

Software Design Document

for

RIT Placement Management System

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1 Objective

This Software Requirements Specification (SRS) document defines the requirements for the Placement Management System developed for Rajiv Gandhi Institute of Technology (RIT), Pampady. The product aims to automate and streamline placement-related activities, including event management, student registrations, notifications, and progress tracking.

2 Requirements

This section outlines the functional and non-functional requirements of the system.

PROBLEMS OF EXISTING SYSTEM	SOLUTIONS WITH PLACEMENT MANAGEMENT WEBSITE
Dependency on Emails	Centralized Platform for Notifications
Manual Registration Process	Online Registration with Payment Integration
Inefficient Communication	Interactive Communication
Limited Visibility for Students	Student Dashboard
Database Maintenance	Secure Database Management
Scalability Issues	Scalable and Flexible System

Figure 1: Requirement Overview Diagram

3 High Level Design

3.1 System Architecture

The system architecture provides an overview of the components and their interactions. The system architecture of the RIT Placement Management System consists of the following key components:

- **User Interface (UI Layer):** Includes students, placement cell staff, and admins who interact with the system through a web interface. Students can register, view placement drives, and track progress, while the placement cell manages drives and student applications.
- **Application Layer:** Handles business logic such as student registration, placement drive management, notifications, and AI-powered recommendations for matching students with suitable placement drives.
- **Data Layer:** Stores student data, placement drive details, and placement results, facilitating easy access and updates.
- **External Systems:** Integrates with Google services for notifications and verification, and includes a payment gateway for fee processing.
- **Monitoring & Reporting:** Generates placement statistics and reports for tracking student placements and drive outcomes.

The system uses React.js for the frontend, Node.js/Express.js for the backend, PostgreSQL for the database, and integrates with external APIs for verification and payment processing. This architecture ensures efficient placement management, secure student data handling, and seamless communication. The following is the architecture diagram:

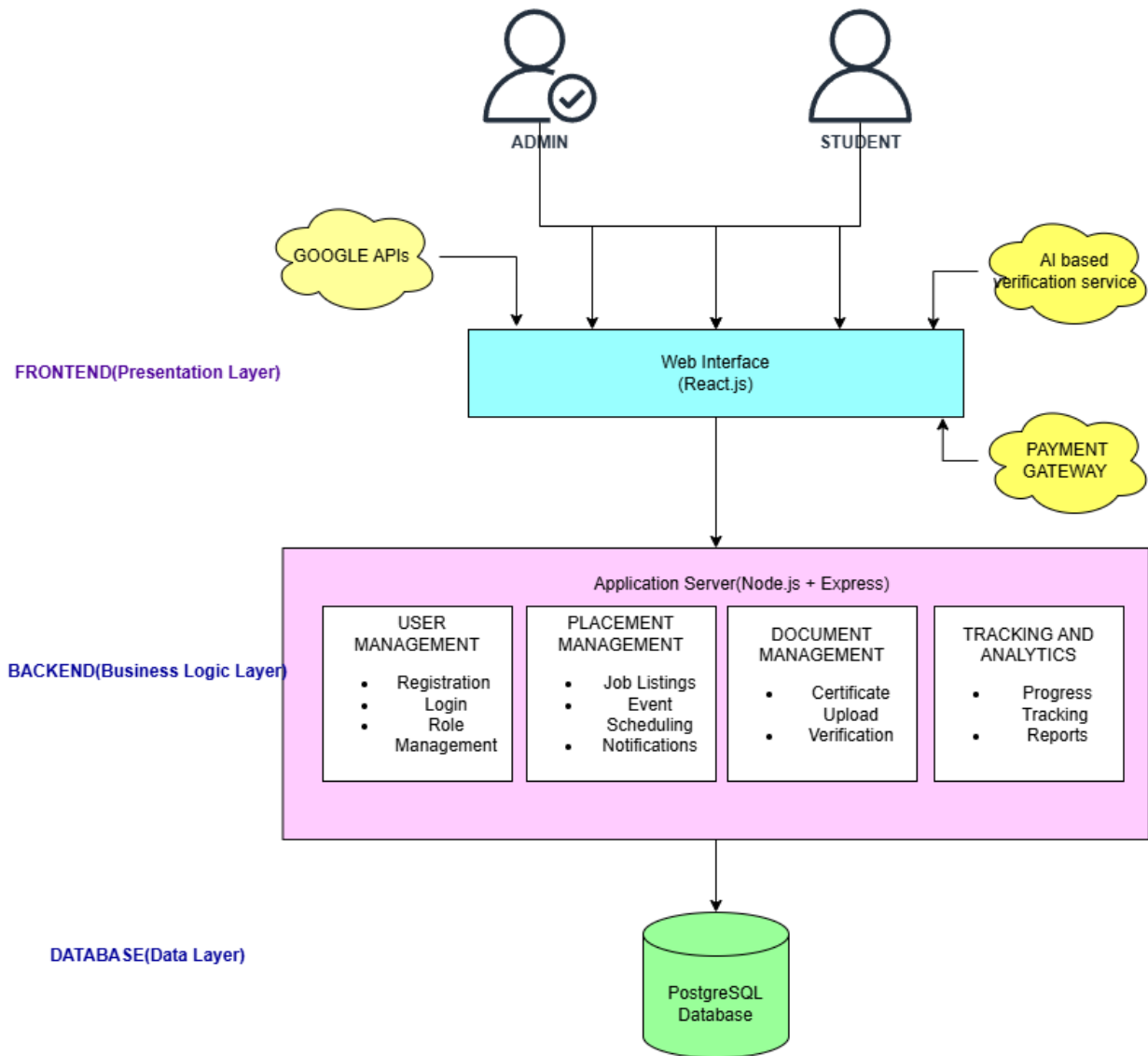


Figure 2: System Architecture Diagram

3.2 Data Flow Diagram

The Data Flow Diagram (DFD) illustrates the flow of information within the RIT Placement Management System. The system is represented at different levels of abstraction to show data flows between processes, data stores, and external entities.

Level 0 DFD

The Level 0 DFD provides a high-level view of the system's overall data flow. It shows two primary entities, the Student and the Placement Cell, with the system. Students can log in, register, upload certificates and resumes, and apply for placement drives, while the Placement Cell verifies registrations, publishes placement drive details, and manages result publication.

