FORWARD FOCUS

System Design Document

04/28/20

Table of Contents

1. Introduction

Forward Focus Career Guidance believes in effectively serving Undergraduate/Graduate students from various streams to realize their true potential and suggests options for their future studies that align with their natural inclinations. Guidance is particularly very important in life. Throughout their lives people face many situations where they could benefit from unbiased advice. The primary difficulty an undergraduate student faces is choosing the best career considering strengths and weaknesses.

The purpose of our system is to develop a platform where students can get guidance, which will help them to make mature and informed decisions. Not only that, we wish to be with students, starting from Profile Evaluation tests until the university selection phase. The students will be analyzed based on their previous scores, Profile Evaluation scores, and Mock Test results. Based on the evaluation and performance (including GPA, and Test score) the system opts to find the best career road map along with providing comprehensive information about admission requirements, for building a good profile and list of universities to that student.

Goals are:-

- ➔ Based on the interests of a student, enrollment is done for a particular category of training and scheduled to give tests.
- ➔ To prepare students for entrance exams like CAT, GRE, GMAT, and TOEFL/IELTS based on their interest fields.
- ➔ To provide outstanding support, training, and feedback oriented evaluation systems to the users to get admission to prime universities.

Forward Focus Overview:-

- ➔ User signup and login facility.
- ➔ Enrollment of students for particular training.
- ➔ A platform that keeps track of schedules and regular examinations.
- ➔ Evaluation system based on performance in examination with feedback to users.
- ➔ Predicting universities based on academic performance and test scores.

Forward Focus emerges as the first online free software where an undergraduate student gets an opportunity not only to prepare themselves for global entrance exams but also gets evaluated based on their performance and helps them to get a better insight regarding their admissions in Universities from different parts of the world.

1.1. Purpose of the System Design Document (SDD)

The System Design Document is essentially constructed to track the necessary and vital information that is required to effectively define the system architecture and design, to be able to productively provide the development team guidance regarding the system details.

System documents and design documents are incrementally and iteratively produced during the complete system development cycle, with respect to the particular circumstances of the project and the system development approach used for developing the system.

The intent of the project is to provide a “one-click” solution and guidance to any Undergraduate/Graduate student looking for upright and honest answers to their confusion. A platform where students can get guidance, helping them make informed and rational decisions. We believe that one’s passion and their field of study can be two different aspects, and therefore we try to learn the real interests of the student and their corresponding field of study, helping them explore their desirable options for Masters abroad.

The proposed solution will have features and functionalities that meet the scope and vision of our project.
Key points that relate to the design and architecture of the proposed system can be given as,
1) Major features that automate operational functions like, Profile Evaluation, Marks Evaluation

2) We believe to have a positive impact on the user community
3) Regional Coordination API Middleware development
The following major functionalities include:
• Automated Personalized Study Plan (Based on the user's respective priorities)
• Complete Scheduling for the Competitive Exams
• Plenty of available mocks giving instant results
• Profile Evaluation
• Web-Based University Selection List (That meets the criteria of the user depending on the preference of a particular Country/State, along with their Course requirements)

1.2. Audience

The audience or users for this system design document include the following:
• Forward Focus Project Management Team
• Forward Focus Database Team
• Forward Focus Web development team
• Internal Consulting Team

1.3. Summary

1.3.1 System Overview

As with websites like careerlever.com that aggregate all the career options for students of different age groups, the long-range vision is for students to understand and explore different career options. Modified concept and the application will include the whole process of establishing two main elements, one for recommendation and the other for a summary of tests. By entering their login ID and password the user would be able to connect with the program and can explore the nuances of the guidance provided. The user will get a recommendation and a description based on the given test. After answered, they will be evaluated on the basis of which the domains will be narrowed and this process will be repeated several times until the final set of questions after which a satisfactory recommendation will be issued. The framework needs to be built to be intuitive, bearable, flexible, cost-effective, and have the foundation to sustain future development. It should also be user-friendly for the students, service providers, and Forward Focus. Forward

Focus is planning to grow an extensive network and may want to extend the network over time. Two key components that will be the focus of our project are the adaptive design and the end result report.

Project goals include:

1. Ability to build student profiles with permission to use multiple access, current eligibility records, university preferences, and other courses that they may participate in.
2. Ability to attend a mock test
3. Ability to evaluate their profile
4. Modular system
5. Information on and ability to schedule test sessions and respective ebook
6. Web-based application, which can be hosted or deployed locally on Forward Focus servers or where Forward Focus prefers
7. Ability to track the record of multiple students at a given time.

The modules and extensions to support the above objectives could include:

- Coordinated monitoring of the Qualifications
- Automated University list suggestions
- Automated test result generation
- Prediction of University Data Analytics
- Career planning and optimization
- Collection of student database
- Includes indigenous factors

1.3.2 Design Constraints

The solution proposed would use the current solution's architecture and system design.

Technical

One big restriction is the development and incorporation of the new software components into the current open-source software framework. It will take different skills and professional understanding of mobility management and demand response management, as well as optimization. That knowledge and skill set are very narrow and very precise. Detailed market criteria and use cases can help reduce the challenge faced.

The proposed program will incorporate multiple features and provide the flexibility to integrate test data into other scheduling and enrolled courses. The coordination feature must allow easy integration and provide published open APIs.

We do not envisage any technological computer equipment, network, internet, or database maintenance problems due to the fact that the application is actually hosted and operated by Forward Focus project team members.

Institutional

Various third party departments and organizations will be using the new program. This will entail region-wide coordination and collaboration. Stakeholders currently running systems like Forward Focus can need to incorporate into the proposed program.

1.3.3 Future Contingencies

To make the Forward Focus software receptive to the personal, cultural, social, and economic needs of the people. It focuses on building the student profile and enhancing effective nuances like:

Expert Advice

- The committee supports and trains entry and competitive examination candidates and solves the respective doubts if any.
- Concentrating on the content of the course and research, and bringing out the best from the person.
- Every student receives personal attention.

Career Counselling

You can't in any way, shape, or form think about all the open doors that exist out there to settle on an educated vocation decision. Additionally, little bits of information are available to your family members, teachers, and companions. Tuning in to them, you'll be pulled in various ways. Maybe what could be directly for them isn't directly for you.

- To begin with, it's tied in with distinguishing your qualities and interests.
- Next, it's tied in with distinguishing a rundown of professional choices where you with your uniqueness will be esteemed.

Levels of Testing

You start at the point that you think is right for you and keep answering the questions until the test finishes and you get a score. You can advance to a higher test score if you get a high mark on one test. If you get a low mark on an assessment you must pass to a lower level assessment.

1.3.4 Document Organization

This project thoroughly defines the framework at the level of the architecture, including subsystems and their facilities, data management, access control, and limit conditions. Each section includes extensive sub-sections that are important for the main section. Tables and graphics were introduced to clarify or illustrate the content.

2. General Overview and Design Overview

2.1. General Overview

The current website has been specifically designed and constructed in an approach to be able to reach out to the maximum audience, i.e. students of different age groups. Helping them understand not only what they want, but also what they could achieve with the right type of guidance. From unlimited resources to personalized study plans, the students don't have to worry about their schedules or their rigorous preparations.
At Forward Focus students receive guidance that complements their construction of knowledge and helps them make informed and enlightened decisions.
Forward Focus is a software that connects students of different age groups from around the world, to encourage them to take the next big step in life. Forward Focus is built on an HTML assisted with a CSS framework, which is then incorporated and associated with the Web Framework of Django. Since Django is an open-source web framework, it is focused on high performance, high concurrency, and low memory usage.
Additional features on top of the web server functionality, like load balancing, caching, access and bandwidth control, and the capability to integrate accurately with precision, with a diverse group of applications, have helped to make Django a good choice for modern website architectures.

Django is amongst the Top 3 web frameworks and is a Python-based free and open-source web framework that follows the model-template-view-architectural pattern.

With this being said, First developed by Tim Berners-Lee in 1990, **HTML** is short for Hypertext Markup Language. Forward Focus developing language is **HTML,** 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.
While **HTML** gives content structure and meaning by defining that content as, for example, headings, paragraphs, or images.

CSS, or Cascading Style Sheets, is a presentation language created to style the appearance of content—using, for example, fonts or colors.

Django is a high-level Python web framework that enables the rapid development of secure and maintainable websites. Built by experienced developers, **Django** takes care of much of the hassle of web development, so you can focus on writing your app without needing to reinvent the wheel.

The Forward Focus database is PostgreSQL. PostgreSQL, also known as Postgres, is a free and open-source relational database management system emphasizing extensibility and SQL compliance. It was originally named POSTGRES, referring to its origins as a successor to the Ingres database developed at the University of California, Berkeley.

In essence, the system design includes the following sub-systems:
• HTML Web Application Pages
• Postgres Database
• Django Web Framework
• CSS Style Sheet Language

2.2. Current

A Statement of Need briefly illustrates and justified as to why this particular system is being developed, what purpose it serves, and why it is necessary.
Forward Focus is designed to meet the unstated but exceedingly crucial and fundamental needs of the students, requiring precise and detailed analysis of all their opportunities and preferences, to set their career on the right path.
Forward Focus boosts their inner confidence, with the right set of questions to help them decide how to move further. It is a journey of a student right after Undergraduation with their minds full of confusion and chaos with crowded information from tons of sources, to a smart and active decision-making for their choice of Career

It:
▪ Provides unified learning experience with accurate planning for the students;
▪ Is tailored to an individuals' schedules and preparation needs along with their personal preferences for their University choice selection; and
▪ Empowers center staff to deliver improved services.

Students and their families are often in need of Counselling services to enable them to learn and work through their favored schedules in alignment with their college classes, be able to learn through essential study material, keep records, and track their own progress. Not only that but with their personal preferences along with the results of the Competitive Examinations, they will receive the Top University List to ponder upon.

Forward Focus enables to target students from all over, to give them a platform to clear their uncertainties and assist them through the confusion.
Our features include:
• Resources in terms of Ebooks
• Detailed structure analysis and understanding of Exam patterns
• Tracking of the user's individual preparations
• Practice Online Quizzes to assess themselves better
• Profile Evaluation, that is based on their current choice of field, their preferred choice of field and their academic performance
• Test Evaluation, which gives them a clear understanding of which stage are they currently performing in
• Personalised University Selection list, based on their preferences and their Examination scores

One-Click provides solutions to every single unattended problem the students have been facing. The features mentioned above are one of the key features of our Web-Application. Forward Focus stores data of each individual user that is constructively used to generate a variety of different outputs that are unique to each user, with their set of preferences along with their Competitive Exam selection from GRE, GMAT, CAT, IELTS, and TOEFL.

2.2.1. Proposed Solution - Statement of Need

The current solution does not provide the assistance of an Expert that will be able to solve the queries generated by any student at the time of solving our questionnaire bank, or resource materials. We also intend to provide a chatbox or helpline service that takes the doubts raised by students at all times and provides the right set of hints and answers.
The solution will be undeniably extended to meet these functional needs of the proposed system, over time. The proposed system will dramatically improve student-expert

coordination, and most importantly, the student experience. With respect to their learning involvement, they will no longer have to look for answers elsewhere. Students will be able to plan and schedule an appointment for their individual concept clarity in real-time, hence boosting their self-confidence. This will create a single coordinated system for Forward Focus enabling them to provide the right guidance for Career Counselling. Ultimately, the proposed system will execute the intended vision and requirements of a "one-click" Career Counselling solution.

2.3 Stakeholder Roles/Responsibilities/Concerns

In general terms, we can say that the term "Stakeholder' refers to the people or groups affected by a software development project. Stakeholders exist both within the organization and outside of it. They may be end users, or they might simply be affected by the process. Either way they have a vested interest in the final product. Input from stakeholders tells the company what kind of software is needed, suggesting ideas for features or problems it needs to solve.

Career guidance programs call for collaboration from multiple stakeholders. It can no longer be simplified and left with one teacher in the school. The following is a breakdown of various stakeholders and ways in which Forward Focus can connect with them.

- **Students:** As we know, students are the primary focus for any Career Counselling Application. The counselor's role is to support students academically and socially. In order to accomplish this, the counselor must know the student body in depth. In order to serve them effectively, you should first seek their input. Sending out the right survey to students, to be able to understand their interests and preferences, we get feedback regarding their strengths and weaknesses.

- **Parents/Guardians:** Career guidance is important for students of all age groups, as they need to make an informed decision about what they choose to do for the rest of their lives. Unfortunately, this is not often the case. The decision is generally made by parents, acquaintances or occasionally teachers and thrust upon students to follow. There is a lack of awareness and availability of professional career guidance for students, parents and educators to encourage students to adopt suitable career options that can bridge passion and ability. There are scientific assessments and expert services to decipher suitable career options.

