1.1 Background

The main motivation behind the selection of this mini project was to design, develop and implement a software application which will be useful for the users to get all the information about all activities that happen during placements in the college. Further, to make the application user interface interactive and user-friendly at the same time using Web technologies like PHP, CSS, JavaScript and HTML was challenging.

1.2 About the Mini Project

The responsive Placement Management website is a simple and dynamic web for managing the college placement activities. With the help of this website, users can easily plan and prepare for upcoming drives. Users can easily view the drives that are going to happen and also the pre-requisites for these companies. Here users can also apply for any drive provided they satisfy the eligibility criteria.

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The key feature of this mini project is that it is a onetime registration. The application provides the facility of maintaining the details of the students. It also provides a requested list of candidates to recruit the students based on given query. Administrator logging in may also search any information put up by the students. This mini project will aid colleges to practice full IT deployment. It will also help in fast access procedures in placement related activities.

Chapter 2

REQUIREMENT SPECIFICATION

A Software Requirements Specification (SRS) is a description of a software system to be developed. It lays out functional and non-functional requirements and may include a set of use cases that describe user interactions that the software must provide.

2.1 Hardware requirements

The set of physical computer resources, also known as hardware required for the optimal functioning of an application is known as hardware requirements.

- 32 or 64-bit CPU
- 4-8 GB Memory
- 2-4 GB RAM

Most software defines two sets of system requirements: minimum and recommended. With increasing demand for higher processing power and resources in newer versions of software, system requirements tend to increase over time.

2.2 Software requirements

The requirements are derived throughout the software development process. Software requirements deal with defining software resource requirements and prerequisites that need to be installed on a computer to provide optimal functioning of an application

- OS
- Flask Package
- CSS
- HTML5
- JavaScript
- Firebase

2.3 Functional and Non-Functional requirements

A Functional Requirement defines a function of a system or its component, where a function is described as a specification of behavior between outputs and inputs. A Non-Functional Requirement is a requirement that specifies criteria that can be used to judge the operation of a

system, rather than specific behaviors. The plan for implementing non-functional requirements is detailed in the system architecture, because they are usually architecturally significant requirements.

2.3.1 Functional requirements

The application is open for all the authenticated users and where the user can see the list of companies and its eligibility criteria.

2.3.2 Security requirements

It is of utmost importance to ensure that there is protection against unauthorized access. The user will have a password through which he can log in. Only the person who has access to use can view and apply for placement drives.

2.3.3 Performance requirements

The PCs used must be at least be INTEL CORE i3 machines so that they can give optimum performance. In addition to these requirements, the system should also embrace the following requirements:

- Reliability: The system should have little or no downtime.
- Ease of Use: The application interface should be easy to use and intuitive.

2.3.4 Design and Interface requirements

The designers must design the database is such a way that any change in the information of a client should be updated and saved effectively in the database. The user will have a password and through which he can log in. Only the person who has access to use can view and apply for placement drives. The database designed should be very easy to use and user friendly. Communication between the NoSQL database and front-end is through Flask.

Chapter 3

ANALYSIS AND DESIGN OF THE SYSTEM

System analysis is a problem-solving technique that breaks down a system into its component pieces for the purpose of studying how well those component parts work and interact to accomplish their purpose.

3.1 Analysis of the system

The responsive Placement Management website is a simple and dynamic web for managing the college placement activities. With the help of this website, users can easily plan and prepare for upcoming drives. Users can easily view the drives that are going to happen and also the pre-requisites for these companies. Here users can also apply for any drive provided they satisfy the eligibility criteria.

The Placement Manager is developed as an attempt to take a record of company and students. The application provides the facility of viewing both the personal and academic information of the student and company. It can also search for eligible students and company and also insertion of new companies by the administrator. Students who create a new account will receive an email asking to verify their account.

3.2 Design of the system

System design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. It is the application of systems theory to product development. There is some overlap with system analysis, system architecture and system engineering. If the broader topic of product development "blends the perspective of marketing, design, and manufacturing into a single approach to product development," then design is the act of taking the marketing information and creating the design of the product to be manufactured. Systems design is therefore the process of defining and developing systems to satisfy specified requirements of the user.

3.2.1 Architecture of the system

A Data Flow Diagram (DFD) is a graphical representation of the "flow" of data through an information system, modelling its process aspects. A DFD is often used as a preliminary step to

create an overview of the system without going into great detail, which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design).

A DFD shows what kind of information will be input to and output from the system, how the data will advance through the system, and where the data will be stored. It does not show information about process timing or whether processes will operate in sequence or in parallel, unlike a traditional structured flowchart which focuses on control flow, or a UML activity workflow diagram, which presents both control and data flows as a unified model.

Figure 3.1 shows the data flow diagram for the Placement Manager. It illustrates the flow of data from user and the database. Example, the user first registers by filling the registration form. The user then proceeds to view companies and then apply for drives that he is eligible for.