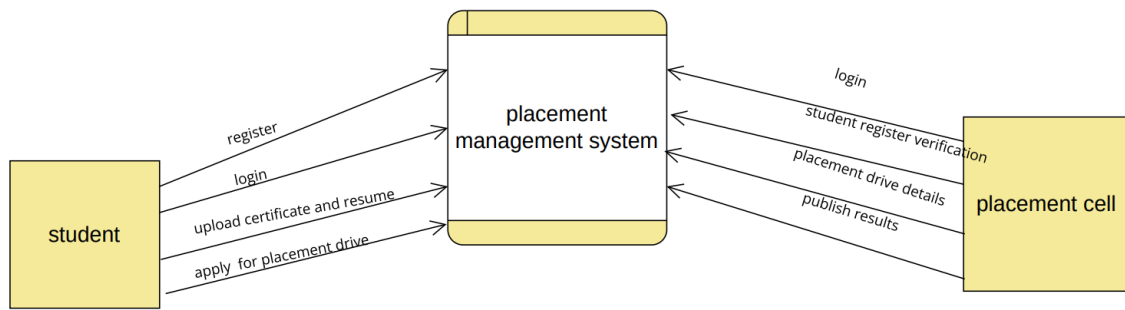


Figure 3: Level 0 Data Flow Diagram

Level 1 DFD

The Level 1 DFD breaks down the main processes from the Level 0 diagram into sub-processes to provide a more detailed view of data flow. Elaborates on the core processes, including student registration, login, application for placement drives, and uploading certificates and resumes. The Placement Cell handles verification of student registrations, publishing placement drive details, and releasing results, with detailed data flows like student details, placement drive details, and credentials linking the processes

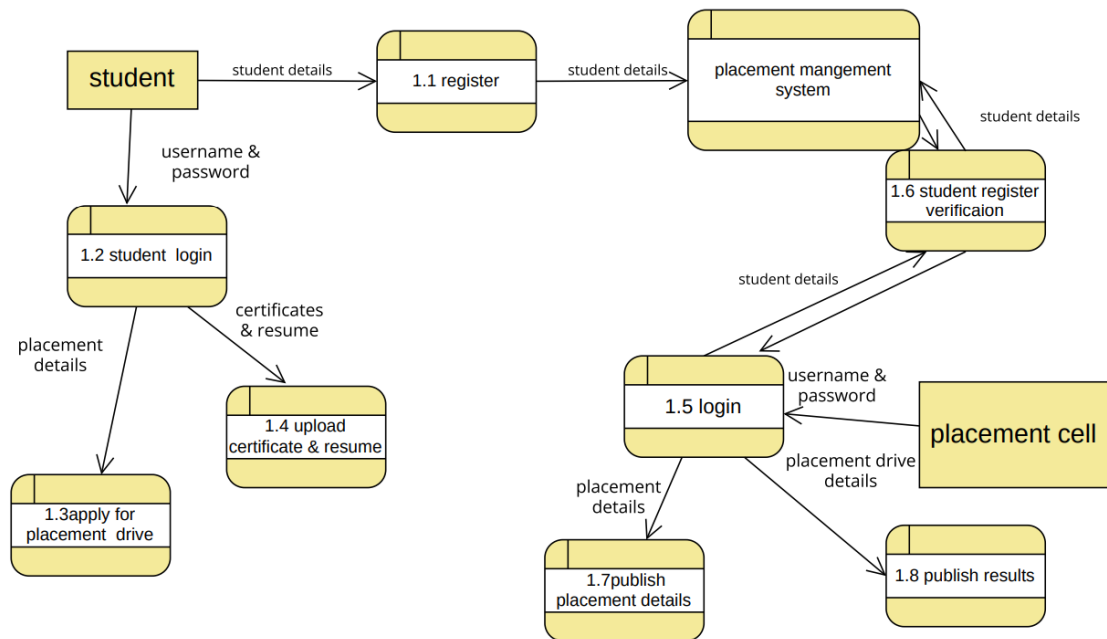


Figure 4: Level 1 Data Flow Diagram

Level 2 DFD

The Level 2 DFD further decomposes the processes from the Level 1 DFD into more granular sub-processes, giving a detailed perspective of the data flow. Detailed breakdowns of the processes. Students can register, log in, upload certificates and resumes, view placement and round details, apply for drives, and check round and placement results. The Placement Cell verifies and approves/rejects registrations, publishes placement drive and round details, and manages the publication of results, with clear data flows indicating exchanges like login credentials, student details, certificates, placement details, and results.

