Department Training Automation System (DTAS)

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in partial fulfillment for the requirements of B.E Degree in Software Engineering.
June 2022

In the name of ALLAH, the Most benevolent, the Most Courteous

CERTIFICATE OF CORRECTNESS AND APPROVAL

This is to officially state that the thesis work contained in this report

"Department Training Automation System"

is carried out by

Rizwan Aslam, Nouman Aslam, Muhammad Ateeq, Muhammad Junaid, Sohaib Sadiq

under my supervision and that in my judgement, it is fully ample, in scope and excellence, for the degree of Bachelor of Software Engineering in Military College of Signals, National University of Sciences and Technology (NUST), Islamabad.

Approved by

Supervisor
Lec Ayesha Naseer

Date: ___________

DECLARATION OF ORIGINALITY

We hereby declare that no portion of work presented in this thesis has been submitted in support of another award or qualification in either this institute or anywhere else.

ACKNOWLEDGEMENTS

Allah Subhan'Wa'Tala is the sole guidance in all domains.

Our parents, colleagues and most of all supervisor, __________ without your guidance.

The group members, who through all adversities worked steadfastly.

Plagiarism Certificate (Turnitin Report)

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ABSTRACT

Department Training Automation System is a leading step in automating very much manual and tedious task of department. This provides a platform which has all the required information about instructors, schedule, final year project profiles, postgraduate profiles and status. Main purpose of this project is to provide a friendly access to its user, officer or any official of the college. Administer would be easily feeding there required data into the system and also easily fetch the required matching student details. This project has special admin dashboard which will be helpful in managing students and staff. System will provide any required information of any individual students and their progress in projects and thesis.

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Chapter 1: Introduction

The current system is computerized but it do not fulfill all the requirements that are needed by the Training Cell. So to overcome some of its limitations we are proposing this new system. In older system the data taken by the students is maintained automatically but to sort them according to the criteria has to be done manually. Manual sorting is a tedious job and can sometimes lead to inaccuracy. To make this laborious job simple and more accurate, the best way is atomization of the current environment. The main purpose of this application/project is developing an online application for the Training Department of the college. As it is an online application, so it can be accessed easily throughout the organization and outside as well. This system behaves as a central repository of all the student information. So this system can be used as an application for the TPO the college to manage the student information with regards to training.

1.1 Overview

Today's world is a world of digitalization. The growing tech field and exponential development in the fields of transport, medicine, metropolitan cities have become the most influential developments in the lives of mankind. In this era of computers it is most important to avoid the daily manual task and to automate it if possible. This step of automating the automation system will provide a new way and a new direction for the big enough process. This will make the process faster without any human error.

This web based automation system will provide better prospective for the enhancement of organization regarding to quality and transparency

1.2 Problem Statement

The term “automation” is generally considered to refer to the use of integrated computer and two major factors motivate business organizations to consider automated office systems. Communication systems to support administrative procedures in an office environment. The first is a critical need to improve the productivity of both clerical and managerial office employees. The second reason for interest in office automation is the increasing complexity of organizational decision making and information needs.

1.3 Proposed Solution:

The project is web-based application. The project is divided into different modulus and every module is different from next module. The list of modules is as under:

- Final Year Project
- UG Timetable generator
- Post Graduate TH forms
- SAS Advisory

1.4 Working Principle:

This project works on MERN stack principles. let’s cut the MERN stack into two blocks:

- Back-end
- Front-end.

1.4.1 Developing the back end with the MERN stack:

MongoDB, Node.js and Express are dedicated to developing the back end of web applications. This corresponds to database management, scripts, html documents, HTTP requests, etc. With the MERN stack, the developers create URLs, such as application / users / create. On these URLs, they then create, read and modify the data that is stored and retrieved in the MongoDB database.

These URLs represent functions, with HTTP calls as the originators. The data is sent via the requests and the server in return will be responsible for modifying the database and sending everything back in JSON format (a format that is very practical because it is readable by JavaScript, the language used by all the technologies making up the MERN stack).

1.4.2 Developing the front-end with the MERN stack

React's role is to execute HTTP requests. With React, developers make Ajax calls. This allows them to set up dynamic data downloads without the need for reloading the page. As a result, the web application is made to be much faster than average.

Ajax is interesting because it acts in an invisible way. The user has the impression that the data displayed has always been present, whereas thanks to Ajax, it has just been downloaded. When, for example, you write a comment at the bottom of an article on a site and the site does not reload, it's thanks to Ajax.