Thereby, considering the above-mentioned scenario, Parents also hold a crucial part in the decision-making of the Career of their child.

- ➢ **Development Team:** One of the core members that are a part of the Stakeholders, is the Development Committee of the Web Application, making it possible for the students to decipher suitable career options. Not only do they build the Application from scratch, they are also a potential Stakeholder for being the ones using it at the same time. The Development team plays a key role in being the first ones to be able to understand the career counselling and using it.

- ➢ **Expert Services:** Since we already have future designs and arrangements to collaborate with the Expert Services, that will enable the students to raise their respective concerns and doubts in any of the Online Materials and Resources provided. They will be able to book or schedule an appointment according to their difficulties. Additional feature will also include a 24*7 chat feature that will connect Experts and students in order to resolve their queries faster.

2.3.1. Roles

Forward Focus is designed to serve the needs of many different types of users, with features and functions appropriate for each one:

▪ Students are individuals in need of the Career Counselling services. Registered students have a user account and a student profile, while anonymous students who do not have an account can not use the features of the system without logging in.
▪ Family members, or other guardians who assist the students through the process of their journey.
▪ System Administrators are the student service representatives who manage the software and assist the students from providing the right resources to managing their key account details.
▪ Forward Focus Administrators are the representatives of organizations, who perform all the maintenance functions and resolve performance related bugs.

2.3.2. Responsibilities

Development team has been selected to design and build the functionality of the current system. The items below define the roles for the project.

Scrum Master
Scrum Master responsibilities include delivering every project on time within budget and scope.
Responsibilities:
• Coordinate internal resources and third parties/vendors for the flawless execution of projects
• Ensure that all projects are delivered on-time, within scope and within budget
• Developing project scopes and objectives, involving all relevant stakeholders and ensuring technical feasibility
• Ensure resource availability and allocation
• Develop a detailed project plan to track progress
• Establish and maintain relationships with third parties/vendors
• Create and maintain comprehensive project documentation

Product Owner
One of the most important things for the success of scrum is the role of the Product Owner, who serves as an interface between the team and other involved parties (stakeholders).
Responsibilities:

- The product owner is responsible for conveying the vision of the stakeholders to the team.
- They have the authority to alter the scope.
- The Product Owners are responsible for the return on investment (ROI) that is why they occupy an authoritative position in the firm.
- Because they convey the vision of the stakeholders that is why they are the voice of the stakeholders.
- Not only with the team, but they also communicate with the stakeholders about progress and problems.

Scrum Team

In Scrum a team is not just the executive organ that receives its tasks from the project leader, it rather decides self dependent, which requirements or User Stories it can accomplish in one sprint. It constructs the tasks and is responsible for the permutation of those. The Scrum Master does not need to delegate all the work and to plan the project, he rather takes care that the team meets all conditions in order to reach the self-made goals.

Responsibilities:

- The Scrum Team is responsible for all the activities that lead them towards their sprint goals.
- They have to work with the Scrum Master to prioritize the items from the product backlog in the sprint planning.
- Once committed, it is their responsibility to fulfil the commitment and deliver the agreed results on time with great quality.
- The Scrum Master is not responsible for keeping his team organized, that is they it is the duty of the Scrum Team to get self-organized.
- They have to be agile in the office and have to attend every standup and other ceremonies.
- They have to participate in all the meetings despite their nature and have to ensure that all the findings of the meetings are getting practically addressed in the project.

2.4 System Assumptions/Constraints/Dependencies/Risks

2.4.1 System Assumptions

The following are the assumptions taken while developing the system:

- The largest assumption is that the developed Forward Focus web application can be extended while adding proposed new features.
- The system is user friendly.
- All the details are properly stored in the database.
- Users must remember the email he used while registering for our web application.
- Users must enter the correct password for the registered email to use the services.

2.4.2 System Constraints

The following are the system constraints :

- The software is only available in English.
- Guest mode is not available which means that users must be registered to use the services.
- Students have to give mock tests offline, after downloading the test(quick quizzes can be given online).
- Students will have to check their answers from the answer key provided by Forward Focus team and enter marks honestly
- Teaching Experts are not yet considered due to financial constraints.

Other than these no hardware or software technical constraints are identified with this project.

2.4.3 System Dependencies

The web application of Forward Focus is dependent on the following third-party systems:

- All Email providers: For registering into Forward Focus users need to enter a valid email provided by one of the providers, hence this is one of the major dependencies of this web application.
- All verified Content Providers: For mocks and study materials Forward Focus team uses verified and open sources for content.

2.4.4 Risks

- The risk in the web application of Forward Focus is associated with the system design.
- The risk is because of the fact that whether the system design and architecture will be able to accommodate the new features or not.
- Ongoing system maintenance can impose a major risk to the system.

3. Design Consideration

3.1. Goals and Guidelines

The following goals must be addressed for the intricate execution of the proposed solution.

Leverage Existing Architecture

Since there is no existing architecture or system design, the proposed solution will develop and establish a strong infrastructure to be able to steadily provide the specified features, functionality, and use cases. This will try to minimize negative impacts on usability, and user experience.

Development Environment

The development of the application should remain constant and consistent with any extended changes. This will try to reduce the negative impacts on interoperability and the quality of the application. Forward Focus does not wish to rewrite or re-engineer the existing application unless absolutely necessary.

Ease of Use

The features and the entire functionality of the developing application must be easy to use and at the same time provide a strong and reliable user experience. New characteristics cannot impact the existing functionality from a user perspective.

Extensibility

The proposed features must be extendable. Hence, features can be enabled as per the demands and requirements by the users.

3.2. Operational Environment

- HTML Development
- PostgreSQL Database
- Django Web Framework

▪ CSS Stylesheets
Functional goals of the proposed system include:
• Accurate functionality of the web application
• Coordinating data via a database model
• Ability to build student profiles with permission to use multiple access, current eligibility records, university preferences, and other courses that they may participate in.
• Ability to track the record of multiple students at a given time.
• Web-based application, which can be hosted or deployed locally on Forward Focus servers or where Forward Focus prefers
• Improving application performance
• Completing the one-click deployment model

3.3. Development Methods & Contingencies

Security
For Security to be as tight as possible, the architecture should expose only the minimal amount of code possible. Most of the back-end parts should be hidden away.

Extensibility
Here, Extensibility points to the fact that the architecture of the application must be able to swap out modules or pages and be able to add parts of the application to where they are needed, without having to worry about the underlying data contracts in place.

Separation of responsibility
The system of the application that has been developed, should be interchangeable and modular enough that each part of the developed code has a set of responsibilities. Only the set of responsibilities mentioned should be a part of it and no other responsibilities. A very important point includes, that the back-end should not create front end code as well as nor should the front-end code include business logic.

3.4 Architectural Goals and Constraints

Forward Focus offers multiple courses for provisioning admission in top universities and the deployment of knowledge. The deployment software varies from student to student. The overall goal of the system is to provide a highly available and scalable guidance platform.

Mobility
Mobility has radically changed the way corporations do business. Information is available in various apps, with greater precision in real-time than ever before. Together, mobility and the cloud make it easier for students to become successful from anywhere. To meet rigorous university requirements, the electronic devices they use must be safeguarded.

Social
Social media has profoundly affected the way people work. Employees can exchange information with various sources, and accountability in real-time.
You will have to have resources in a non-cloud setting based on a theoretical maximum peak conjecture. This may result in periods of idle expensive resources or in instances of insufficient efficiency.

Scalability
Applications are that over time, and a data management framework needs to evolve with the pace of change to protect the dataset rapidly and efficiently while retaining an economy of scale that continues to produce career value out of the system.

Platform
Comprises tools for software creation, network access, application servers, database management, business service buses, analytics, etc.
As a utility, the existing program uses a network. Below is the service overview.
▪ HTML Development
▪ PostgreSQL Database
▪ Django Web Framework
▪ CSS Stylesheets

Development Environment

Software	Description
PostgreSQL	Database
Django	Programming Framework for UI
CSS	StyleSheets for UI

HTML	Programming Framework for UI

3.5. Performance Engineering

Performance engineers may work as part of a team that aims to solve a specific problem; some people in this profession may work in an office on-site, while others may be able to interact.
Forward Focus provides many design and procurement solutions for relevant assets to reduce future performance issues.

1. Take the time to address problems and concerns that can help to improve productivity.
2. Help the individual students to conquer efficiency barriers.
3. Explore various techniques for coping with everyday challenges.
4. Map a long-term career path that keeps them tuned to the needs of the organization.

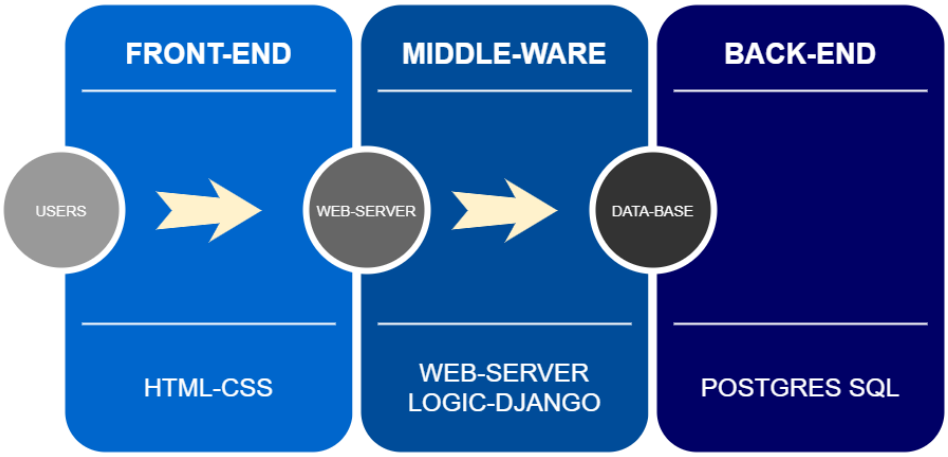
To meet the goal and design of Forward Focus will be based on Python technologies as well as the development guidelines for building Forward Focus software.

4. Systems Architecture and Architecture Design

4.1 Software Architecture

The Forward Focus team has used, the popular three-tier data centred design software architecture , the following are the three tiers of our web-based application:

1) Presentation layer/Front-end: The presentation layer represents the components that users directly interact with Team Forward Focus uses HTML-CSS for designing front-end components.
2) Logic Layer/Middle-ware: The logic layer translates actions at the presentation layer to the functionality that further runs the system. This layer contains code that translates actions. This layer links all web pages together. This layer is the heart of web-application. We have used the Django framework of Python for middleware.
3) Back-end: This layer holds data that is generally required by the web-application, the logic layer generally fetches the data from this layer. We have used PostGre-SQL for storing the database.



4.1.1 Software Elements

FUNCTION	DESCRIPTION
General Access	Users can access the web application from any browser..
Login/Eligibility	Users need to login if they are an existing user, else registration needs to be done to use the services of Forward Focus. Following pages can be accessed without logging in: 1) Home Page 2) About Us page
Career stream suggestion	Users need to fill up all the details required to take benefit of this service.
Examination Details	All the examination dates and details are regularly updated on the website, users can get thorough information of any particular exam.
Career Preparation	Forward Focus team is motivated to provide full support and resources to users for the preparation of the stream they choose.
Mock-Tests	Users can also test themselves by giving mock tests.
University Finder	After Giving Mock-tests users can also enter their mock results and find universities suitable to them,according to their results.

5. Systems Design

The system architecture includes evaluating possible technology approaches and comprehensive computer-based solution specifications. The core concepts are object-oriented design. While the analysis focuses on the logical, independent aspects of a system, the design addresses the physical or implementation-dependent aspects of the system. As we are designing a career guidance program, it's fitting to use a use case diagram in the design. The analysis is used as a guide in system design to develop the interface between the Forward Focus provider and the system's students and users. Structure the program as a top-down progressive system of modules. The module is a gathering of directions: a square, top-down progressive system of modules.The top-down structure of these modules is created as per different plan rules and rules. The organized configuration is viewed as a procedure strategy since its accentuation is on the procedure building obstructs in the vocation direction framework.