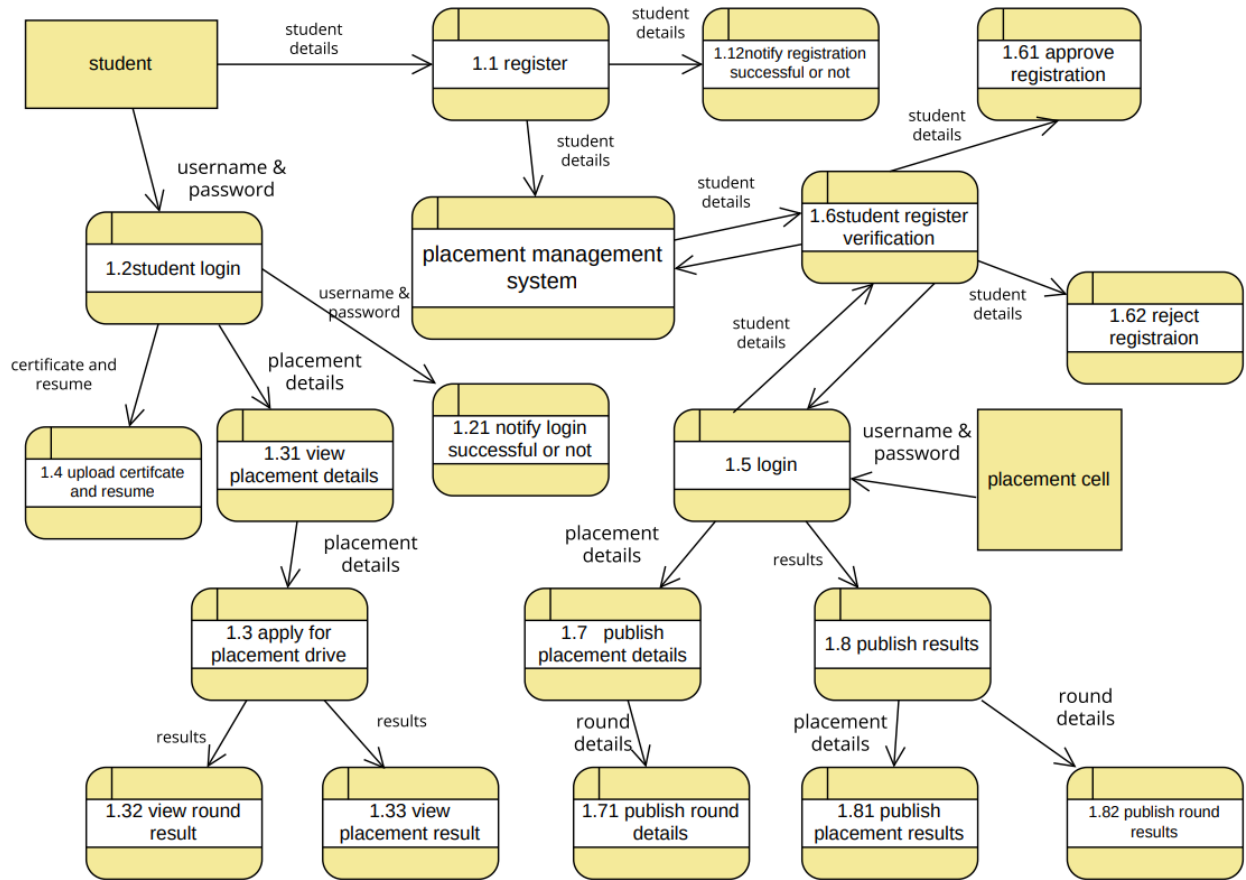


Figure 5: Level 2 Data Flow Diagram

4 Low Level Design

4.1 Usecase Diagram

This use case diagram depicts the functionalities of the RIT Placement Management System.

Key Actors:

- **Student:** Registers, uploads certificates and resumes, views placement drive details, checks eligibility, applies for drives, tracks application status, views results, and accepts/rejects job offers.
- **Placement Cell:** Verifies and approves/rejects student registrations, publishes placement drive details, provides student data to recruiters, collects results, and publishes them.

Main Features:

- **Registration Process:** Includes approval or rejection and notifications.
- **Login:** Handles errors if login fails.
- **Placement Drive Interaction:** Students can view, check eligibility, and apply for drives.
- **Results Management:** Students track and view results, while the placement cell manages data flow with recruiters.

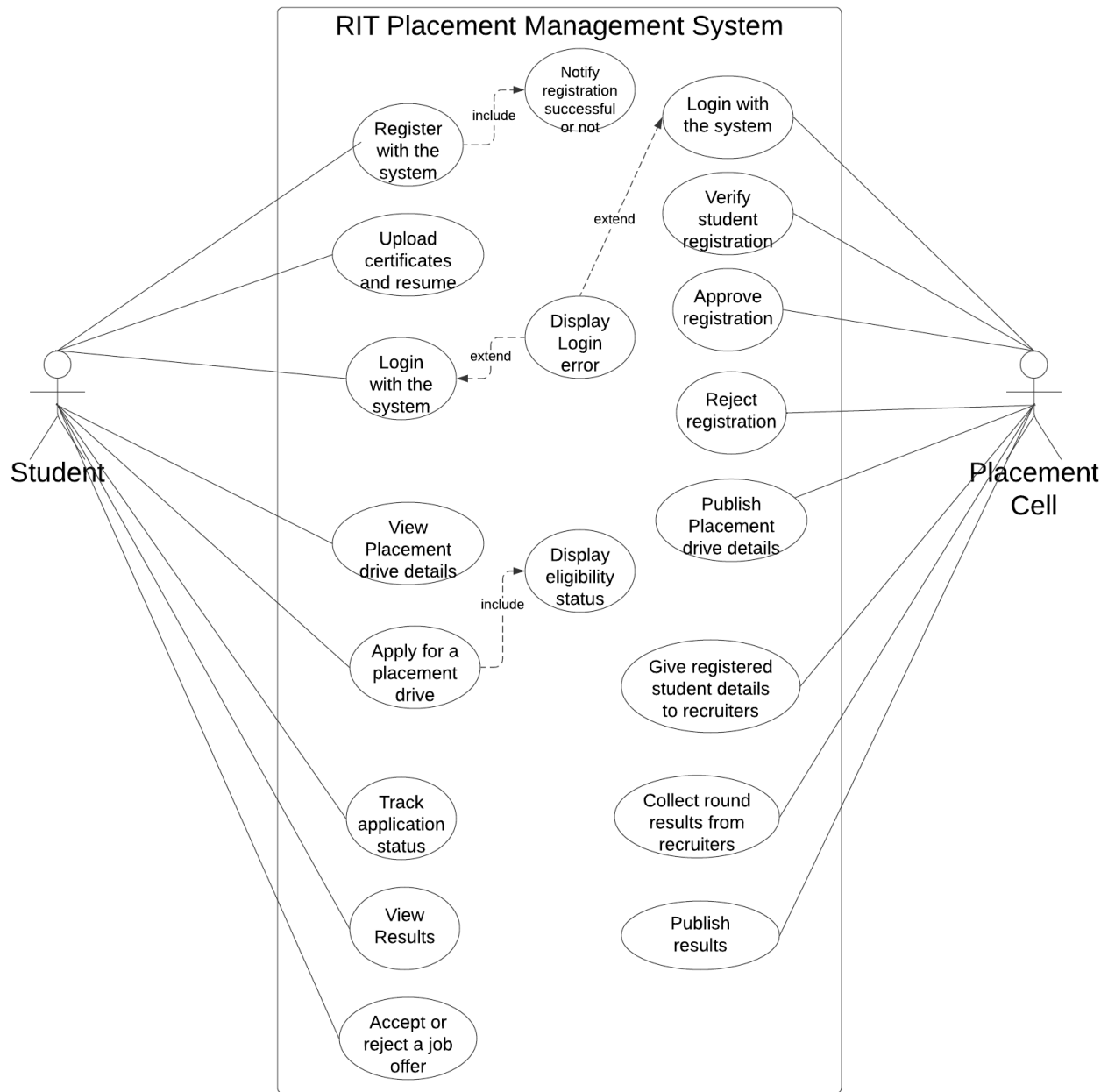


Figure 6: Usecase Diagram of the RIT Placement Management System

4.2 User Interface Design

The User Interface (UI) design focuses on creating a user-friendly and intuitive interface for the RIT Placement Management System. The following pages are essential components of the system and provide the necessary interactions for students and admins.

Homepage

The homepage serves as the entry point for users. It displays important information such as announcements, and options to log in or register.

Figure 7: Homepage of the RIT Placement Management System

Login Page

The login page allows students, placement cell staff, and admins to access the system securely by providing their credentials.