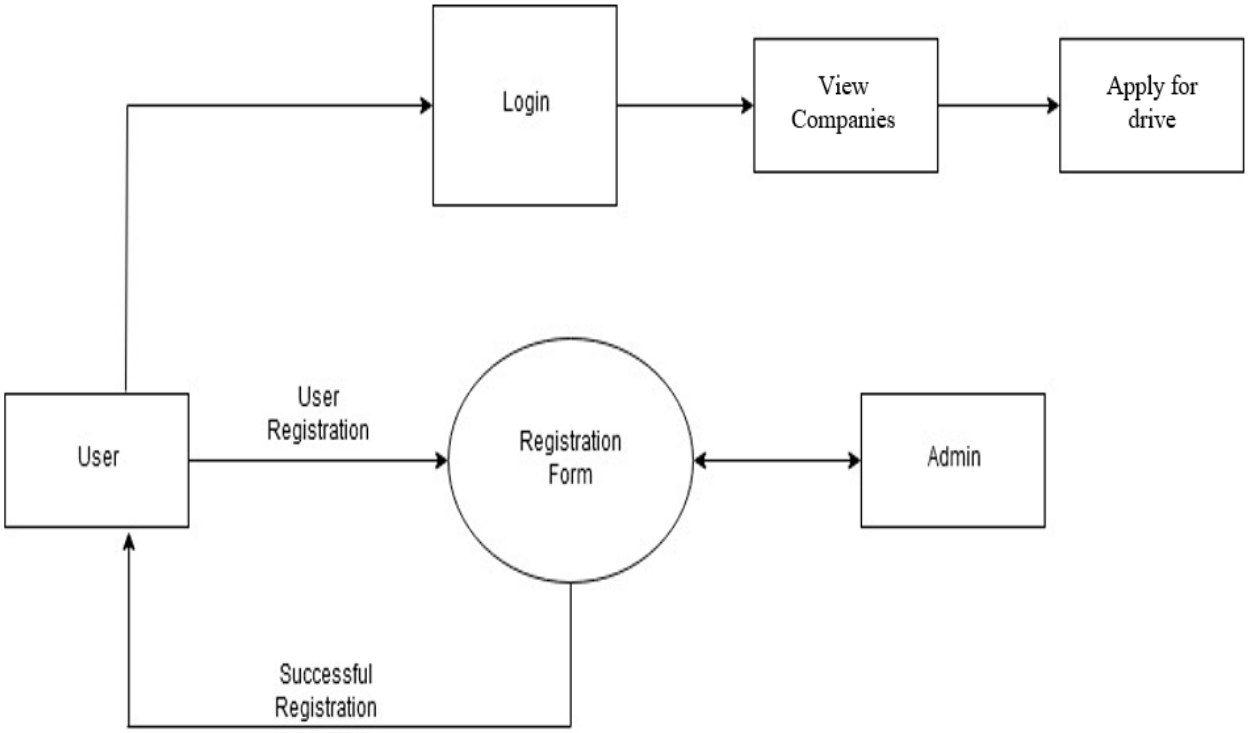

Figure 3.1 System Data Flow Diagram

3.2.2 Use-Case Diagram

A Use-Case Diagram (UCD) at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use-cases in which the user is involved. A use-case diagram can identify the different types of users of a system and the different use-cases and will often be accompanied by other types of diagrams as well. While a use case itself might drill into a lot of detail about every possibility, a use-case diagram can help provide a higher-

level view of the system. It has been said before that "Use case diagrams are the blueprints for your system". They provide the simplified and graphical representation of what the system must actually do.

Figure 3.2 shows the use-case diagram for the Placement Manager. It illustrates the different actions that can be performed by students and administrator in order to interact with the application. Students can go through the list of companies and apply based on their eligibility. Admin can view the list of registered students and also add new companies.