1.5 Objectives

1.5.1 General Objectives:

To continue in the development of computer systems, either by upgrading or by total replacement of existing systems, thus ensuring the utilization of the highest level of technology available.

1.5.2 Academic Objectives:

- Development of a smart administration System
- To implement our academic learning and techniques and simulate the results
- To increase productivity by working in a team

1.6 Scope

This project finds its scope wherever there is road, a nearby school and hospital. It is an innovating state of the art software integrated hardware prototype powered by machine learning and image processing techniques, providing a smart administrative tool to reduce the traffic congestion and prioritizing ambulances over normal traffic to save the sacred life inside it as its not only about saving a single life but the whole humanity.

1.7 Deliverables

1.7.1 Web application

Complete web application that provides admin area and dashboard with all four modules at live server where students and teachers can login and view and update grades and admin can generate timetable.

1.7.2 User Interface

Complete User interface will be available for deliverable

- Backend development:

  Backend with database will be deliverable.

Chapter 2: Literature Review

A new product is launched by modifying and enhancing the features of previously launched similar products. Literature review is an important step for development of an idea to a new product. Likewise, for the development of a product, and for its replacement, related to Department management system, a detailed study regarding all similar projects is compulsory. Our research is divided into the following points.

- Industrial Background
- Existing solutions and their drawbacks
- Research Papers

2.1 Industrial background

A management system is being used in every small to large departments in the world. It is much popular and everyone want to make things easy and secure so that they can grow smoothly. Hence need of these type of systems has been increased but they are should be fully secure and responsive.

Initially these systems were not very much common and everything was working in old manners across the Pakistan but nowadays as we are directly connected with other part of the world as well and we need efficient system in order to grow and meet international requirements .

This system will ease things and will be helpful to automate manual things. ‘

2.2 Existing solutions and their drawbacks

There are many different solutions available but no solution fits exactly what we needed with this system. Every system fits in some way and does not fit in other way

Some of those existing solutions are as follows

- Management and information System
- Time table management system
- University management System

2.2.1 Management and information System

Management and information system is very useful in managing students, but it does not contain all of modules like Final year project management, Time table management and other modules as well.

Moreover, this software is using old technologies which is big issue as it may not be so effective.

2.2.2 Time table management System

This software is being used for generating the timetable. This may be used for some departments in the universities, but it is not useful for our requirements.

This timetable system does not store generated timetable in the database, but we need to store generated timetable in the database for long term.

Also, this timetable does not fit for our university schedule and rules.

SO this will not be much effective

2.2.3 University management System

Present system is time consuming and results in lack of getting ineffective results. Sometimes it takes lot of time and may lose information as well. Sometime if we make any kind of mistake it leads to collapse the system

Chapter 3: Requirements

3.1 Introduction:

This chapter gives full description of the Department Training Automation System. It will explain the purpose, features, interfaces, functionality, entire process, constraints and the application's reaction to external stimuli. It is intended for stakeholders and the system developers

3.2 Functional Requirements:

Register:

The user will be directed to the page for registration. More details in the next section.

Login:

This link will take the users to the page where they will be asked to log in. More details in the next section.

Profile:

After logging into the application, the user can view his/her profile. Details are provided in the next section

Log Out:

The user can log out from the application by clicking this button present in the top navigation bar and would be redirected to the home page. Also, the user will be automatically logged out from the application after six hours of login.

Add Subjects:

On the left side of the page, which will appear after login, there is a navigation pane. Choose 'Add Subjects' link to input the data related to the subjects. Now on the right side of the page, there are two radio buttons. If you want to add theory lectures, e.g Physics, then select 'Add

Theory Subject' radio button and click 'Add' button. Else if you want to add a lab subject then select 'Add Lab' radio button, provide the name of the lab appended by the 'Lab' word, e.g: Physics Lab, and also provide the number of such labs, e.g. number of physics lab in the school is 2, then click 'Add' button. After submitting the values the input fields will be reset and you need to add another subject or lab in the same way.

Delete Subjects:

On the Add subject page, you can view the list of subjects added and on the right of every subject name, there is a delete button. Click on the button and that subject would be deleted

Add Teachers:

If you want to add the name of teachers, then simply click the 'Add Teachers' link on the left side navigation pane and then enter the name of the teacher and click'Add' button. After that, the input field will be reset and continue adding in thesame way. If there is more than one teacher of the same name, then no need to enter the same name again.