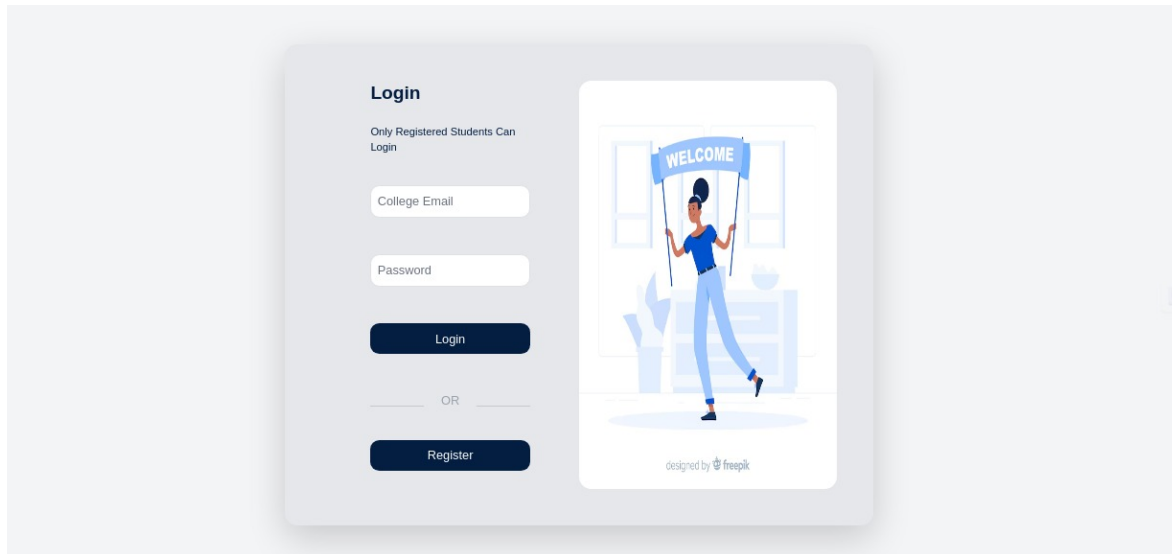


Figure 8: Login Page of the RIT Placement Management System

Student Registration Page

The student registration page allows new students to sign up for the placement system by providing their personal details, academic information, and uploading relevant documents like resumes and certificates.

The image displays a dark blue registration form titled 'Registration Form' under the 'RIT Career Connect' header. The form is divided into two columns. The left column contains fields for 'Your Name', 'Password', 'Phone', 'DOB' (with a date picker), 'Year of Study' (with a dropdown), 'College Email address', and 'Upload Certificate' (with a 'Choose file' button and 'No file chosen' text). The right column contains fields for 'KTU ID', 'Confirm Password', 'Gender' (with radio buttons for Male, Female, and Others), 'Course' (with a dropdown), 'Average CGPA' (with a dropdown), and 'Number Of Backlogs'. A disclaimer on the right states: 'All students are required to provide accurate and truthful information during the registration process. Submission of false or misleading data will result in disciplinary action, which may include penalties or further legal consequences. Please review your details carefully before submitting.' An illustration of a person sitting on a large tablet with various icons is located on the right side of the form. The top right corner has links for 'Home' and 'Login'.

Figure 9: Student Registration Page of the RIT Placement Management System

Student Dashboard

The student dashboard provides an overview of the student's placement progress, upcoming drives, application statuses, and results.

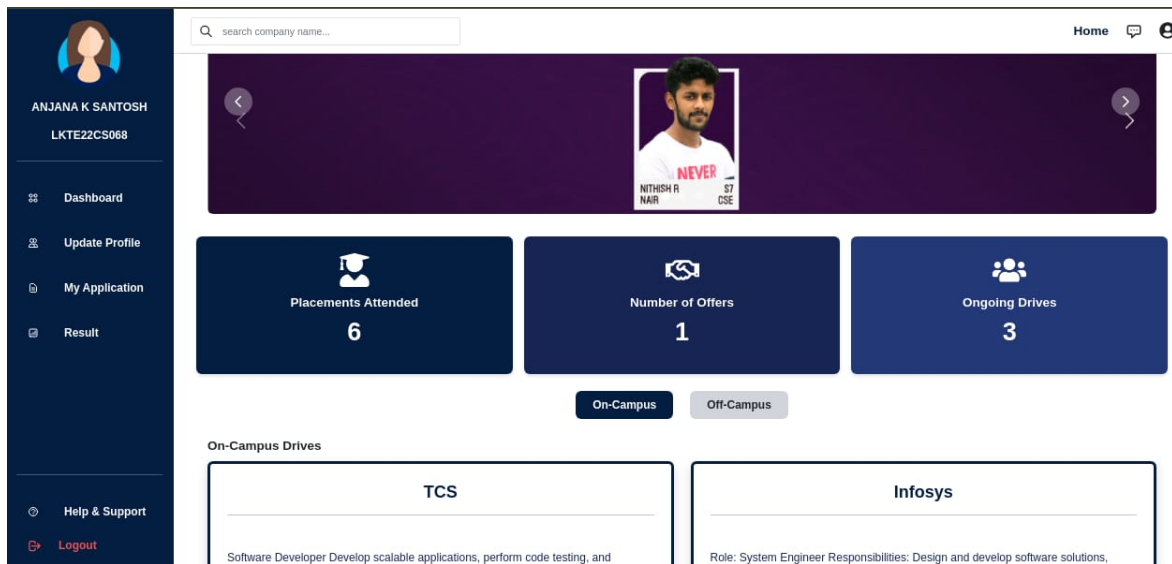


Figure 10: Student Dashboard of the RIT Placement Management System

Admin Dashboard

The admin dashboard allows placement officers and administrators to manage placement drives, student registrations, and other system configurations.