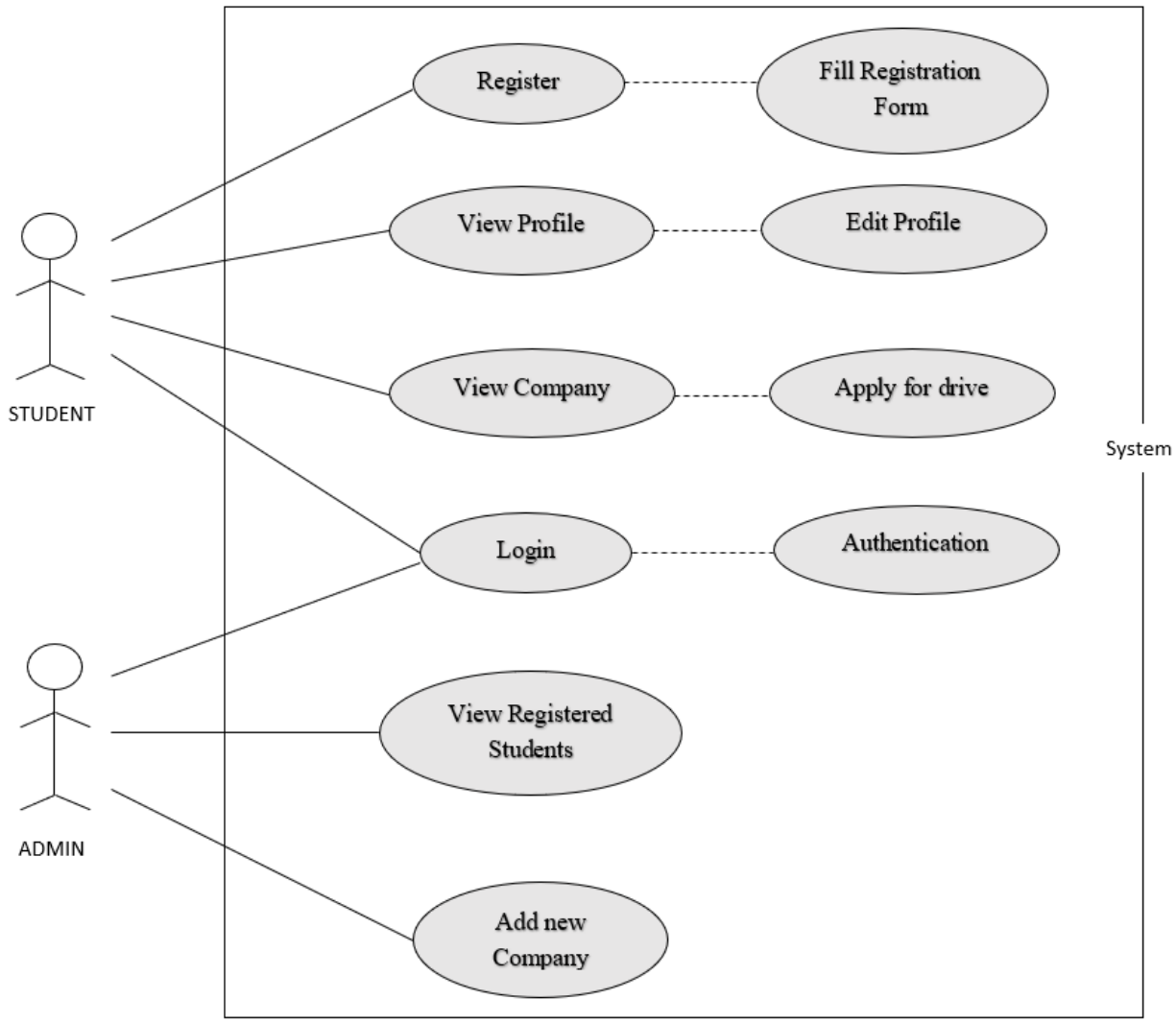

Figure 3.2 System Use-Case Diagram

Chapter 4

IMPLEMENTATION

Implementation is the process of defining how the system should be built, ensuring that it is operational and meets quality standards. It is a systematic and structured approach for effectively integrating a software-based service or component into the requirements of end users.

4.1 Front-end and Back-end used

The front-end is everything involved with what the user sees. The back-end, or the "server-side", is basically how the site works, updates and changes. This refers to everything the user can't see in the browser, like databases and servers.

4.1.1 Features of front-end

The practice of converting data to graphical interface for user to view and interact with data through digital interaction using HTML (Hyper Text Markup Language), CSS (Cascading Style Sheets) and JavaScript refers to front-end web development.

- **HTML**

HTML is the backbone of any website development process, without which a web page doesn't exist. Hypertext means that text has links, termed hyperlinks, embedded in it. HTML is used to create electronic documents (called pages) that are displayed on the World Wide Web. Each page contains a series of connections to other pages called hyperlinks. When a user clicks on a word or a phrase that has a hyperlink, it will bring another web-page. A markup language indicates text can be turned into images, tables, links, and other representations. It is the HTML code that provides an overall framework of how the site will look.

- **CSS**

CSS provides the paint, templates, glitter, buttons, tassel, lights, and many other things that can be used to improve the presentation of a web page. CSS is so commonly used that languages have been built to make writing CSS easier. These languages – like Sass and LESS – are also known as CSS precompiles, but they are simply used to write more efficient and manageable CSS code. It allows one to adapt the presentation to different types of devices, such as large screens, small screens, or printers. CSS is independent of HTML and can be used with any XML-based markup language.

- **JavaScript**

JavaScript is an event-based imperative programming language (as opposed to HTML's declarative language model) that is used to transform a static HTML page into a dynamic interface. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities. JavaScript code can use the Document Object Model (DOM), provided by the HTML standard, to manipulate a web page in response to events, like user input.

4.1.2 Features of back-end

Languages used on the server side refer to back-end. Some of the back-end languages are – PHP (Hypertext Preprocessor), Java, .NET, Ruby, Python, Perl, JavaScript (Node JS), ActionScript (Flash Media Server). Usually people who work on the back-end are called programmers or developers. Back-end developers are mostly worried about things like security, structure and content management.

Python is the back-end language used in the development of the Placement Manager web application. Python is an interpreted language which needs Flask package. Therefore, Flask module is installed with Git Bash. Firebase is used as the database to store data used in the application.