5.1. Database Design

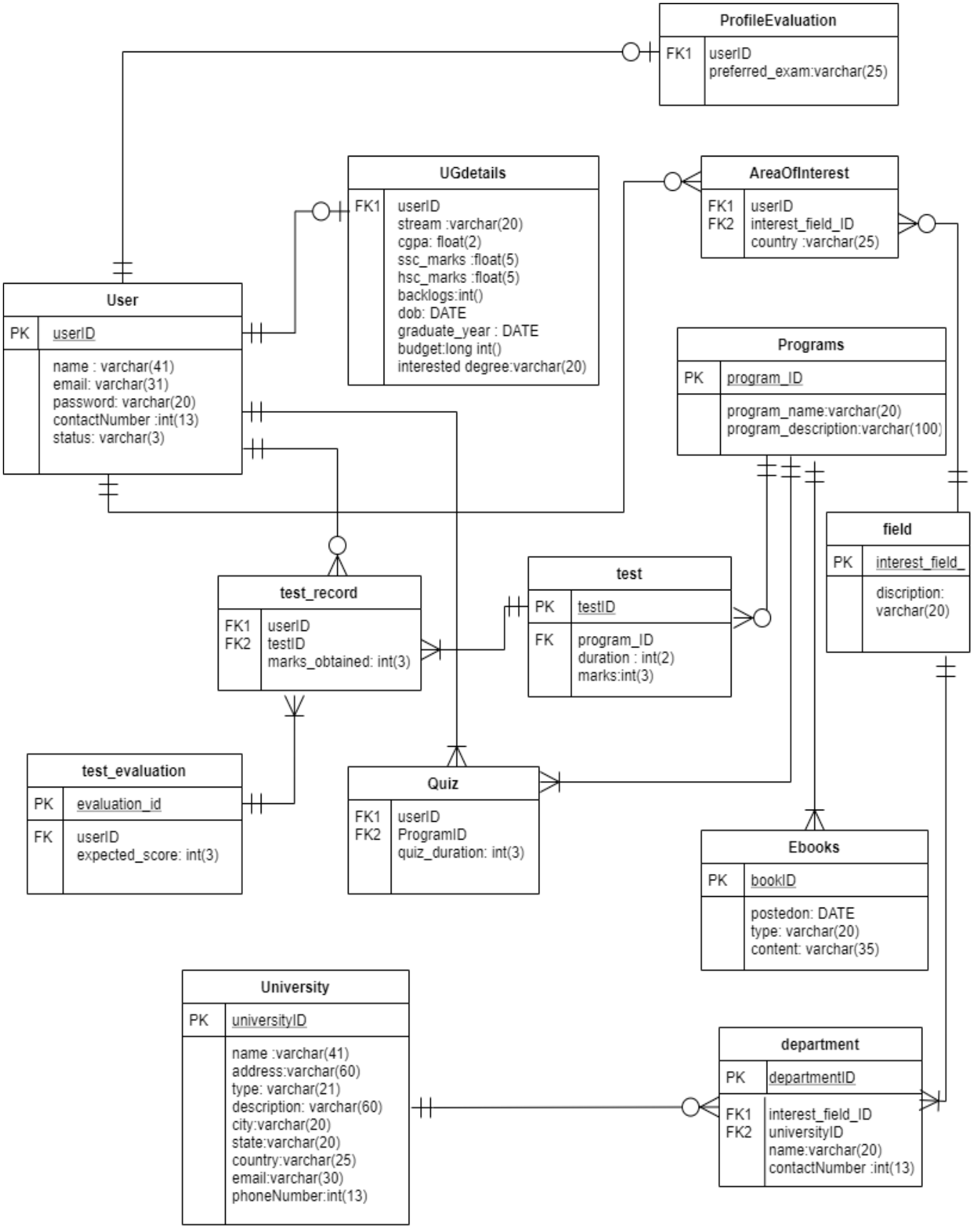
A database management system (DBMS) is a set of programs that allow the creation and maintenance of related data collection. Enable, control, protect, and maintain the data through DBMS and associated programs. A DBMS’s fundamental purpose is to provide a reliable, persistent data storage facility and mechanisms for efficient, convenient access to, and recovery of data. The Forward Focus software designed database is built with the aim of building a database for user information, job details, and operation. Each table in the database consists of a primary key and a foreign key used to link other tables related to it.

5.1.1. Entity Relationship Diagram

We will use the ERD (Entity Relationship Diagram) as our method for designing a database. To produce an easily read, easily organized, and easily expanded database blueprint, the ERD uses symbols to indicate entity sets, relationships, and relationship types.

This explains the relationships that exist between the entities in our E-Career Guidance system as shown in the following;

- (1:N) = > This means that only one or many services can be requested.
- (1:N) = > This means that one or more users will register for Career Guidance.
- (1:1) = > means a customer may enter one user at a time.
- (1:1) = > which means a job in the service


ProfileEvaluation
FK1
userID
preferred_exam:varchar(25)
UGdetails
FK1
userID
stream :varchar(20)
cgpa: float(2)
ssc_marks :float(5)
hsc_marks :float(5)
backlogs:int()
dob: DATE
graduate_year : DATE
budget:long int()
interested degree:varchar(20)
AreaOfInterest
FK1
FK2
userID
interest_field_ID
country :varchar(25)
User
PK
userID
name : varchar(41)
email: varchar(31)
password: varchar(20)
contactNumber :int(13)
status: varchar(3)
Programs
PK
program_ID
program_name:varchar(20)
program_description:varchar(100)
field
PK
interest_field_
discription:
varchar(20)
test_record
FK1
FK2
userID
testID
marks_obtained: int(3)
test
PK
testID
FK
program_ID
duration : int(2)
marks:int(3)
test_evaluation
PK
evaluation_id
FK
userID
expected_score: int(3)
Quiz
FK1
FK2
userID
ProgramID
quiz_duration: int(3)
Ebooks
PK
bookID
postedon: DATE
type: varchar(20)
content: varchar(35)
University
PK
universityID
name :varchar(41)
address:varchar(60)
type: varchar(21)
description: varchar(60)
city:varchar(20)
state:varchar(20)
country:varchar(25)
email:varchar(30)
phoneNumber:int(13)
department
PK
departmentID
FK1
FK2
interest_field_ID
universityID
name:varchar(20)
contactNumber :int(13)

5.2. User Interface Design

A user interface is a device that enables interaction between a person and a machine. The interface design defines how users interact with the Career Guidance system and how the system captures information about users, in order of words. This project has a user interface design due to the degree of contact between the users and site knowledge generated by Forward Focus.

5.2.1. Use Case Object-Oriented Models

The aim of the Use case Object-Oriented Model is to characterize:

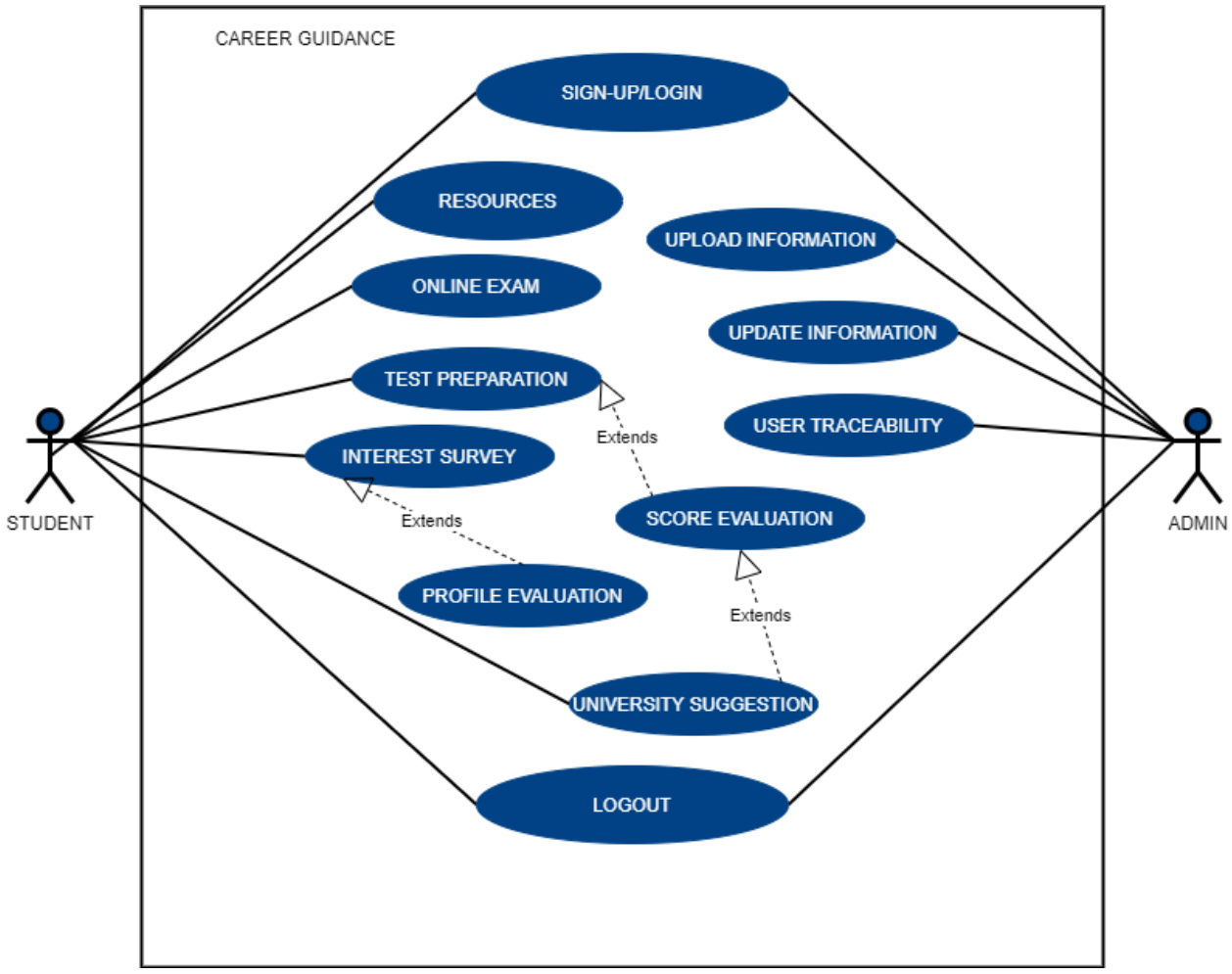
- A set of use cases for our Career Counselling system, Forward Focus.
- The actors (The initiators) which refer to the users and Career Guidance.
- The relations between the actors and the use cases.

Here, we introduce nine Use cases.

- Sign-up/Login
- Interest and Skill Survey
- Upload Information
- Update Information
- User Traceability
- Test Preparations
- Evaluation
- University Suggestions
- Logout

In the below-given figure, the Use Case diagram demonstrates and emphasizes the interaction of the Career Guidance Counselor with the system along with the communication of the users (students of all age groups) with the system. The users and Career Counselors are the actors of the system and the system, in turn, responds to the actors by carrying out certain operations indicated in the UML Diagram.