Delete Teachers:

On the Add Teachers page, you can view the list of teachers added and on theright of every teacher name, there is a delete button. Click on the button and that teacher name would be deleted.

Add ClassSection:

If you want to add class and section then click the 'ClassSection' link on the left side of the navigation pane and then you can fill in the necessary values in the input field on the right side.

Delete ClassSection:

On the Add ClassSection page, you can view the list of ClassSection added andon the right of every ClassSection name, there is a delete button. Click on the button and that value would be deleted.

Add Slots

After filling in the data separately you can now make the sets of the teacher, subject classSection and the number of lectures for that particular set. Eg, in the classSection 5A teacher XYZ teaches Physics subject and the number of lectures per week taken by him is 4, then you need to select the name of the teacher, subject name and classSection from the dropdown list and input the number of the lectures. After this, you need to click ‘Add’ button and the values of the fields

will be reset. You need to do this for all the sets. You need to provide the number of periods for all the classes for each day. For e.g, Tuesday is half-day for all the classes, the number of periods on Tuesday should be 4.

Delete Slots

On the Add Slots page, you can view the slot details added and on the right of every slot, there is a delete button. Click on the button and that slot would be deleted.

Generate TimeTable

After entering all the relevant slot details, the user can click on the Generate TimeTable button present on the bottom right of the add slots page.

3.2 Other Nonfunctional Requirements

Performance Requirements

PR-1: Response time: The data system shall show no visible deterioration in response time as the number of persons increases. Response times seen by end users for querying metadata should be on the order of a few seconds or less. Response times seen by end users for retrieving the actual images may take much longer, anywhere from a few minutes to several hours. If the user requests a large image with a short response time, it is acceptable for the ARS data system to advise the user that the target response time cannot be met. In that case, the person would be referred to an alternate method of getting the data.

PR-2: Loading speed: The data system shall load as quickly as comparable productivity tools on whatever environment it is running in.

Safety Requirements

Data on the server should be protected from power loss but data in transit from server to requester could be lost. Given that these data will also remain on the watershed site system, rather than expend resources to prevent this loss, such failures will be monitored and the uploading process will be repeated.

Security Requirements

Security requirements will have four primary components. They are authentication, confidentiality, integrity, and availability.

SCR-1: Authentication: We will follow industry best practices for authentication, using single-sign-on systems like Microsoft Active Directory to perform authentication. Authentication addresses security requirements to ensure those using system are who they say they are.

SCR-2: Confidentiality: Confidentiality security requirements describe the need to protect the data appropriately. Any data that should be viewed by a restricted audience must be protected with appropriate security features.

SCR-3: Data Integrity Extensive data validation and review will be performed both before data are uploaded to the system and as part of the upload process. The system will need policy and procedures protecting the data from intentional or unintentional modifications, and to ensure accurate data are made available.

SCR-4: Availability The fourth consideration for security requirements is availability. The system must be available to the intended audience 24 hours per day, 7 days a week with, 99% availability and a tolerance of -5% (not less than 50% of working hours in any week).

3.3 Software Quality Attributes

Usability

The usability of system lies on the effectiveness and ease-of-use of a system. The main function of Department Training Automation System (DTAS) is to assist university staff to manage students' records. A student record embodies in various and numerous courses management, finance, examination, accommodation and other essential information.So will make a user friendly application so that every user can use it easily.

Legal

The Department Training Automation System should follow privacy policy strictly.

Reliability

Our system is mostly depending on database. As a result, the reliability of our project highly depends on the database. The system **will not expected to handle any kind of failure except if any case of severe attack on system.**

Ease of Use

By understanding the user manual, it will be very easy to use it.

Chapter 4: Design

Introduction:

This sections covers all the functional requirements and demonstrates how they interrelate with each other abstractly. The low-level design also illustrates how all of these requirements have been implemented. This low level design does not address any non- functional requirements that the system has and that has been mentioned in the SRS Document.