- **Flask**

Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions. However, Flask supports extensions that can add application features as if they were implemented in Flask itself. Extensions exist for object-relational mappers, form validation, upload handling, various open authentication technologies and several common framework related tools.

- **Firebase**

Firebase provides a realtime database and backend as a service. The service provides application developers an API that allows application data to be synchronized across clients and stored on Firebase's cloud. The company provides client libraries that enable integration with Android, iOS, JavaScript, Java, Objective-C, Swift and Node.js applications. The database is also accessible through a REST API and bindings for several JavaScript frameworks such

as AngularJS, React, Ember.js and Backbone.js. The REST API uses the Server-Sent Events protocol, which is an API for creating HTTP connections for receiving push notifications from a server.

4.2 Discussion of code segments

This section includes the segments of code used to provide various user functionalities. Code segment, also known as a text segment or simply as text, is a portion of an object file or the corresponding section of the program's virtual address space that contains executable instructions. The term "segment" comes from the memory segment, which is a historical approach to memory management that has been succeeded by paging.

The web server combines the results of the interpreted and executed Python code, which may be any type of data, including images, with the generated web page. Python code may also be executed with a command-line interface (CLI) and can be used to implement standalone graphical applications.

4.2.1 Code segment for signing in

A code segment is shown below for creating the sign in page. The user can enter his details and sign in if the details are correct.

```
<div class="container">
    <div class="col-4">
      <div class="login-dark p-3 my-5 shadow-lg rounded">
        <div class="pt-3">
          <h2 class="text-white ">Sign In</h2>
        </div>
        <form class="mt-4" action="/login" method="post">
          <div class="form-group">
            <input type="email" name="name" minlength=1
              class="form-control form-control-sm bg-light"
              placeholder="Email Id">
          </div>
          <div class="form-group">
            <input type="password" name="password" minlength=8
```

```
                    class="form-control form-control-sm bg-light"
                    placeholder="Password">
                </div>

                <a href="/forgot_password" class="text-warning">Forgot Password?</a>

                <div class="mt-3">
                  <button class="btn btn-sm btn-light col" type="submit">
                    Login
                  </button>
                </div>

                <div class="mt-3">
                  <p class="text-white text-center">
                    Don't have an account?
                    <a href="/register" class="text-warning">Click here to register</a>
                  </p>
                </div>
              </form>
            </div></div>
  </div>
```

4.2.2 Code segment of registration form

A code segment is shown below for creating the registration form. The user can fill the form and press the submit button. These details will be saved in the database.

```
{% extends "adminlogin.html" %}
{% block content %}
<div class="container">
  <form action="/view_companies" >
  <div class="alert alert-primary" role="alert">
    <p><strong>Company Name : {{company_name}} </strong></p>
    <p>Registered Students</p>
```

```
        {% for k,v in st_list.items() %}
           {{k}} : {{v['Name']}}  <br>
         {% endfor %}
      </div>
        <div class="float-right">
          <button type="submit" class="btn btn-primary btn-sm" href="/view_companies"
            name="comp_name" value="{{k}}" >Back</button>
        </div>
      </form>
  </div>
  {% endblock %}
```

4.2.3 Code segment to view companies

A code segment is shown below for viewing list of companies. The user can for drives held by companies if eligibility criteria is satisfied.

```
{% extends "adminlogin.html" %}
{% block content %}
 <div class="container" style="min-height:100% width:80%">
  {% with messages = get_flashed_messages() %}
    {% if messages %}
      {% for message in messages %}
            <div class="alert alert-warning alert-dismissible" role="alert">
            <button type="button" class="close" data-dismiss="alert" aria-label="Close"><span
          aria-  hidden="true">×</span></button>
                 {{message}}
            </div>
          {% endfor %}
    {% endif %}
  {% endwith %}
  </div>
<div class="container">
   {% for k,v in company_details.items() %}
```

```
    <form action="/reg_students" method="post">
    <div class="alert alert-primary" role="alert">
       <p><strong>Company Name : {{k}}</strong></p>
       <p>Min GPA : {{v['Eligibility']['GPA']}} GPA </p>
       <p>BRANCH : {{v['Eligibility']['Branch']}}  </p>
       <div class="float-right">
          <button type="submit" class="btn btn-primary btn-sm" href="/reg_students"
            name="comp_name" value="{{k}}" >Registered Students</button>
       </div>
       <p>JOB ROLE : {{v['Eligibility']['JOB ROLE']}}  </p>
       {% set d =v['Eligibility']['DRIVE DATE'].split('-') %}
       {% set da=d[2]+'-'+d[1]+'-'+d[0] %}
       <p>DRIVE DATE : {{da}}  </p>
    </div></form>
   {% endfor %}
</div>
{% endblock %}
```

Chapter 5

TESTING AND RESULTS

Testing is a process, to evaluate the functionality of a software application with an intent to find whether the developed software met the specified requirements or not and to identify the defects to ensure that the product is defect free in order to produce the quality product.

5.1 Testing

Software testing is conducted to provide stakeholders with information about the quality of the software product or service under test. Software testing can also provide an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation.