5.2.2. UML Diagram



5.3. Data Flow Diagram

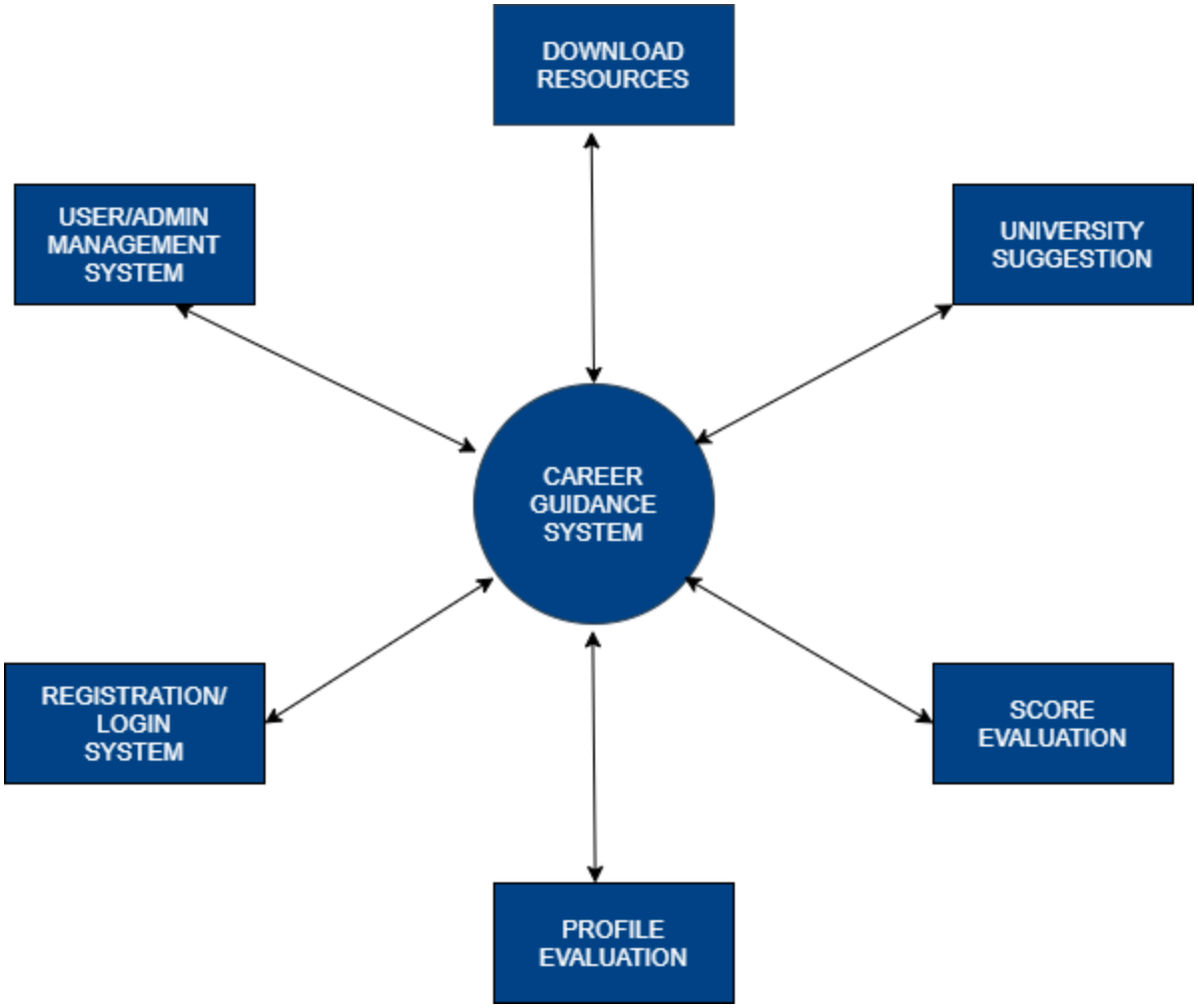
Data flow diagrams visually represent systems and processes that would be hard to describe in a chunk of text. Forward Focus Data Flow Diagram is often used as a preliminary step to create an overview for Career Guidance without going into great detail which can later be elaborated. It normally consists of overall application dataflow and processes of Career Guidance. It contains all the user flow and their entities such as Career Management, Exams Management and Evaluation, Student Database, Exam Database etc. All of the below diagrams have been used for the visualization of data processing and structured design of the Forward Focus and it's working flow.

1) **Level 0**

This is the zero level DFD of Forward Focus system, where we have elaborate the high level processes of the Career Guidance system. It is designed to be an at a glance view of all the processes being analyzed or modelled and can be easily understood by a wide audience.

High level entities and process flow of Forward Focus

- Career Management
- Exams management and Evaluation
- Login Management
- User/Admin Management System

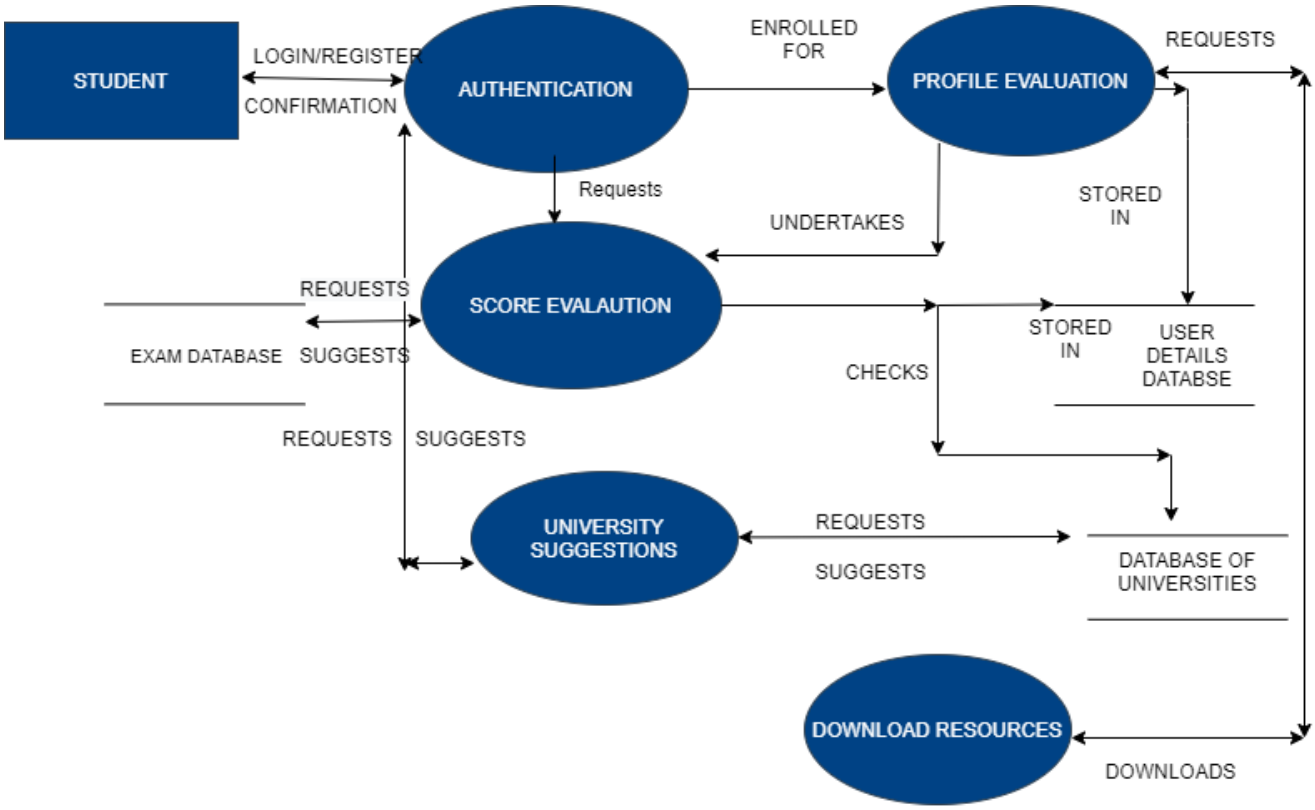


2) Student Side DFD

Student Side DFD shows how the system is divided into subsystems, each of which deals with one or more data flows to or from an external agent, and which together provide all the functionality to a student enrolled in Forward Focus as a whole.

Main entities and Output of Student Side DFD

- Student login/register system
- Enrollment after entry of details
- Storing details in student's database
- Input of student's interests
- Conducting exams and their evaluation
- Study materials
- University Suggestions
- Download Resources

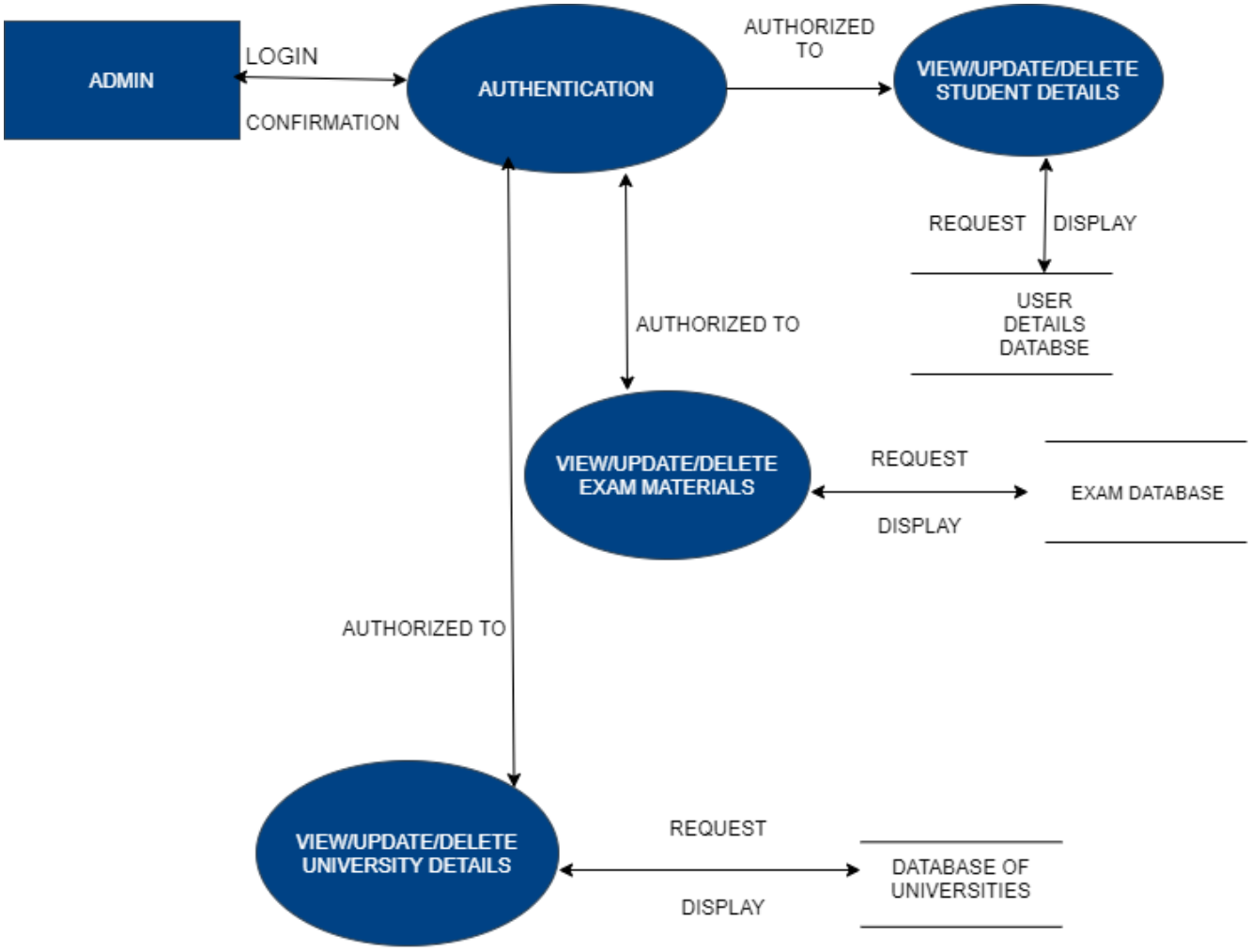


3) Admin Side DFD

Admin side DFD gives an overview of functionalities managed from Admin side in Forward Focus System.

Main entities and Output of Student Side DFD

- Admin logins to the system
- Admin can view details of students enrolled into the system
- Admin can check exams status and view exam results of students
- Admin can update exam materials
- Admin can update University Details



5.4. Activity Diagram

5.4.1. Admin side Activity diagram

The purpose of the activity diagram is to provide an overall view of activities, flows and exactly what is happening inside the use-case among several classes.The activity diagram of the admin side of Forward Focus web application is presented below:

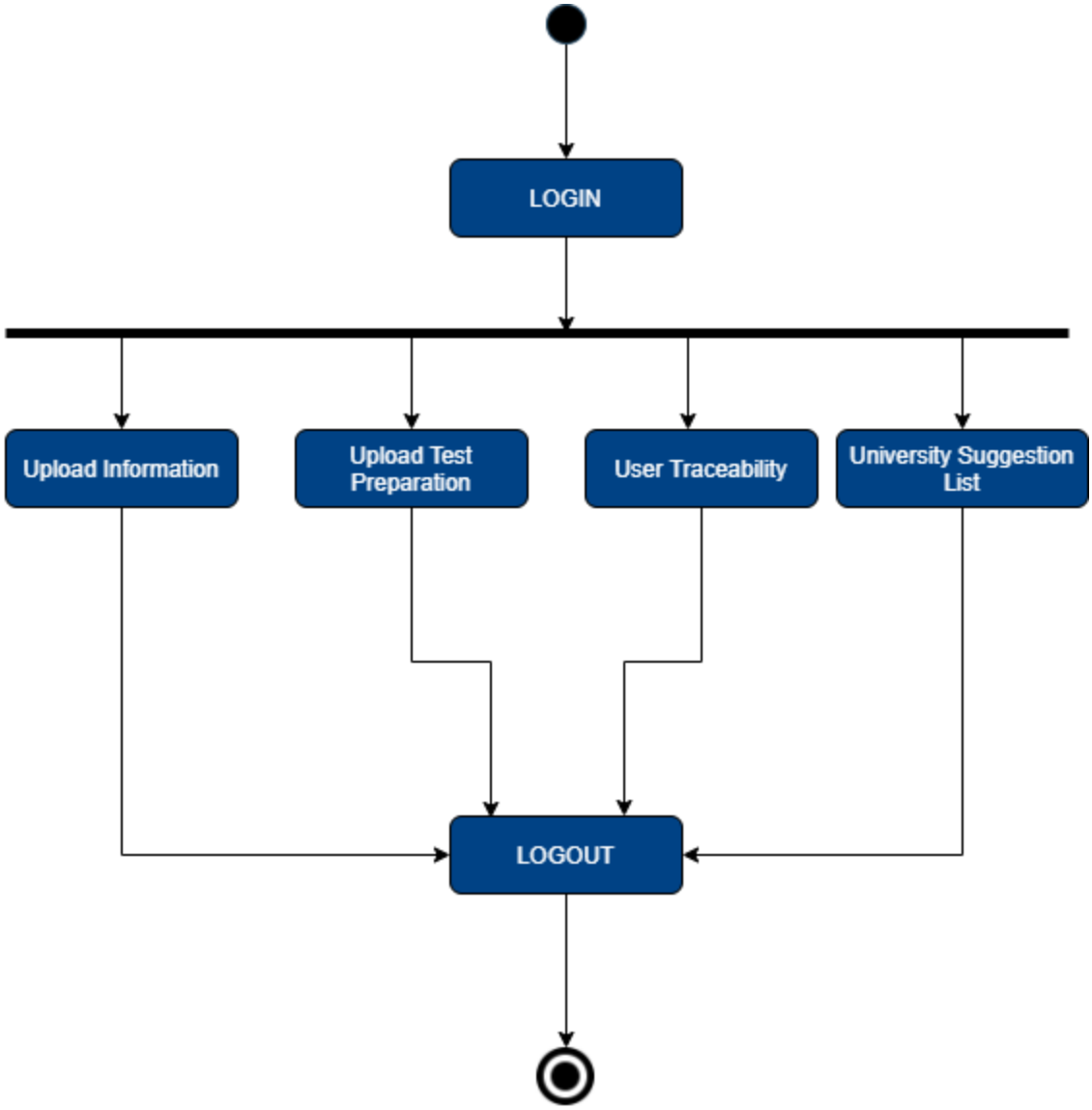
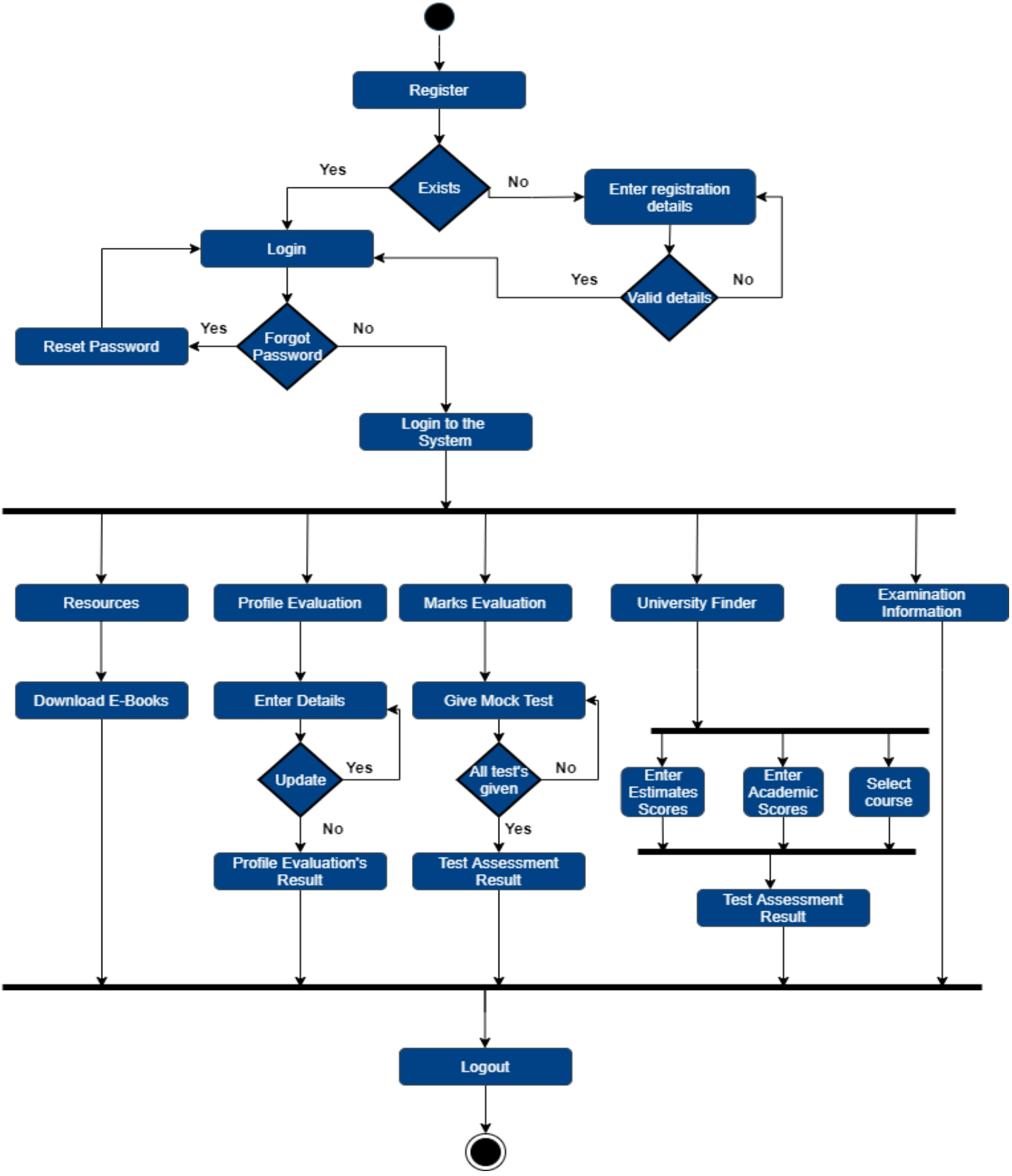


Figure : Activity diagram (Admin side)

The activities involved in the admin side of application are explained below:

- At first the admin logs on to the Forward Focus web application.
- Then he is prompted by a username-password pair for his/her account.
- If the username and password are valid, he is logged into the system.
- They can upload information that can be helpful for the users.
- They can upload test preparation material.
- They can also monitor users' activity to maintain the server.

5.4.2. User side Activity diagram



The activities involved in the user side of application are explained below:

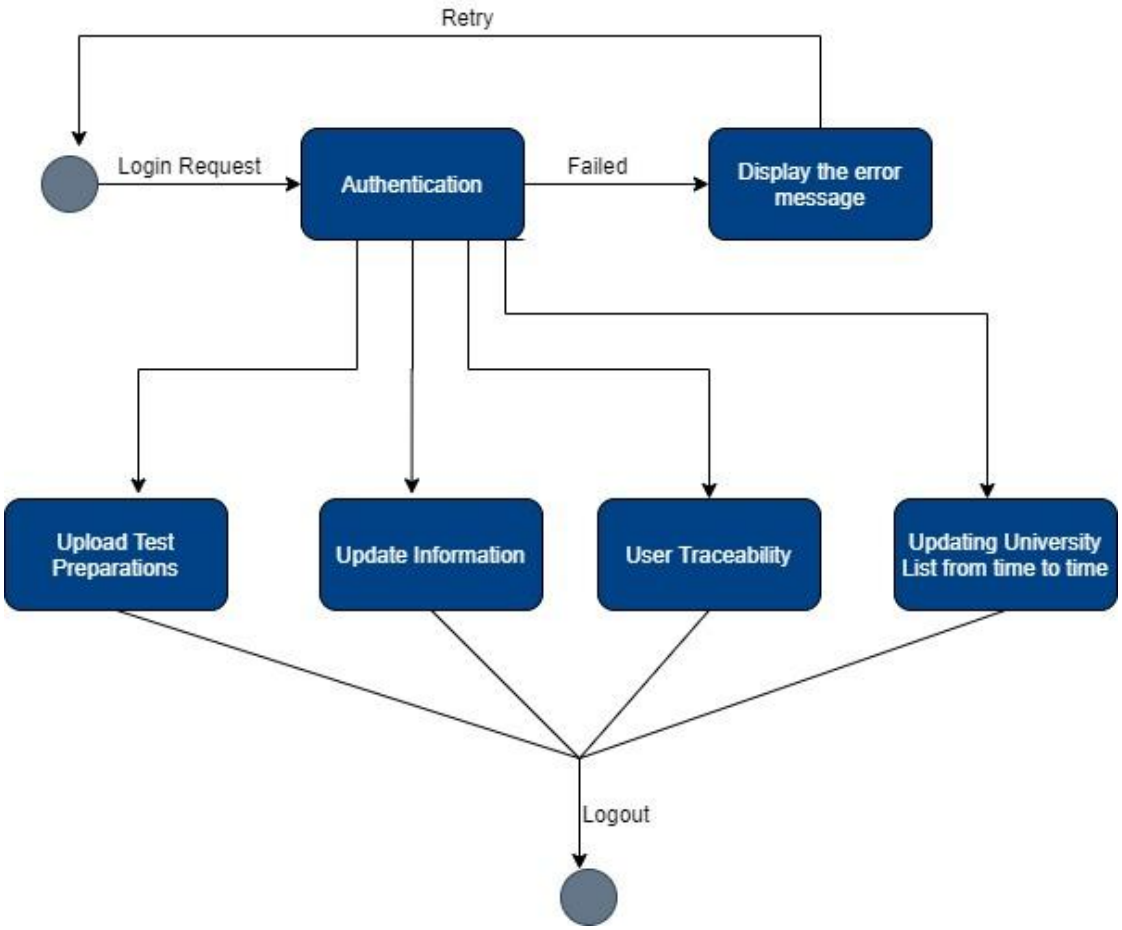
- At first the user logs on to the Forward Focus web application.
- Then he/she is prompted by a username-password pair for his/her account.
- If the username and password are valid, he/she is logged into the system.
- Now he must enter the required details to get services customized according to his/her areas of interests.

5.5 State Diagram

State Diagram represents a particular state,condition or a part of the system. State diagrams are used to state the events responsible for the change in state. So basically a state diagram is used to model the dynamic behavior of a class in response to time and changing external stimuli.

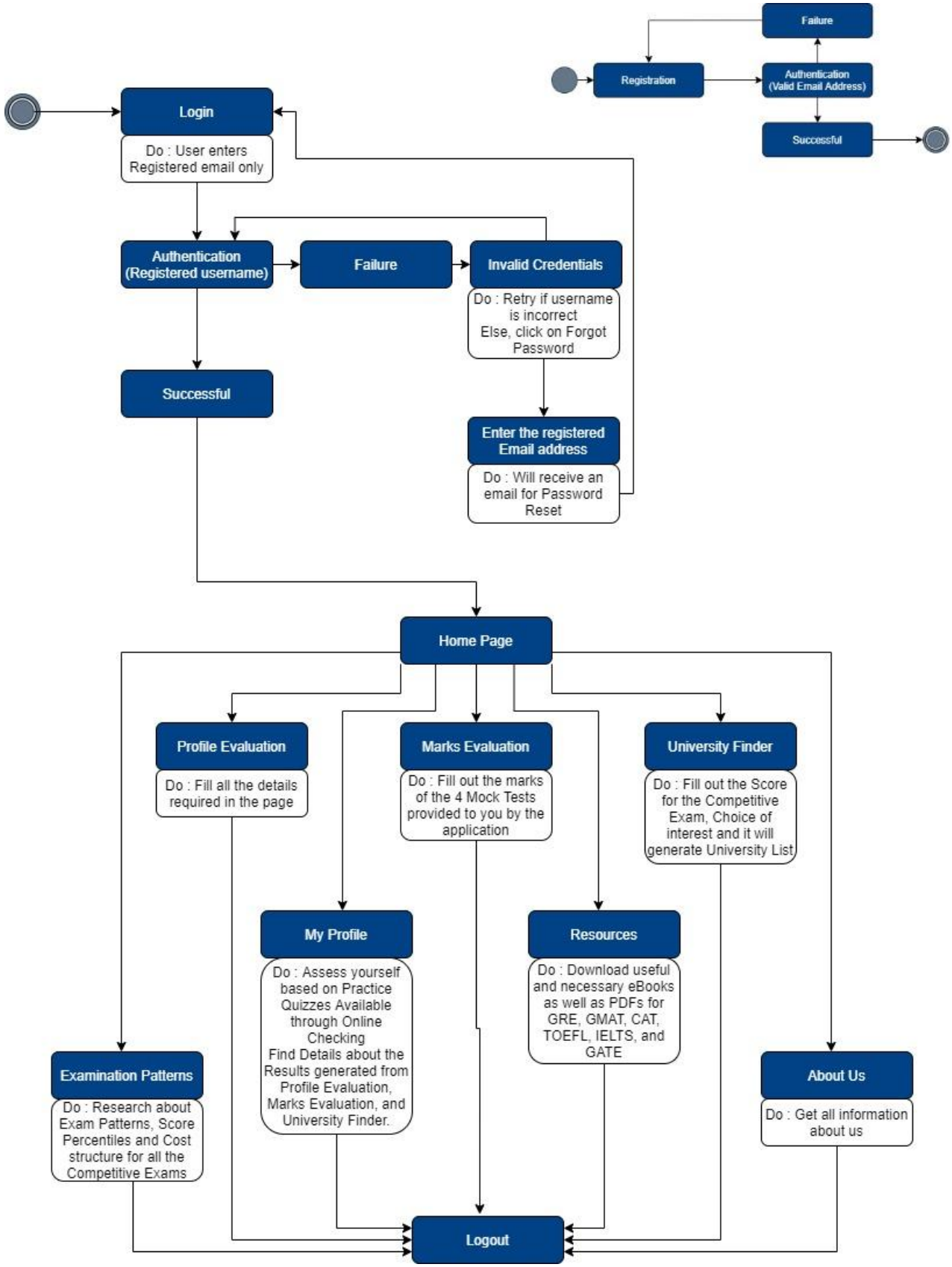
5.5.1 Admin side state diagram

- Initially the state is in login state, it moves towards authentication.
- If authentication is denied the state changes and comes back to the initial stage.
- If authentication is accepted the state changes and moves to Home page state.
- Admin can upload information, data, test papers etc.
- Lastly state changes to logout.