Use Case:

FYP Management:

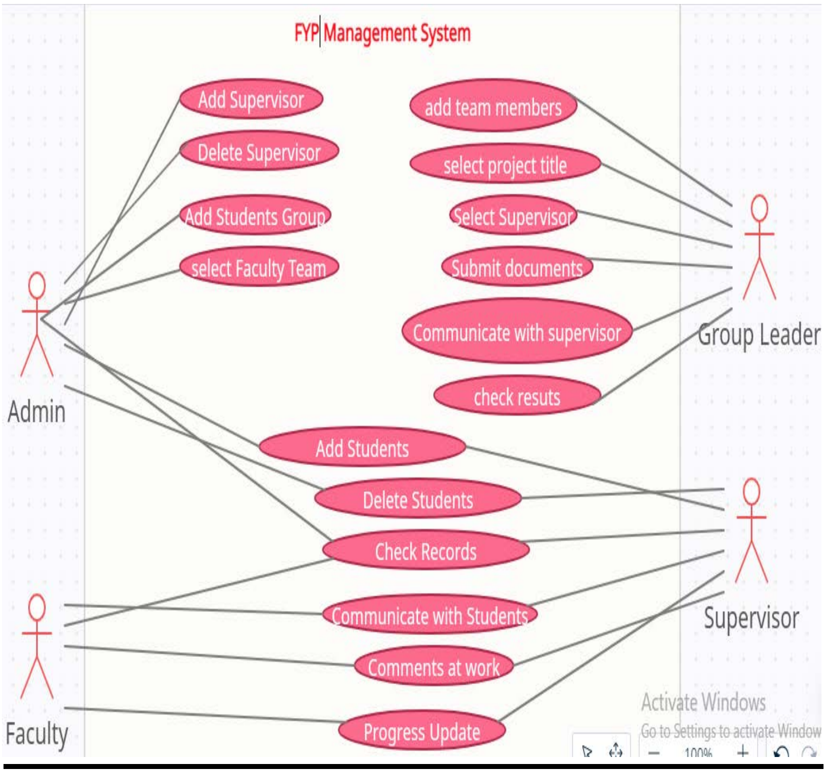


Figure 1a: Use Case for FYP Module

SAS Advisor:

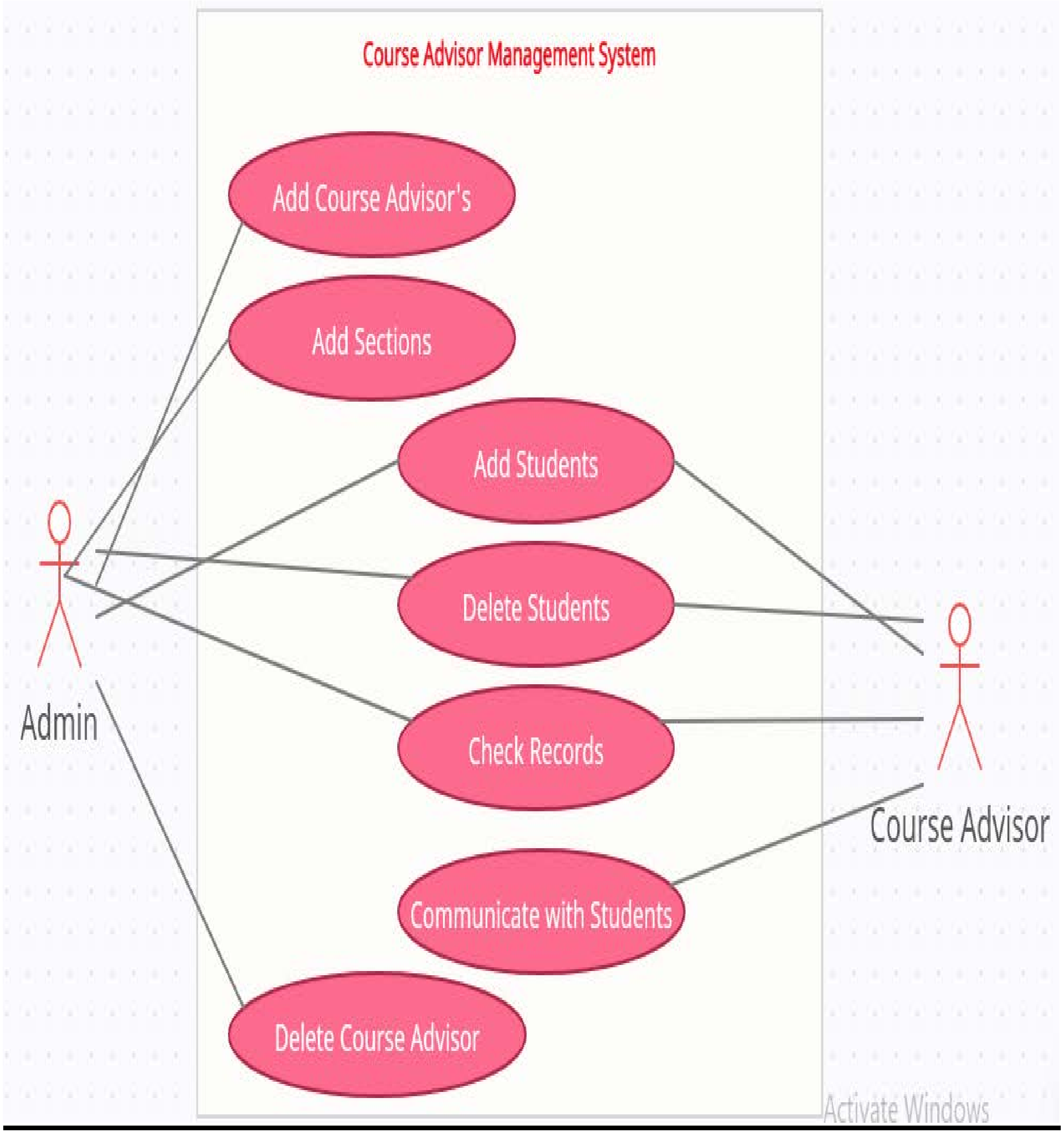


Figure 1b: SAS Advisory

Timetable Automation:

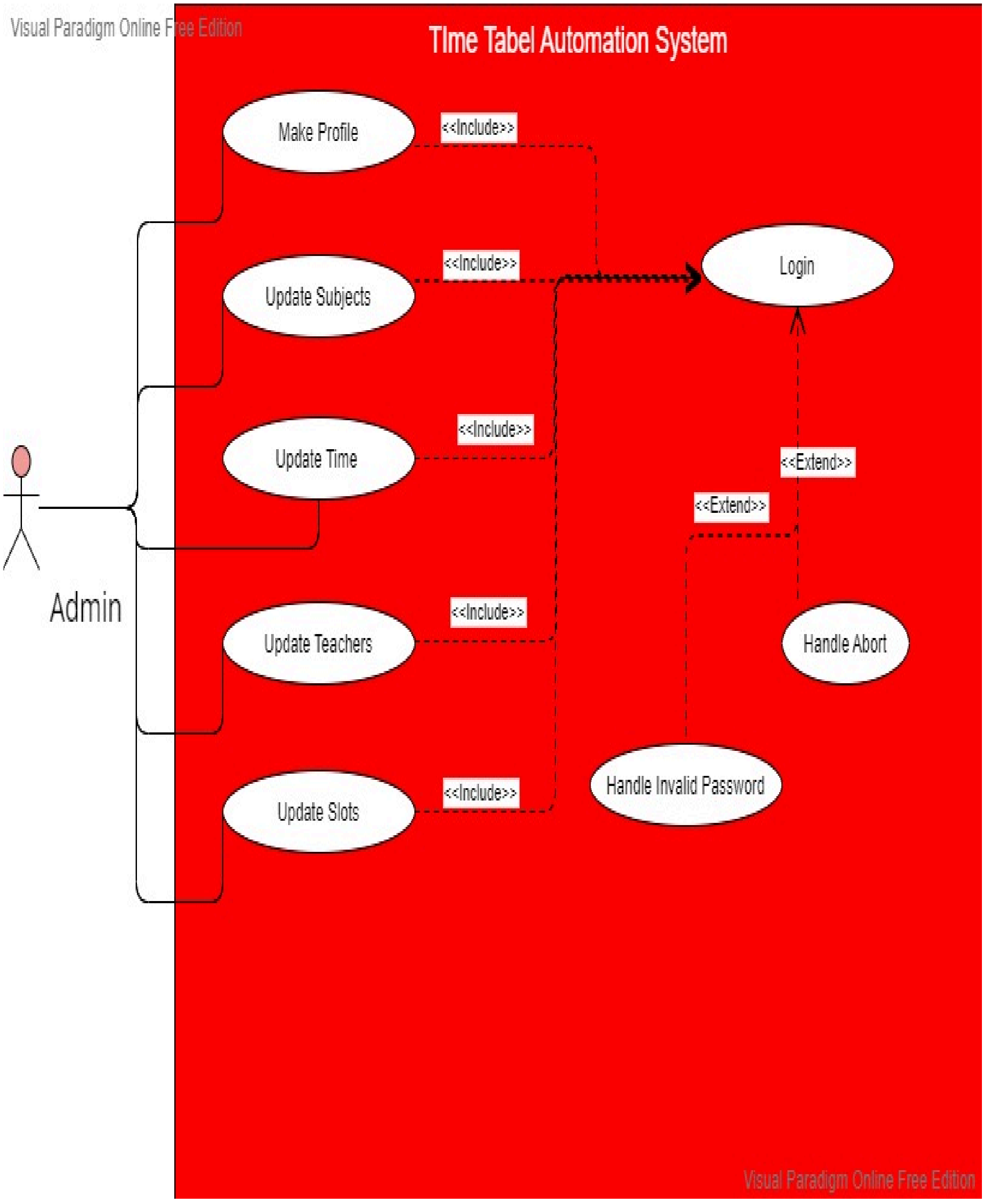


Figure 1c: Timetable Automation

PG TH Form Automation

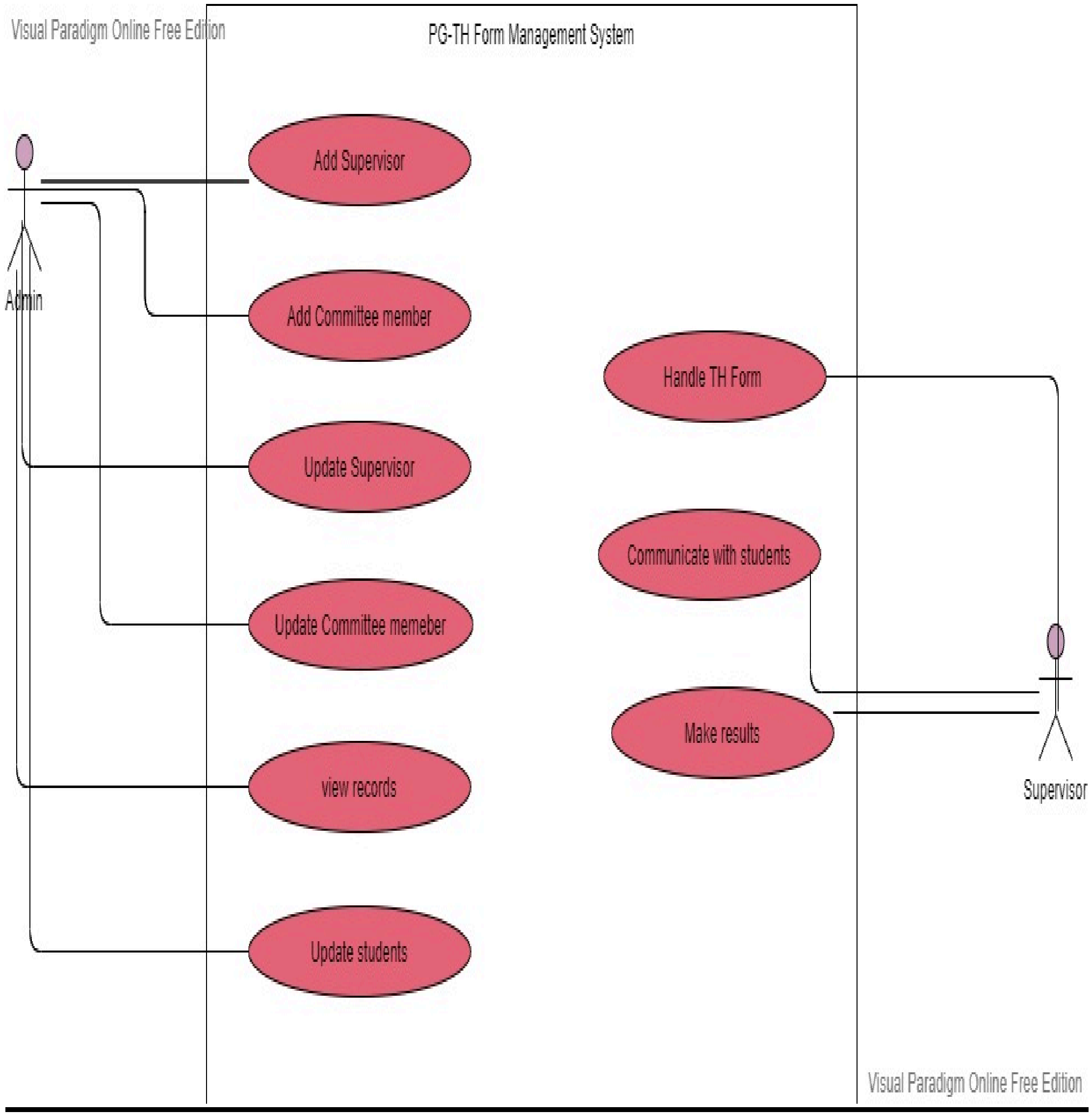


Figure 1d: PG TH Form Automation

Use Case Descriptions

Use Case ID	1		
Use Case Name	Login		
Actors:	Admin, Students, Faculty		
Created by:	Ateeq	Last Updated By	Ateeq
Date Created:	24/02/2022	Date Last Update	24/05/2022
Description	A users tries to login to the system.		
Preconditions:	User has to open the login page first.User must be registered before trying to login into system		
Post Conditions:	If the use case was successful , the actor is now logged into the system. If not, the system state remain unchanged. If user is not registered ,it will redirect to register page		
Normal Flow (Primary Scenario)	1. The framework demands the on-screen character to enter his/her email . 2. The on-screen character enter his/her password. 3. The framework matches the entered email and password with already registered data and logs the on-screen character into the framework.		
Alternative Flows:	In the event that in the Basic Flow; the on-screen character enters an invalid email or password,it will show an error message and user may try again ,reset password or move to register page so that user can register and then login.		

Use Case ID	2		
Use Case Name	Log out		
Actors:	Admin, Students, Faculty		
Created by:	Ateeq	Last Updated By	Ateeq
Date Created:	24/02/2022	Date Last Update	24/05/2022
Description	A users tries to logout to the system.		
Preconditions:	User must be logged in and time slot should not expire.		
Post Conditions:	If the use case was successful , the actor is now logged out and will redirect to homepage ,if it unsuccessful it will show error message.		
Normal Flow (Primary Scenario)	1. The framework demands the on-screen character to press logout button and it will be logged out. .		
Alternative Flows:	In the event that in the Basic Flow; the on-screen character may have data problem or any other issue and it will show an error message.		

Use Case ID	3			
Use Case Name	Register			
Actors:	Admin, Students, Faculty			
Created by:	Ateeq	Last Updated By	Ateeq	
Date Created:	24/02/2022	Date Last Update	24/05/2022	
Description	A users tries to Register into the system.			