5.1.1 Unit Testing

Unit testing is the process of testing each and every unit of the application individually. Unit tests are typically automated tests written and run by software developers to ensure that a section of an application (known as the "unit") meets its design and behaves as intended. The following test case checks to see if the Registration form opens when the button is pressed, as shown in Table 5.1.

Table 5.1 Unit test case for Placement Manager

Sl Number:	**1**
Name of test:	Redirection check
Item / Feature being tested:	Linking pages
Sample Input:	Click on Register button.
Expected output:	Opens Registration form.
Actual output:	Opens Registration form.
Remarks:	Test succeeded

5.1.2 Integration Testing

Integration testing is the phase in software testing in which individual software modules are combined and tested as a group. Integration testing takes as its input modules that have been unit tested, groups them in larger aggregates, applies tests defined in an integration test plan to those

aggregates, and delivers as its output the integrated system ready for system testing The following test case checks to see if the student can successfully apply for drive when he clicks the apply button, as shown in Table 5.2.

Table 5.2 Integration test case for Placement Manager

Sl Number:	**2**
Name of test:	Checking if students can apply for drive.
Item / Feature being tested:	Applying for drive.
Sample Input:	Click on apply button.
Expected output:	Company gets added to list of drives applied by student.
Actual output:	Company gets added to list of drives applied by student.
Remarks:	Test succeeded

5.1.3 System Testing

System testing is testing conducted on a complete integrated system to evaluate the system's compliance with its specified requirements. System testing takes, as its input, all of the integrated components that have passed integration testing. The following test case checks if the registered user's data reflects on the user page to confirm that the entered details are indeed saved. This can be seen in Table 5.3.

Table 5.3 System test case for Placement Manager

Sl Number:	**3**
Name of test:	User registration.
Item / Feature being tested:	User should be able to register after filling the form.
Sample Input:	Fill in the details and click on the button.
Expected output:	User details get registered into the database.
Actual output:	User details get registered into the database.
Remarks:	Test succeeded

5.2 Discussion of results

The outcomes of test results for a variety of user interactions with the application are discussed in the following sections of the chapter.

5.2.1 Sign-in page

Figure 5.1 shows Sign-in page of the Placement Manager website for user. Users can register and login using this page.

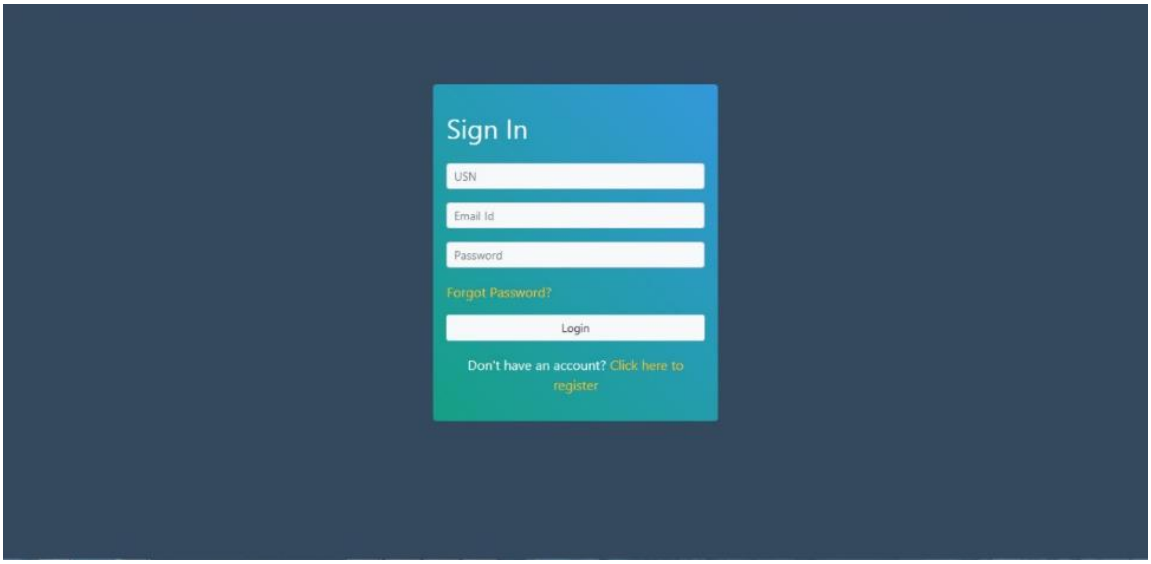

Figure 5.1 Sign-in page

5.2.2 Registration Form

Figure 5.2 shows registration page of the Placement Manager website for user. Users can register by entering all the details asked and pressing the submit button. These details will be stored in the database.

Figure 5.2 Registration Form

5.2.3 Student Details

Figure 5.3 shows Student details page of the Placement Manager website once user enters by signing in as student. Student can view and edit his personal details.

Figure 5.3 Student Details

5.2.4 Companies (Student)

Figure 5.4 shows the view of all companies for student. Students can apply for the drives held by companies by pressing the apply button. If student does not satisfy the eligibility criteria, the apply button is replaced by a non-clickable “Not eligible” button.