5.5.1 User side state diagram

- Initially the state is in login state, it moves towards authentication.
- If authentication is denied the state changes and comes back to the initial stage.
- If authentication is accepted the state changes and moves to Home page state.
- To proceed further the user enters information and moves towards test recommendations and preparations according to his areas of interests.
- User then evaluates himself by attempting the tests.
- After the evaluation phase the appropriate universities are suggested.
- Lastly State changes to logout.


Failure
Registration
Authentication (Valid Email Address)
Successful
Login
Do : User enters Registered email only
Authentication (Registered username)
Failure
Invalid Credentials
Do : Retry if username is incorrect Else, click on Forgot Password
Successful
Enter the registered Email address
Do : Will receive an email for Password Reset
Home Page
Profile Evaluation
Do : Fill all the details required in the page
Marks Evaluation
Do : Fill out the marks of the 4 Mock Tests provided to you by the application
University Finder
Do : Fill out the Score for the Competitive Exam, Choice of interest and it will generate University List
My Profile
Do : Assess yourself based on Practice Quizzes Available through Online Checking Find Details about the Results generated from Profile Evaluation, Marks Evaluation, and University Finder.
Resources
Do : Download useful and necessary eBooks as well as PDFs for GRE, GMAT, CAT, TOEFL, IELTS, and GATE
Examination Patterns
Do : Research about Exam Patterns, Score Percentiles and Cost structure for all the Competitive Exams
About Us
Do : Get all information about us
Logout

6. Operational Scenarios

6.1 Requirements Traceability Matrix

Process	Purpose	Description	Priority	Frequency	Status
Registration	Web-based Career Counselling	Users can register through the website and may choose to consider their Competitive Exam through their personal interests and finally receive their desired Universities abroad.	High	Once	TC_Registration_001-PASS TC_Registration_002-PASS TC_Registration_003-PASS TC_Registration_004-PASS TC_Registration_005-PASS TC_Registration_006-PASS TC_Registration_007-PASS TC_Registration_008-PASS TC_Registration_009-PASS
Profile Evaluation	Evaluation of Profile based on interests, and current stream of education.	Complete Profile Evaluation includes a detailed survey that collects information regarding the user's interests, his current educational	High	Once	TC_PROFILE_EVAL_001-PASS TC_PROFILE_EVAL_002-PASS TC_PROFILE_EVAL_003-PASS TC_PROFILE_EVAL_004-PASS TC_PROFILE_EVAL_005-PASS TC_PROFILE_EVAL_006-PASS

		courses, his academic performance. This helps the admin get an overview regarding the user.			TC_PROFILE_EVAL_007-PASS TC_PROFILE_EVAL_008-PASS TC_PROFILE_EVAL_009-PASS
Competitive Exam Pattern	Complete Pattern Specifications based on the type of Competitive Exam	The Pattern Specifications and their respective Information is to inform the students/ Users regarding the ongoing exam patterns and evaluations.	High	Daily	TC_PROFILE_EVAL_001-PASS TC_PROFILE_EVAL_002-PASS TC_PROFILE_EVAL_003-PASS TC_PROFILE_EVAL_004-PASS TC_PROFILE_EVAL_005-PASS TC_PROFILE_EVAL_006-PASS TC_PROFILE_EVAL_007-PASS TC_PROFILE_EVAL_008-PASS TC_PROFILE_EVAL_009-PASS
Resources	Plentiful resources to help prepare better and faster.	Various Resources and Online Materials will help prepare and brace the various aged-groups of students well for the upcoming exams and their respective patterns.	High	Daily	TC_DownloadResources_001-PASS TC_DownloadResources_002-PASS TC_DownloadResources_003-PASS TC_DownloadResources_004-PASS
Test Generati	Mock Tests to	Mock Tests are one key that helps	High	Once	TC_MARKS_EVAL_001-PASS TC_MARKS_EVAL_00

on	assess the ability of the users	provide accurate pattern schemes that are analogous to the Real Examinations, helping the students prepare better.			2-PASS TC_MARKS_EVAL_003-PASS TC_MARKS_EVAL_004-PASS TC_MARKS_EVAL_005-PASS TC_MARKS_EVAL_006-PASS
Marks Evaluation	Gives the Final Evaluation of the students based on the Prepared tests.	Marks obtained through the consecutive tests, account for the student to evaluate his/her self better, and to see where they stand.	High	Once	TC_MARKS_EVAL_001-PASS TC_MARKS_EVAL_002-PASS TC_MARKS_EVAL_003-PASS TC_MARKS_EVAL_004-PASS TC_MARKS_EVAL_005-PASS TC_MARKS_EVAL_006-PASS
University Suggestion	Providing the Final List of Suggested Universities that can be achieved.	Determining and understanding the list of Universities gives a clear view of the Potential Universities that the students may achieve.	High	Daily	TC_UniversitySuggestion_001-PASS TC_UniversitySuggestion_002-PASS TC_UniversitySuggestion_003-PASS TC_UniversitySuggestion_004-PASS TC_UniversitySuggestion_005-PASS TC_UniversitySuggestion_006-PASS TC_UniversitySuggestion_007-PASS TC_UniversitySuggestion_008-PASS TC_UniversitySuggestion_009-PASS TC_UniversitySuggestion_0010-PASS TC_UniversitySuggestion_0011-PASS TC_UniversitySuggestion_0012-PASS TC_UniversitySuggestion_0013-PASS

					TC_UniversitySuggestion_0014-PASS TC_UniversitySuggestion_0015-PASS TC_UniversitySuggestion_0016-PASS

6.2 Student Resources

Creation and editing of customer profiles including default email information, eligibility details, flexibility and restriction relevant parameters, details relevant to his/her career, and suggestions regarding the university. The information below sets out the main customer data management criteria.

Major Functions:

- CREATE - Creating a student profile
- EDIT - Editing Student profile
- DELETE - Deleting Student profile
- REVIEW- Review student profile
- SEARCH- Search for online resources
- ADD- Add student information

THEME	**I WANT TO..**	**SO THAT..**	**USE CASE**	**NOTES**
User Interface	Access the Student Profile	I can add, edit, or review customer-related information	**<given>**a user with rights to customer module needs to launch customer module **<when>**the user selects a customer tab/button/section	UI design for module accessibility will be important

			<then>customer module is displayed	
User Interface	Search for Resources	I can refer to the particular material	**<given>**a user needs to quickly search for a single or multiple resources **<when>**the admin provides full or partial resources **<then>** the application provides a single or multiple resources for the student to select	Search UI must be simple and fast. Wildcard searches required. Advanced search criteria required
User Interface	Create a New Profile	I can create a new profile	**<given>**a user has rights to create new user **<when>**the user selects Sign-up-function**<then>** the application provides a new form to enter required data	
User Interface	Delete Student Profile	I can delete after the website has served my purposes	**<given>**a user needs to delete his already existing profile **<then>** the application provides the required page so as to delete the respective profile	All associated data, including profile evaluation and marks evaluation, must be purged. A warning message should be displayed prior to submitting the request

General Data	Add Email Information	I can retain the information of my profile	**<given>** user has rights to create and edit user data **<when>**the user creates new or edits a user **<then>** allow the user to assign email information.	
General Data	Add Undergraduate details	I can evaluate my profile	**<given>** user has rights to create and edit user data **<when>**the user creates new or edits a user **<then>** allow the user to assign Undergraduate details.	

6.3 Admin Resources

Major Functions are:

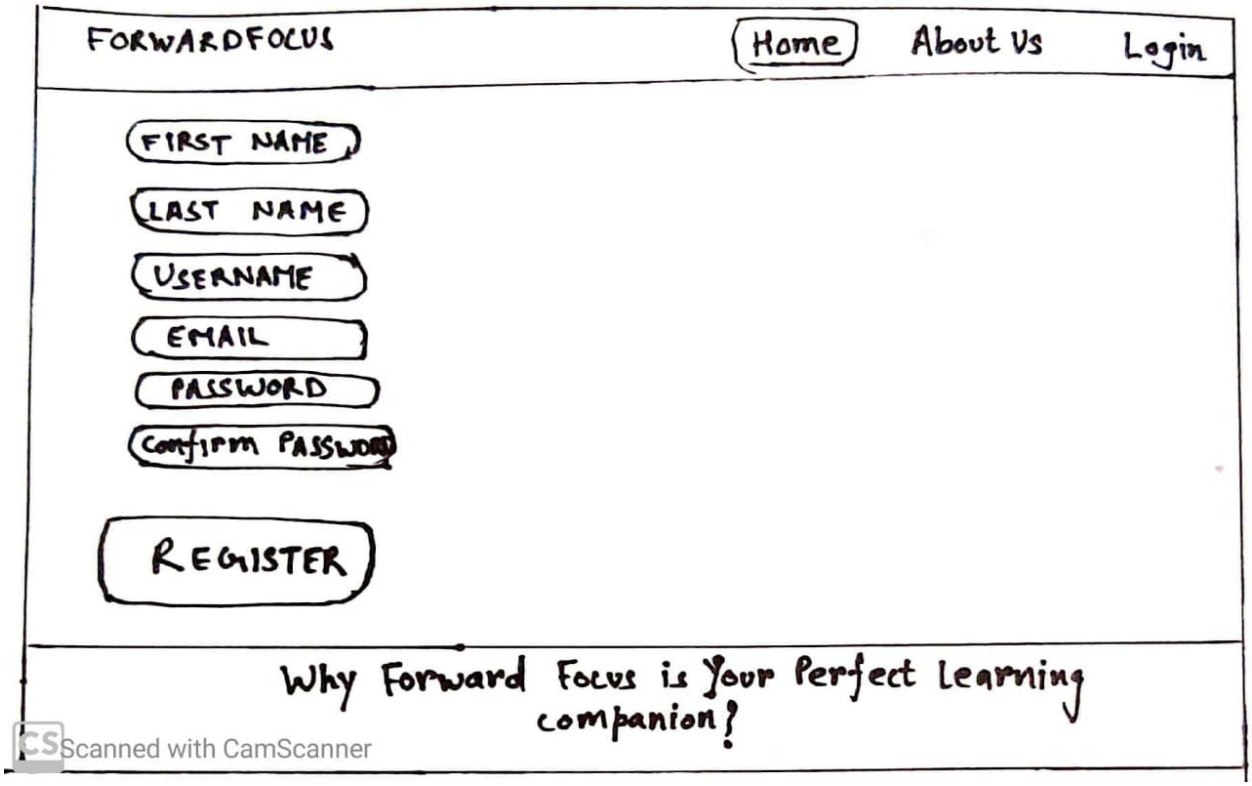
- Add- Add resources for students
- Review- Review Students
- Delete- Delete Student profile

THEME	**I WANT TO..**	**SO THAT..**	**USE CASE**	**NOTES**
User Interface	Access the Website	I can add, edit the resources needed by the student	**<given>**a user with rights to customer module needs to launch customer module **<when>**the user selects a customer	UI design for module accessibility will be important
User Interface	Access the student profile	I can review the student profile	tab/button/section **<then>**customer module is displayed	UI design for module accessibility will be important