Preconditions:	User has to open the register page.			
Post Conditions:	If the use case was successful , the actor is now registered successfuly and will be redirected to login page and will store new user in database. If there is any issue,it will show an error message			
Normal Flow (Primary Scenario)	1. The framework demands the on-screen character to enter username,email,password and confirm password. 2. Confirm password and password must match 3. Email should be unique 4. User will be resgistered successfully.			
Alternative Flows:	In the event that in the Basic Flow; the on-screen character enters a password that does not match with confirm password or email is not uniques, this will present an error message in the form of alert.			

Use Case ID	4		
Use Case Name	Profile		
Actors:	Admin, Students, Faculty		
Created by:	Ateeq	Last Updated By	Ateeq
Date Created:	24/02/2022	Date Last Update	24/05/2022
Description	A users creates his/her profile.		
Preconditions:	User must be logged in first.		
Post Conditions:	User may have updated the profile picture,username and even password		
Normal Flow (Primary Scenario)	1. The framework demands the on-screen character to click at create profile. 2. User may upload profile pictures and update username and password		
Alternative Flows:	In the event that in the Basic Flow; the on-screen character enters a profile picture of irrelavant image type or with wrong image file size It will show an error message .		

Use Case ID	5		
Use Case Name	Add Subjects		
Actors:	Admin		
Created by:	Ateeq	Last Updated By	Ateeq
Date Created:	24/02/2022	Date Last Update	24/05/2022
Description	Admin tries to enter subject name for timetable generation		
Preconditions:	User role must be admin		
Post Conditions:	If the use case was successful , then subject name will be added,but if there is any duplicate name it will show an error message.		
Normal Flow (Primary Scenario)	1. The framework demands the on-screen character to enter subject name . 2. Subject name will be added in the database.		
Alternative Flows:	In the event that in the Basic Flow; the on-screen characte enters duplicate subject name or there is error from backend,it will represent an error message on the screen.		