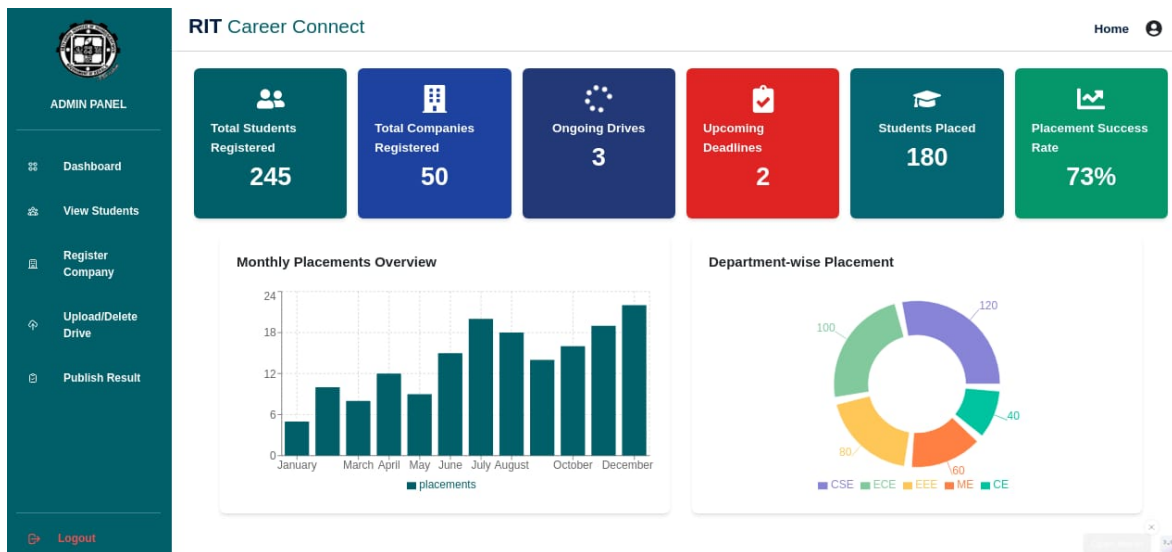


Figure 11: Admin Dashboard of the RIT Placement Management System

4.3 Database Design

The Database Design represents the structure of the RIT Placement Management System's database. The Entity-Relationship (ER) Diagram depicts the relationships between various entities within the system, such as students, placement drives, and results.

ER Diagram

The ER Diagram illustrates the key entities and their relationships. These entities include students, placement drives, registration details, and results. The diagram helps in understanding the data flow and relationships between the core components of the system.

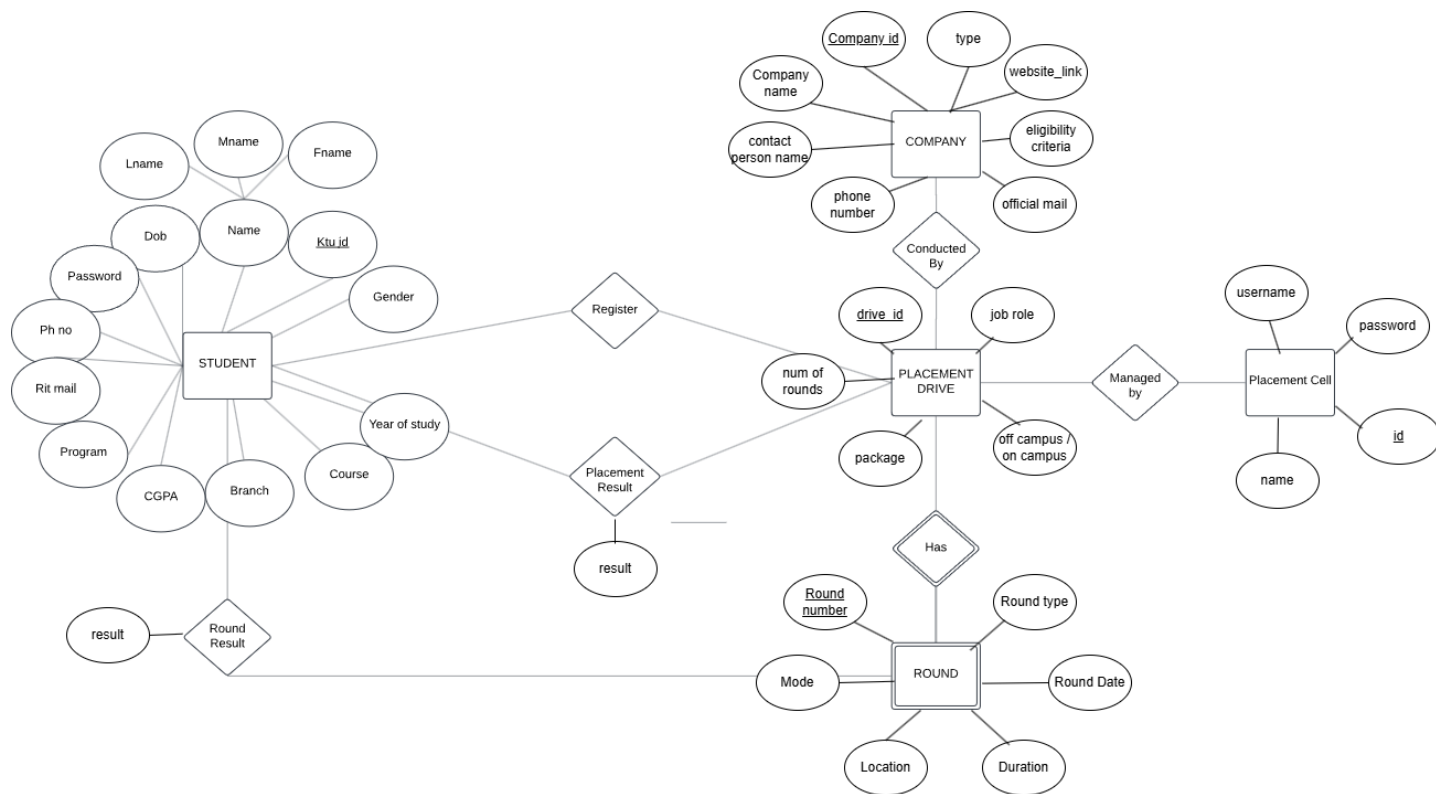


Figure 12: Entity-Relationship Diagram of the RIT Placement Management System

This ER diagram models a **Placement Management System** with the following components:

Entities and Attributes

- **STUDENT**: Includes details like name, ID, contact info, academic details (CGPA, branch, course, etc.).
- **COMPANY**: Includes company ID, name, type, contact details, eligibility criteria, etc.
- **PLACEMENT DRIVE**: Contains drive ID, job role, package, number of rounds, and location (on/off campus).
- **ROUND**: Includes round number, type, mode, location, duration, and date.
- **PLACEMENT CELL**: Manages placement activities with username, password, and admin details.

Relationships

- **Register**: Students register for placement drives.
- **Conducted By**: Companies conduct placement drives.
- **Managed By**: Placement drives are managed by the Placement Cell.
- **Has**: Placement drives consist of multiple rounds.
- **Placement Result**: Tracks student performance in each round.

This diagram effectively maps the entities and relationships involved in managing placements at an institution.

4.4 Activity Diagrams

Activity Diagrams illustrate the workflow of specific processes within the RIT Placement Management System. Below are the activity diagrams for key scenarios that represent the activities and decisions involved in various actions.