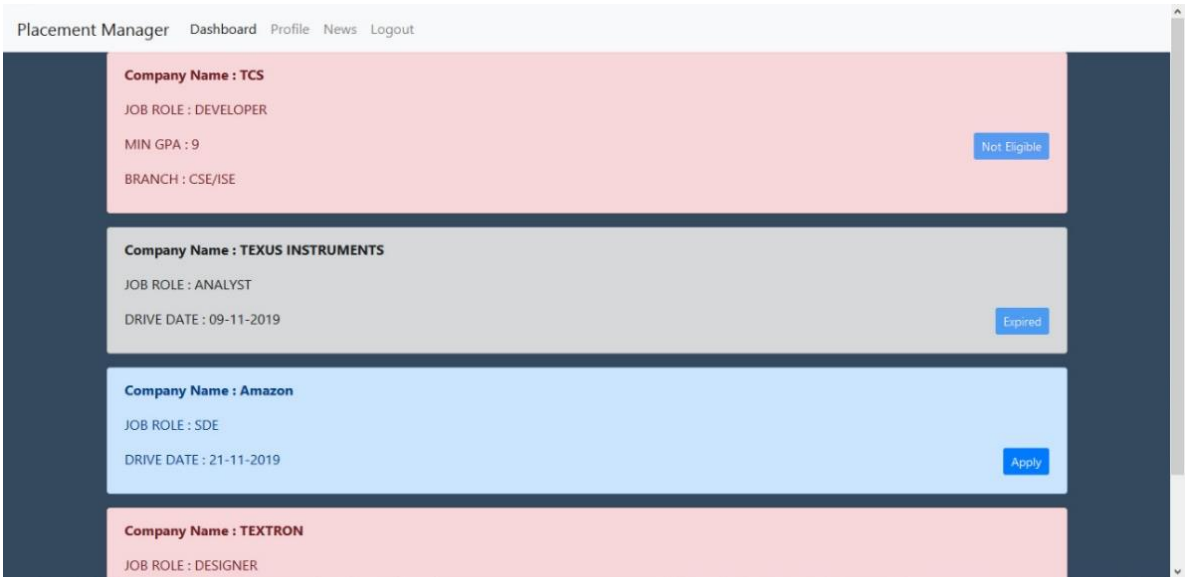

Figure 5.4 Students’ view of companies

5.2.5 Applied Companies

Figure 5.5 shows the list of companies the student has applied for. This page also lets the student upload his resume.

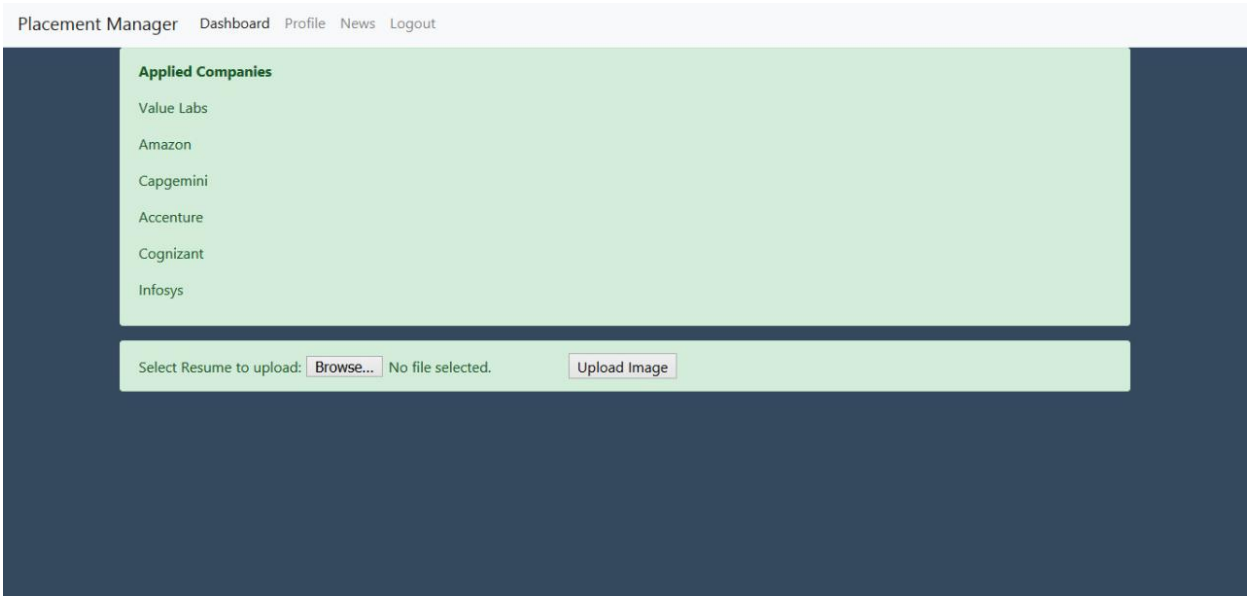

Figure 5.5 Applied Companies

5.2.6 Companies (Admin)

Figure 5.6 shows the view of all companies for student. Additionally, admin can also view the list of all the students that have applied for each company by pressing the "Registered Students" button.