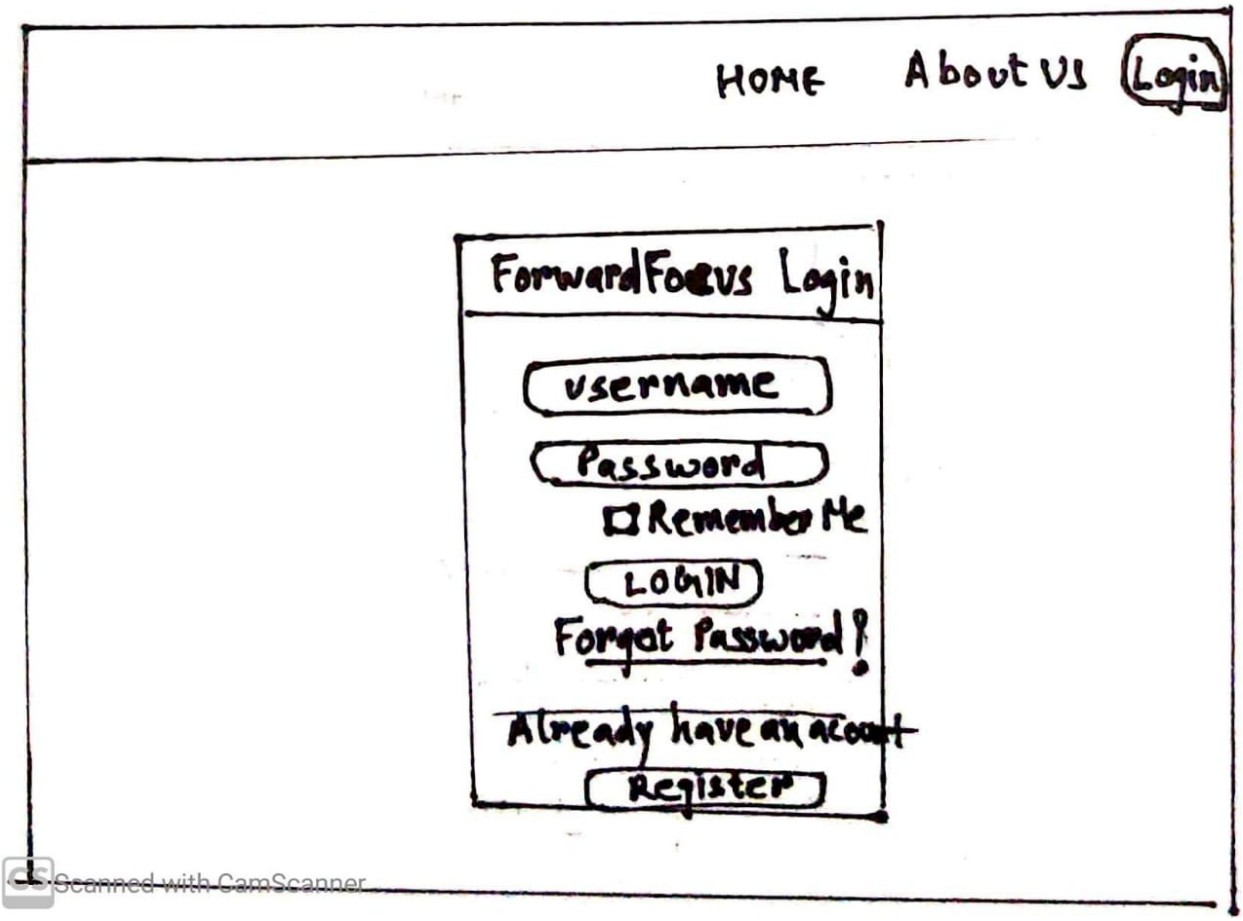
User Interface	Delete the student profile	I can delete the student profile which is involved in malpractices	**<given>**a user needs to delete his already existing profile **<then>** the application provides the required page so as to delete the respective profile	All associated data, including profile evaluation and marks evaluation, must be purged. A warning message should be displayed prior to submitting the request.