Student Registration

The activity diagram for student registration illustrates the steps a student follows to register for the placement system, from entering details to completing the registration process.

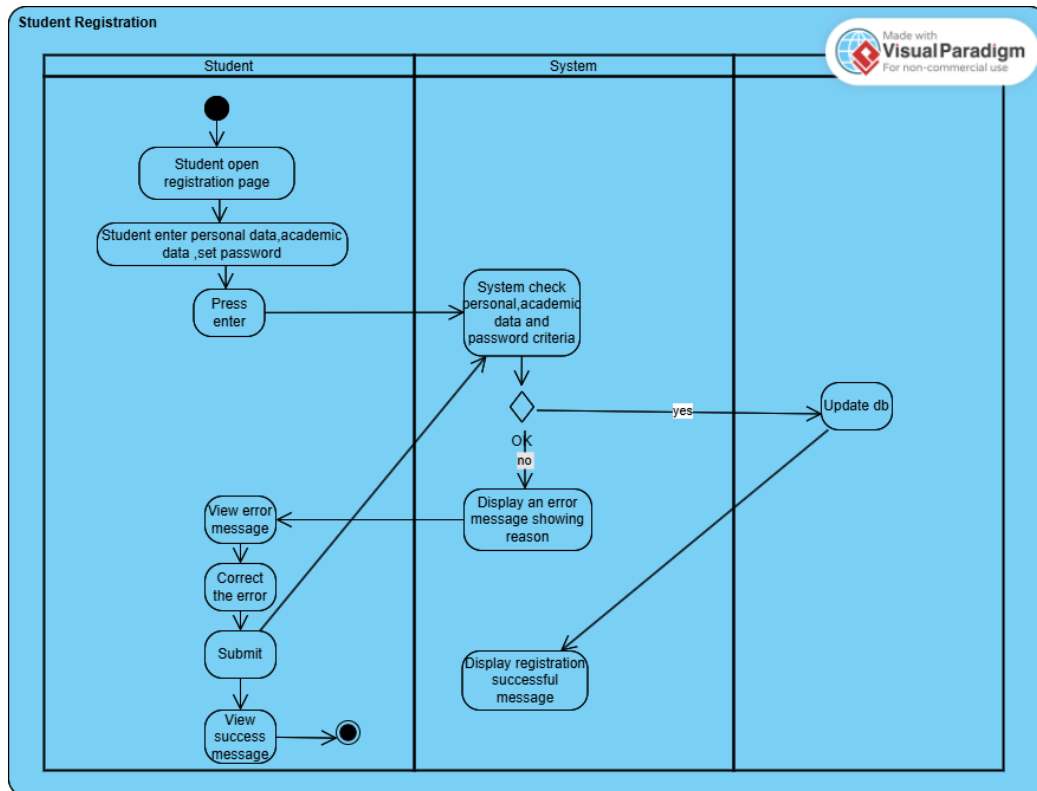


Figure 13: Activity Diagram for Student Registration

Student Applying for a Drive

This activity diagram shows the sequence of actions involved when a student applies for a placement drive, including checking eligibility, filling out the application, and submitting it.

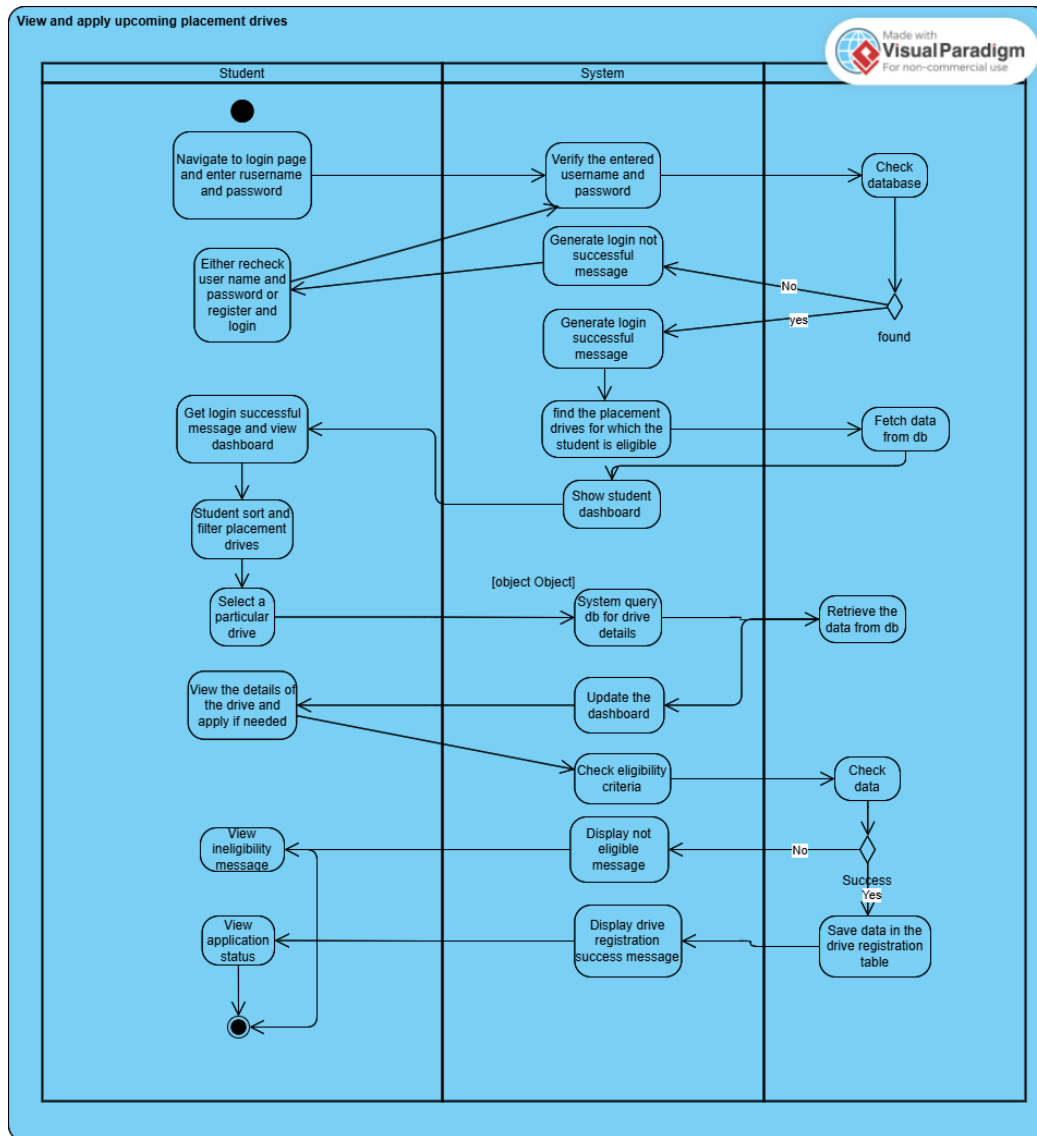


Figure 14: Activity Diagram for Student Applying for a Drive

Placement Officer Uploading a Drive

The activity diagram for uploading a placement drive shows the actions performed by the placement officer, including entering drive details, uploading them to the system, and making the drive available for students.