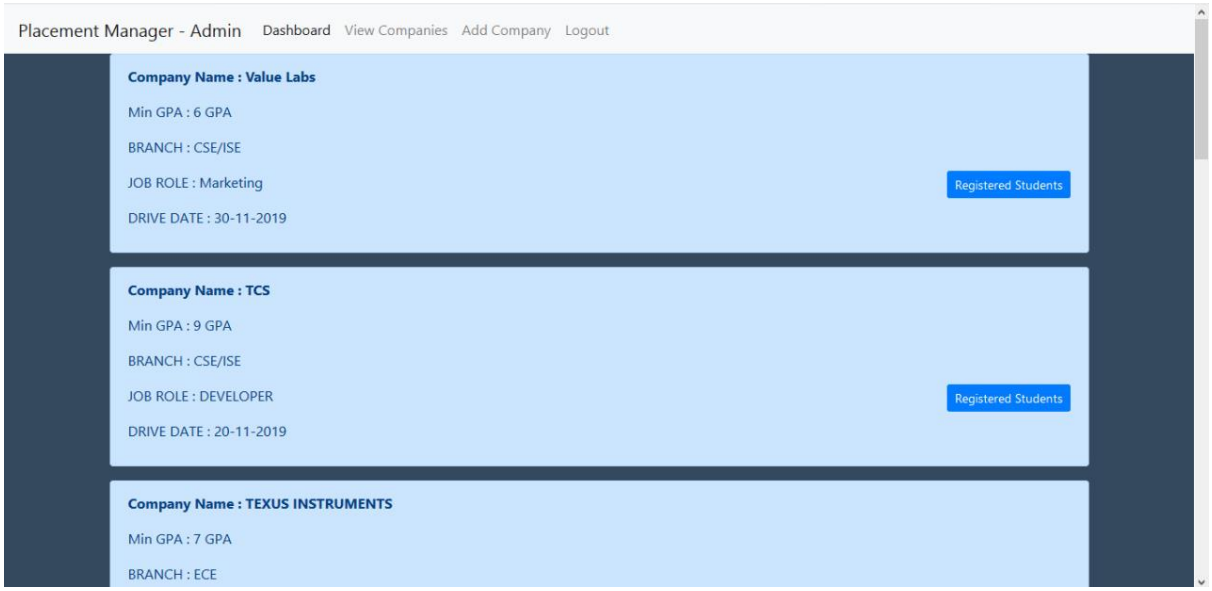

Figure 5.6 Administers' view of companies

5.2.7 Add Company

Figure 5.7 shows the page that allows administrators to add new companies to the database. After adding, students can now apply for the newly added company.

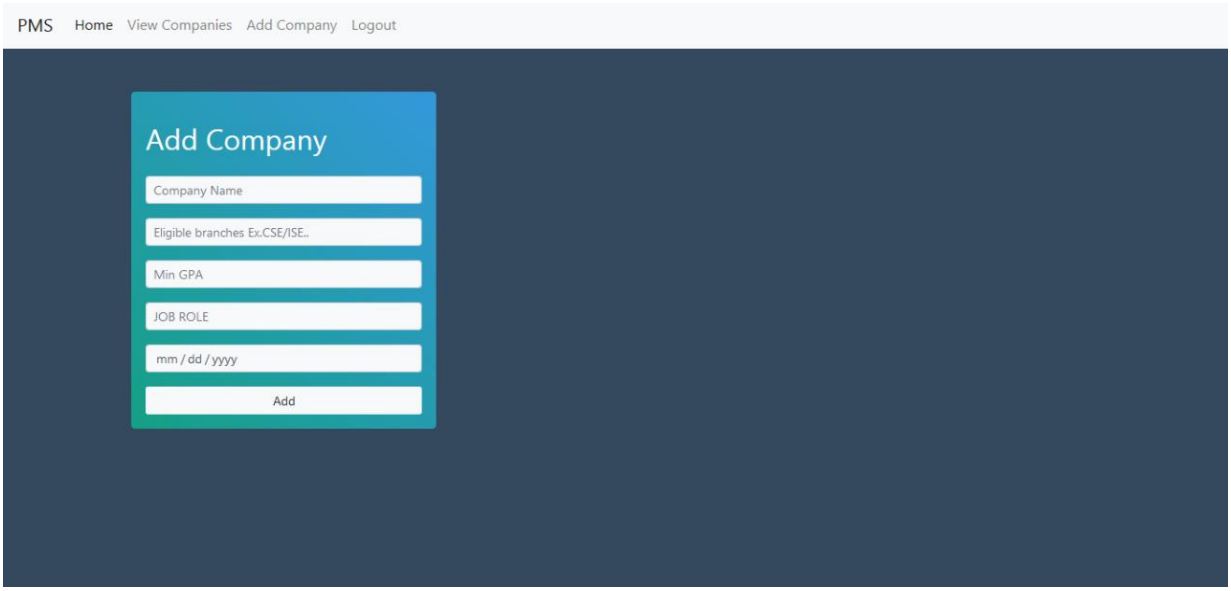

Figure 5.7 Add Company

5.2.8 Database

Figure 5.8 shows the database that contains data in JSON format. It contains the list of all students along with their details and companies along with students who have applied for those companies.