7. User Interface Design

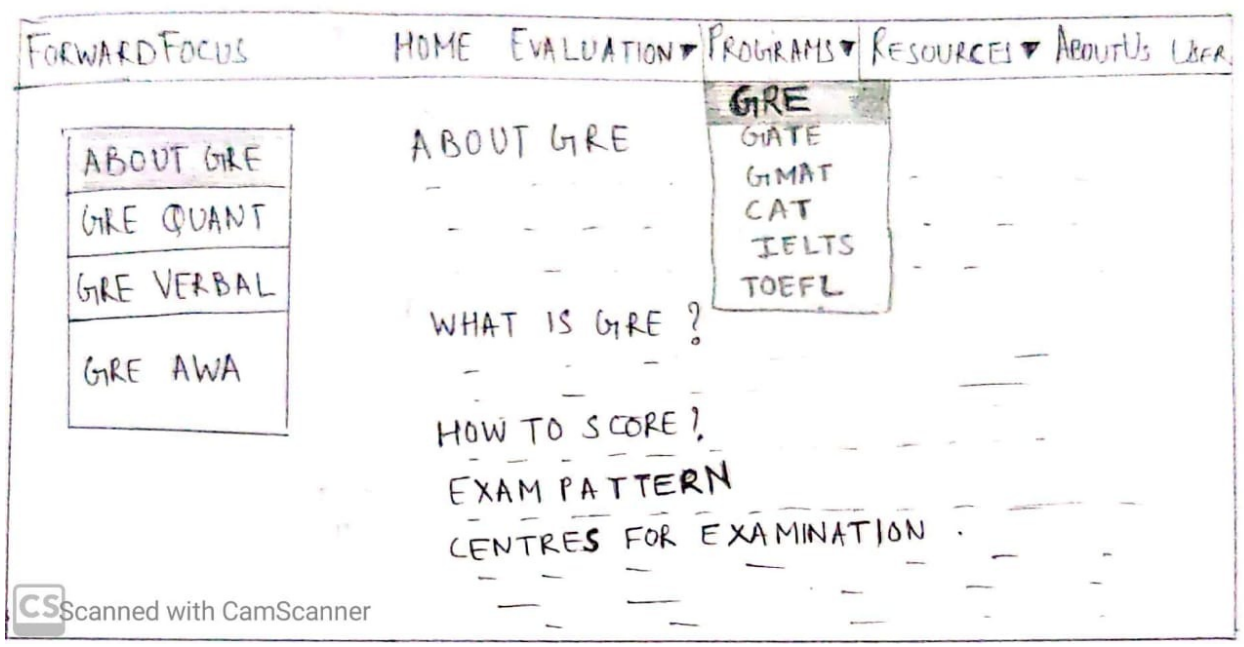
7.1 Register Page window



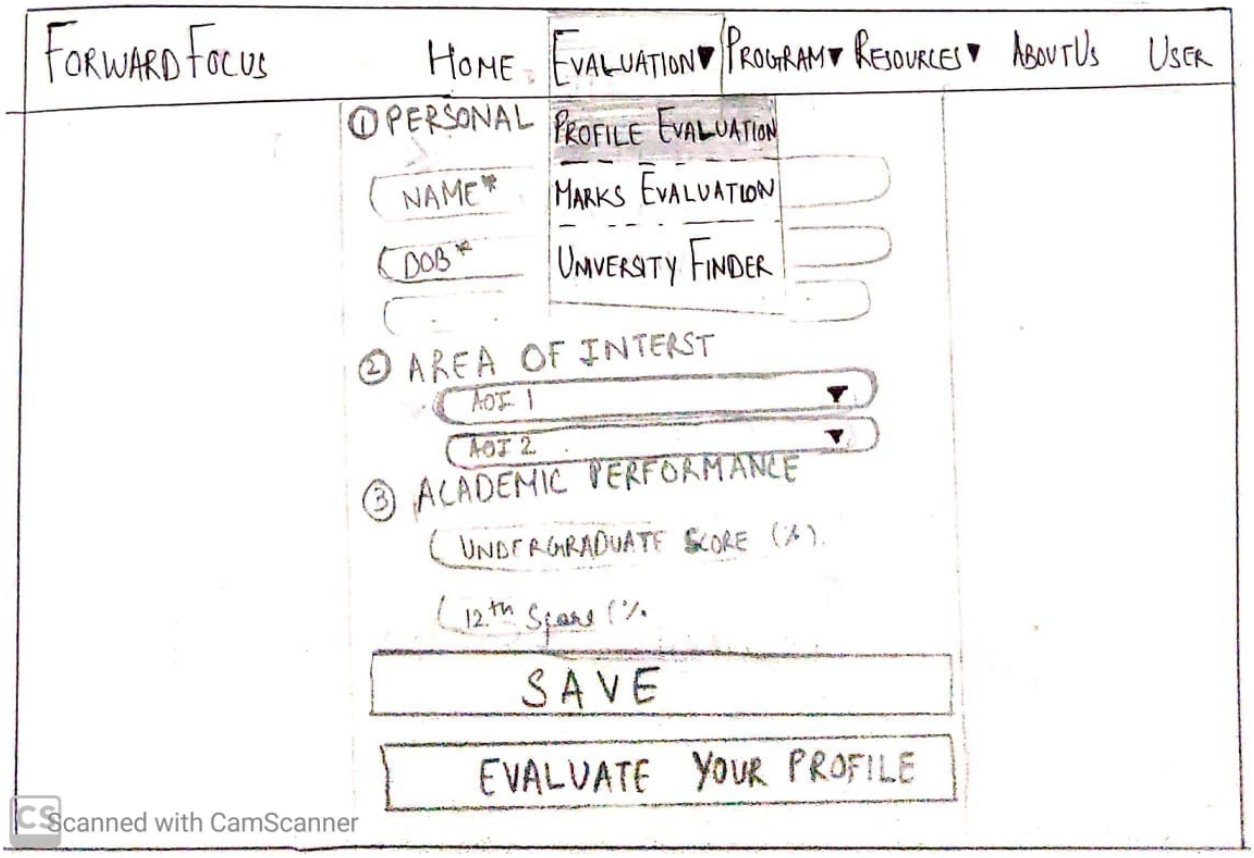
7.2 Login Page window



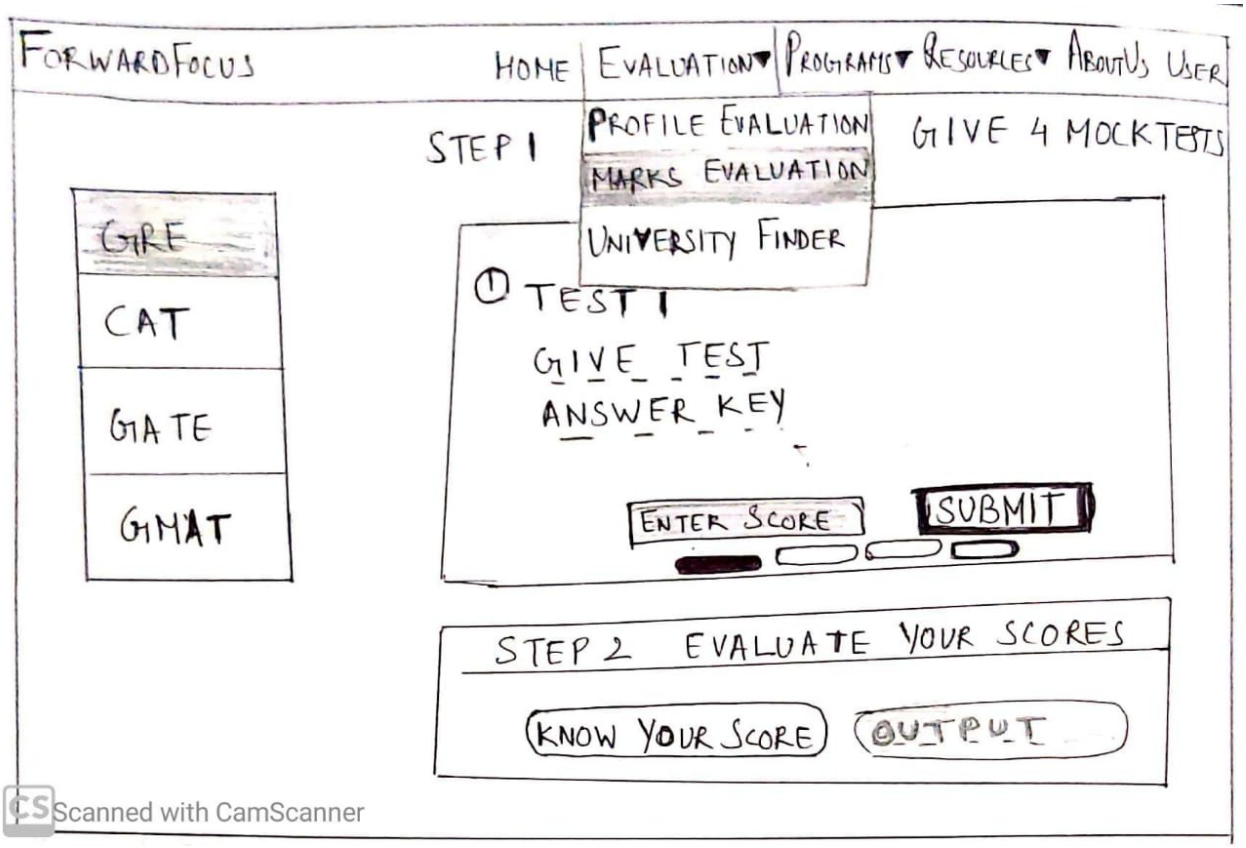
7.3 Home Page window



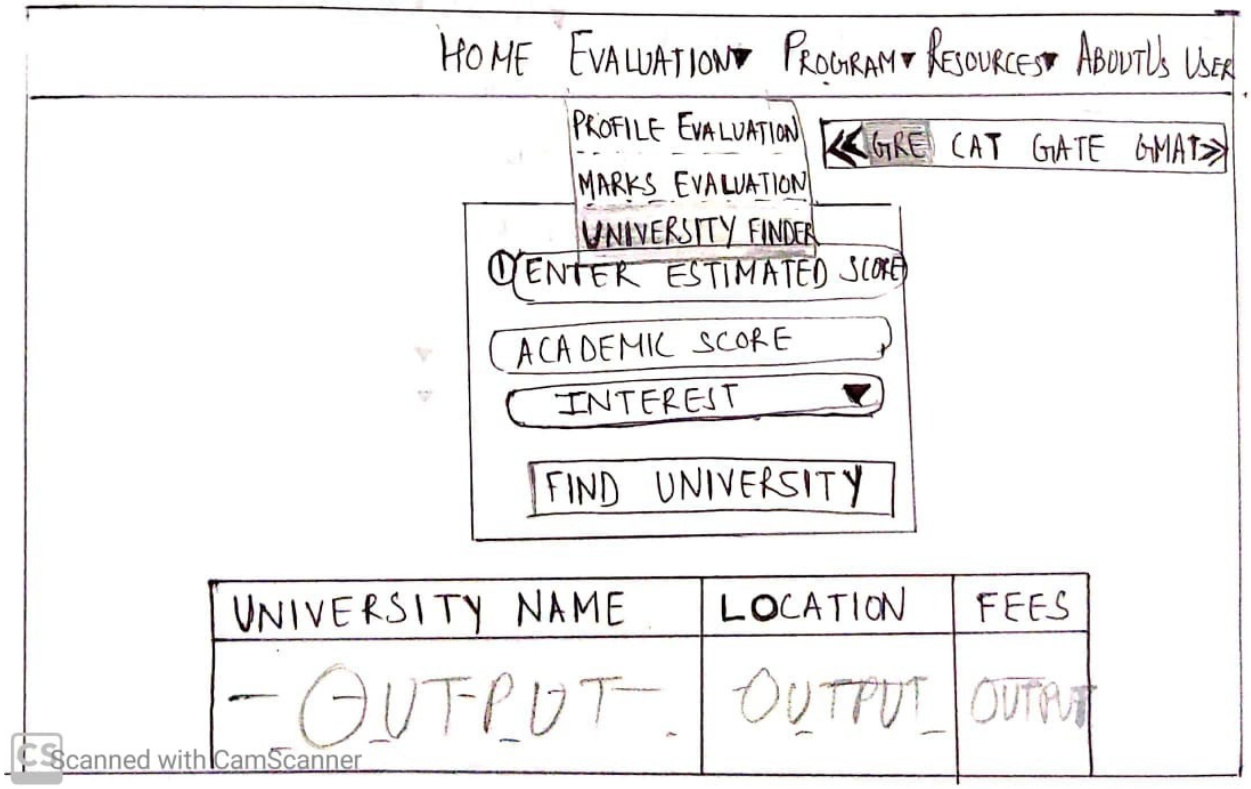
7.4 Profile Evaluation window



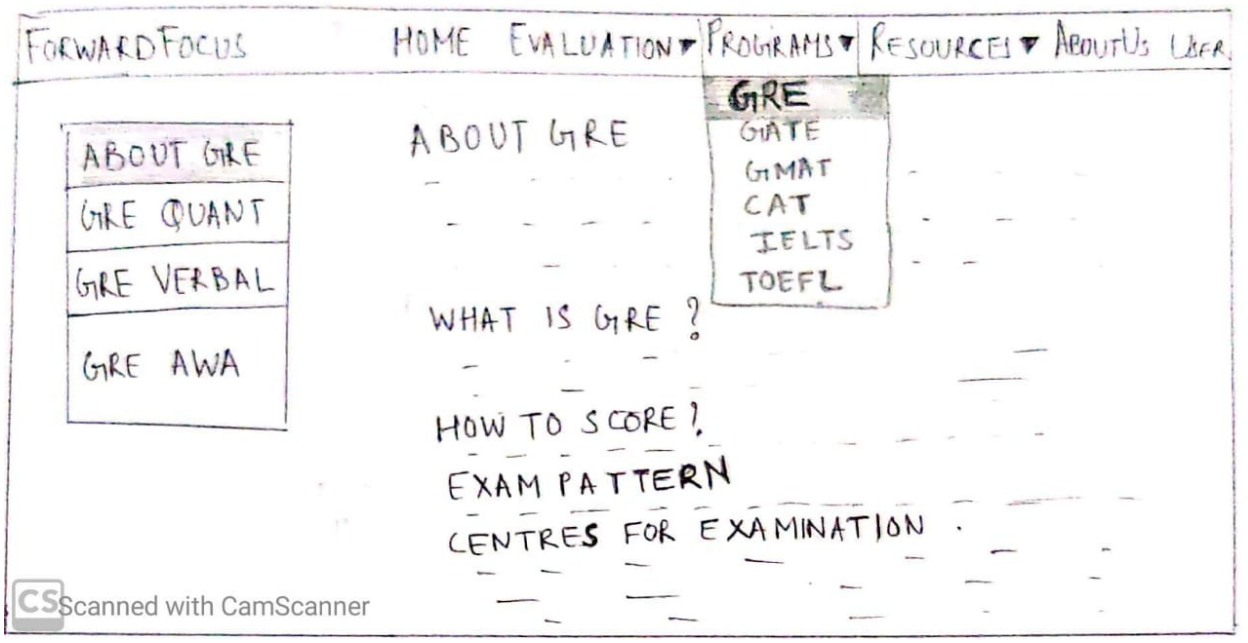
7.5 Marks Evaluation window



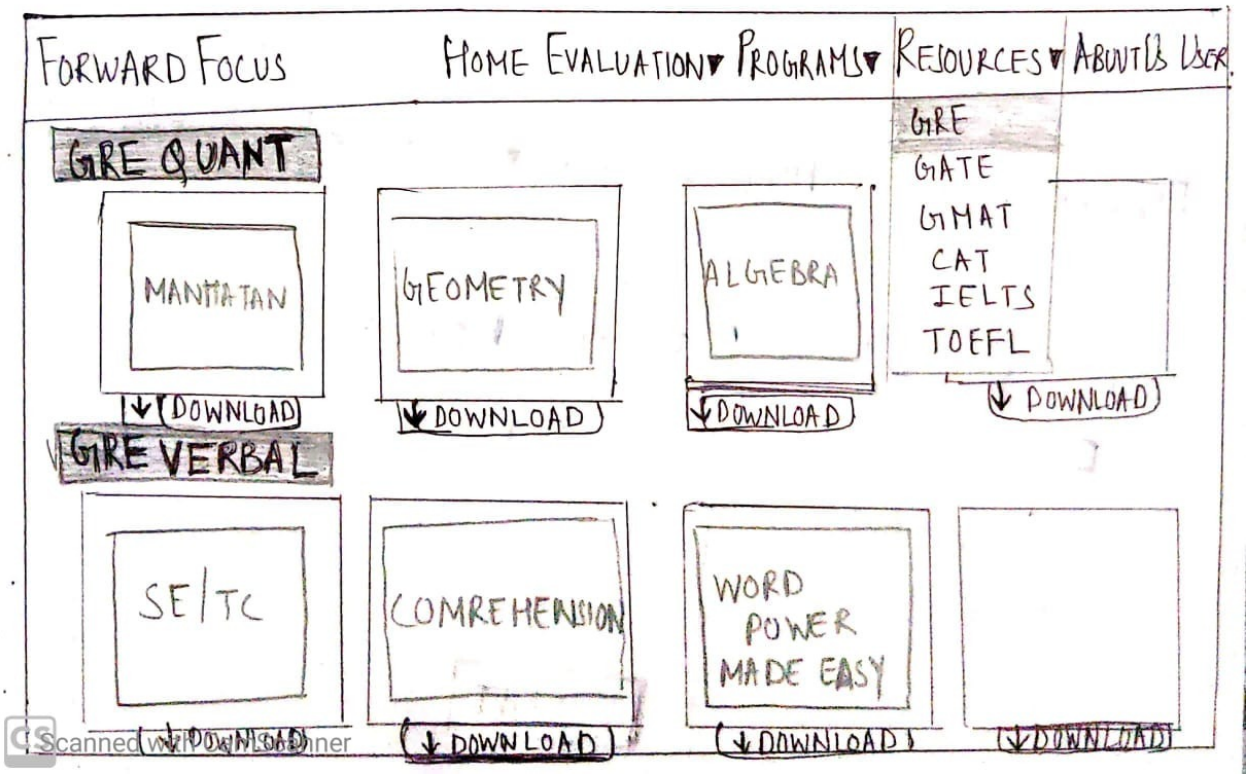
7.6 University Finder window



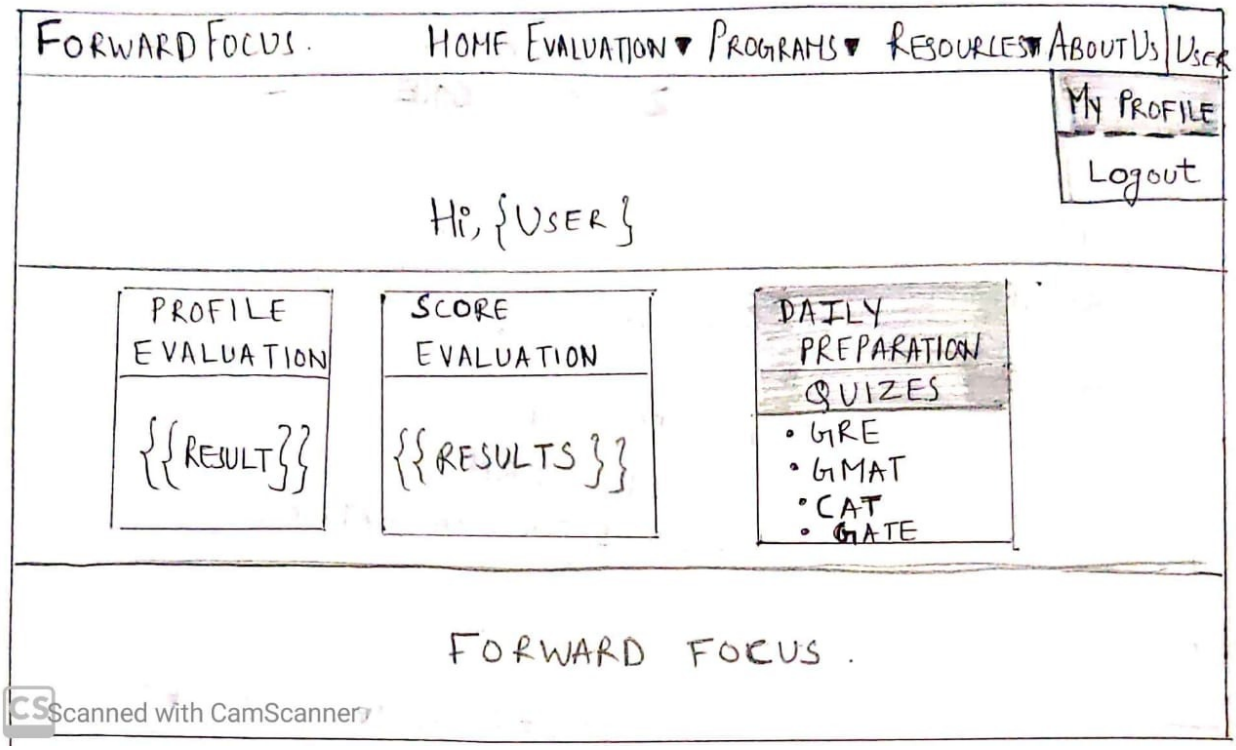
7.7 About GRE window



7.8 Download Resources window



7.9 Profile Page window



7.10 Quick Quiz window