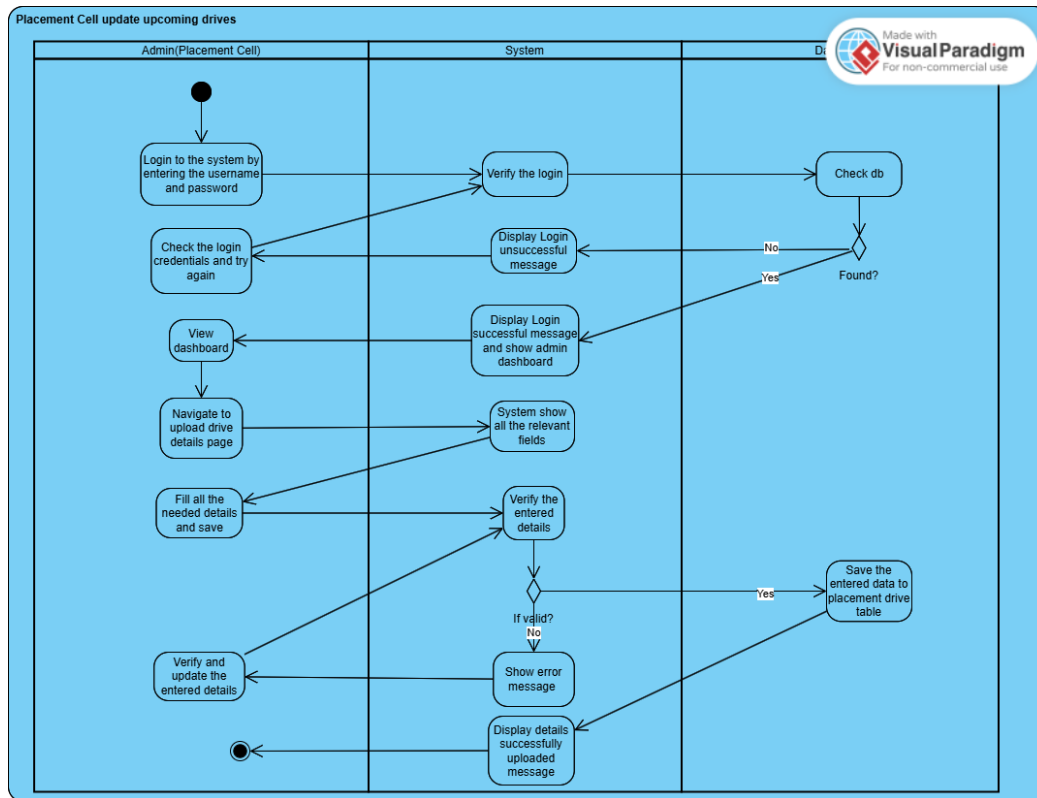


Figure 15: Activity Diagram for Placement Officer Uploading a Drive

Placement Officer Uploading Results of a Drive

This activity diagram depicts the steps a placement officer follows to upload results after a placement drive, including entering the results and publishing them.

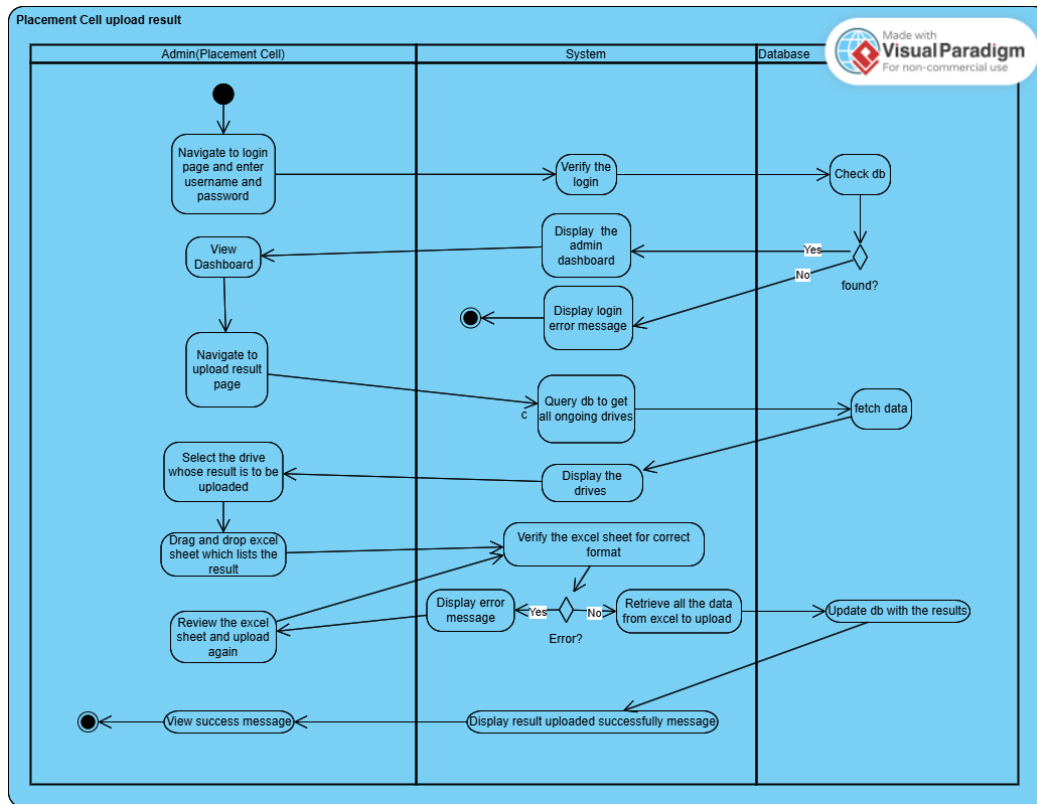


Figure 16: Activity Diagram for Placement Officer Uploading Results of a Drive

Student Viewing Results of Each Round

The activity diagram for viewing results illustrates how students check their results for each round of placement, including navigating to the results page and viewing detailed information.