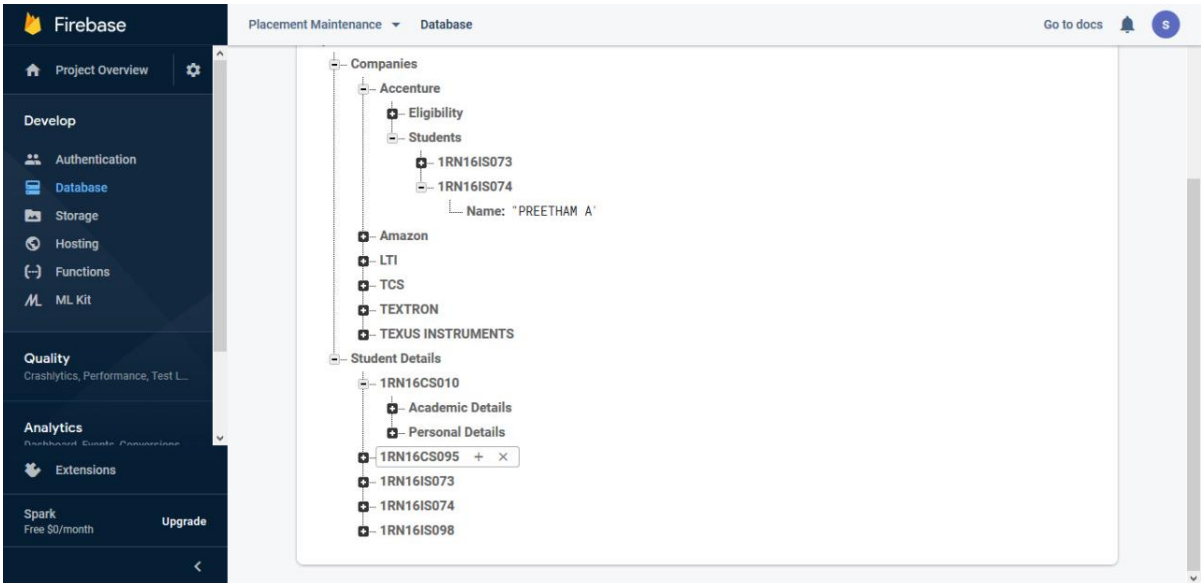

Figure 5.8 Database

Chapter 6

INSTALLATION INSTRUCTIONS

This chapter provides step-by-step instructions to install the FLASK framework required to run Python applications in a Windows environment.

6.1 Installing FLASK framework

- To start the installation process, you need to open the folder where you saved the file, and double-click the installer file. A security warning window will open, asking if you are sure you want to run this file. Click Run to start the installation process.
- Next you will see the Welcome to Python Setup Wizard screen. Click Next to continue the installation.
- The next screen you are presented with is the License Agreement. Read the agreement, check the radio button next to I accept the agreement, then click Next to continue the installation.
- Next you will see the Select Destination Location screen. Unless you would like to install Python on another drive, you should not need to change anything. Click Next to continue.
- The next screen you are presented with is the Select Additional Tasks screen. You will be able to select whether you would like a Quick Launch icon added to the taskbar or a Desktop icon created once installation is complete. Make your selections, then click Next to continue.
- Next you will see the Ready to Install screen. You can review your setup choices, and change any of them by clicking Back to the appropriate screen, if you choose to. Once you have reviewed your choices, click Install to continue.
- After the installation is complete double check to make sure you see python in your PATH. You can find your path by opening your control panel -> System and Security -> System -> Advanced System Settings -> Environment Variables -> Selecting Path -> Edit.
- You need to confirm that C:\Python27 and C:\Python27\Scripts is part of your path.
- As of Python Version 2.7.9 Pip is installed automatically and will be available in your Scripts folder.
- To use Flask, we need to install the packages and to do that we can use pip to install it using the command “pip install Flask”.

Chapter 7

CONCLUSION AND FUTURE ENHANCEMENTS

From a proper analysis of positive points and constraints on the application, it can be safely concluded that the product is a highly efficient GUI based component. This component can be easily plugged in many other systems. Also, the application is user friendly. Generally, the placement officers of the College have to face a lot of problems in management of the Students information. All this information has to be managed manually. So, there is a need to develop a system that can solve the mentioned problem. This software comes with just that solution.

The mini project is itself matured enough but still betterment is always an open door. In this case, we can add some features to this software to make this software more reliable. Firstly, during the development of the project the prime object was to keep the hardware & software requirement as minimum as possible so that it supports maximum user base. Secondly, the searching procedure should be very strong like placement officer can search student as fast as possible. The back-up procedure can be incorporated to make sure of the database integrity. Also, placement officer should be able to contact both student and company through message. Student and company should also be able to send messages to Placement officer.

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