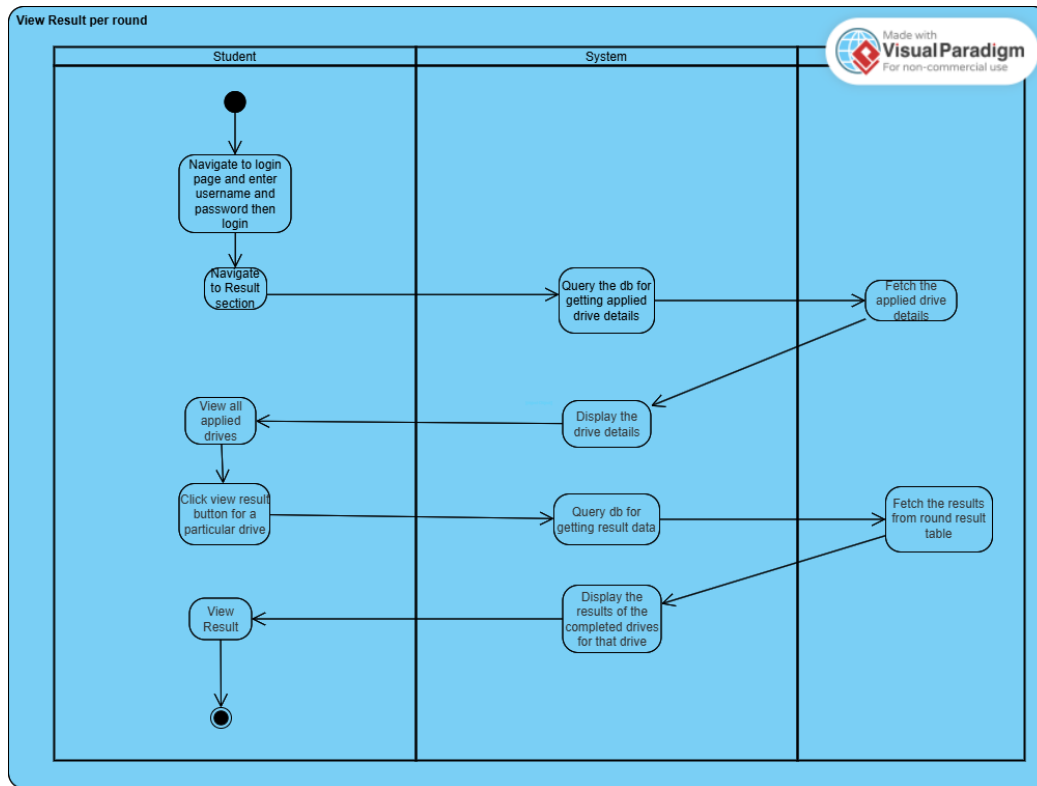


Figure 17: Activity Diagram for Student Viewing Results of Each Round

4.5 Algorithm Design

This section outlines the core algorithms used within the RIT Placement Management System. The algorithms will cover key functionalities of the system, ensuring efficient and correct processing of tasks.

Algorithm 1 Student Registration

1. Open Registration Page:

BEGIN

DISPLAY "Student opens registration page."

END

2. Enter Data:

BEGIN

INPUT PersonalData, AcademicData, Password

END

3. System Checks Data:

BEGIN

VALIDATE PersonalData, AcademicData, Password

IF data is valid **THEN**

UPDATE database with student details

DISPLAY "Registration successful."

ELSE

DISPLAY "Error: Invalid data."

PROMPT student to correct errors

ENDIF

END

4. Correct Errors (if applicable):

BEGIN

INPUT CorrectedData

VALIDATE CorrectedData

IF data is valid **THEN**

UPDATE database with corrected details

DISPLAY "Registration successful."

ELSE

DISPLAY "Error: Invalid data. Resubmit."

ENDIFEND

Algorithm 2 View Upcoming Placement Drives

1. Login:

BEGIN

DISPLAY "Open the login page."

INPUT username, password

VERIFY credentials

IF credentials are valid **THEN**

DISPLAY "Login successful."

SHOW student dashboard

ELSE

DISPLAY "Login unsuccessful. Check credentials or register."

ENDIF

END

2. View Placement Drives:

BEGIN

FETCH placement drives data from the database

DISPLAY placement drives to the student

PROVIDE options to sort and filter placement drives

END

3. Select and View Drive Details:

BEGIN

PROMPT student to select a placement drive

QUERY database for details of the selected drive

RETRIEVE and DISPLAY drive details

END

4. Check Eligibility Criteria:

BEGIN

CHECK if student meets eligibility criteria for the selected drive

IF eligible **THEN**

DISPLAY "Apply Now" option

ELSE

DISPLAY "You are not eligible for this drive."

ENDIF

END

5. Apply for Placement Drive:

BEGIN

IF student clicks "Apply Now" **THEN**

SAVE registration data to the drive registration table

DISPLAY "Registration successful."

ENDIFEND

Algorithm 3 View Result per Round

```
BEGIN
  FUNCTION viewResult():
    DISPLAY "Enter username and password"
    INPUT username, password
    // Verify login
    IF loginSuccessful(username, password) THEN
      NAVIGATE to "Result Section"
      DISPLAY "Fetching applied drives..."
      // Fetch applied drives
      appliedDrives = queryDatabaseForDrives(username)
      DISPLAY appliedDrives
      // Select drive for result
      DISPLAY "Select a drive to view results"
      INPUT selectedDrive
      // Fetch result for the selected drive
      resultData = queryDatabaseForResult(selectedDrive)
      DISPLAY resultData
    ELSE
      DISPLAY "Invalid login credentials. Try again."
    END IF
  END FUNCTION
END
```

Algorithm 4 Update Upcoming Drives

```
BEGIN
  FUNCTION updateUpcomingDrives():
    DISPLAY "Enter admin username and password"
    INPUT username, password
    // Verify admin login
    IF loginSuccessful(username, password) THEN
      DISPLAY "Login successful. Navigating to Admin Dashboard..."
      NAVIGATE to "Upload Drive Details Page"
      DISPLAY "Enter drive details"
      INPUT driveDetails
      // Verify entered details
      IF verifyDriveDetails(driveDetails) THEN
        SAVE driveDetails to placementDriveTable
        DISPLAY "Drive details successfully uploaded"
      ELSE
        DISPLAY "Error in entered details. Please correct and try again."
      END IF
    ELSE
      DISPLAY "Login failed. Invalid credentials."
    END IF
  END FUNCTION
END
```