Use Case ID	6			
Use Case Name	Delete Subjects			
Actors:	Admin			
Created by:	Ateeq	Last Updated By	Ateeq	
Date Created:	24/02/2022	Date Last Update	24/05/2022	
Description	Admin tries to delete subject name for timetable generation			
Preconditions:	User role must be admin and he should open add subject page.			
Post Conditions:	If the use case was successful , then subject name will be deleted.And if there is any issue it will shwo an error message.			
Normal Flow (Primary Scenario)	3. The framework demands the on-screen character to press delete button in order to delete subject . 4. Subject name will be deleted from the database.			
Alternative Flows:	In the event that in the Basic Flow; the on-screen there is error from backend,it will represent an error message on the screen.			

<table>
<tr><td>Use Case ID</td><td colspan="3">7</td></tr>
<tr><td>Use Case Name</td><td colspan="3">Add Teachers</td></tr>
<tr><td>Actors:</td><td colspan="3">Admin</td></tr>
<tr><td>Created by:</td><td>Ateeq</td><td>Last Updated By</td><td>Ateeq</td></tr>
<tr><td>Date Created:</td><td>24/02/2022</td><td>Date Last Update</td><td>24/05/2022</td></tr>
<tr><td>Description</td><td colspan="3">Admin tries to enter Teacher name for timetable generation</td></tr>
<tr><td>Preconditions:</td><td colspan="3">User role must be admin and should open add teachers page</td></tr>
<tr><td>Post Conditions:</td><td colspan="3">If the use case was successful , then Teacher name will be added,but if there is any duplicate name it will show an error message.</td></tr>
<tr><td>Normal Flow (Primary Scenario)</td><td colspan="3">1The framework demands the on-screen character to enter Teacher name .
2 Teacher name will be added in the database</td></tr>
<tr><td>Alternative Flows:</td><td colspan="3">In the event that in the Basic Flow; the on-screen characte enters duplicate Teacher name or there is error from backend,it will represent an error message on the screen.</td></tr>
</table>

Use Case ID	8			
Use Case Name	Delete Teachers			
Actors:	Admin			
Created by:	Ateeq	Last Updated By	Ateeq	
Date Created:	24/02/2022	Date Last Update	24/05/2022	
Description	Admin tries to delete Teacher name for timetable generation			
Preconditions:	User role must be admin and should be at add teachers page.			
Post Conditions:	If the use case was successful , then Teacher name will be deleted.And if there is any issue it will shwo an error message.			
Normal Flow (Primary Scenario)	1. The framework demands the on-screen character to press delete button in order to delete Teacher . 2 .Teacher name will be deleted from the database.			
Alternative Flows:	In the event that in the Basic Flow; the on-screen there is error from backend,it will represent an error message on the screen.			

<table>
<tr><td>Use Case ID</td><td colspan="3">9</td></tr>
<tr><td>Use Case Name</td><td colspan="3">Add Class/Section</td></tr>
<tr><td>Actors:</td><td colspan="3">Admin</td></tr>
<tr><td>Created by:</td><td>Ateeq</td><td>Last Updated By</td><td>Ateeq</td></tr>
<tr><td>Date Created:</td><td>24/02/2022</td><td>Date Last Update</td><td>24/05/2022</td></tr>
<tr><td>Description</td><td colspan="3">Admin tries to enter class/sectoin for timetable generation</td></tr>
<tr><td>Preconditions:</td><td colspan="3">User role must be admin and should open add class/section page</td></tr>
<tr><td>Post Conditions:</td><td colspan="3">If the use case was successful , then class/section will be added,but if there is any duplicate name it will show an error message.</td></tr>
<tr><td>Normal Flow
(Primary Scenario)</td><td colspan="3">1. The framework demands the on-screen character to enter class/section name .
2. class/section name will be added in the database</td></tr>
<tr><td>Alternative Flows:</td><td colspan="3">In the event that in the Basic Flow; the on-screen characte enters duplicate class/section name or there is error from backend,it will represent an error message on the screen.</td></tr>
</table>

Use Case ID	10		
Use Case Name	Delete Class Section		
Actors:	Admin		
Created by:	Ateeq	Last Updated By	Ateeq
Date Created:	24/02/2022	Date Last Update	24/05/2022
Description	Admin tries to delete class/section name for timetable generation		
Preconditions:	User role must be admin and should open add class/section page		
Post Conditions:	If the use case was successful , then class/section name will be deleted.And if there is any issue it will shwo an error message.		
Normal Flow (Primary Scenario)	1. The framework demands the on-screen character to press delete button in order to delete class/section . 2 .class/section name will be deleted from the database.		
Alternative Flows:	In the event that in the Basic Flow; the on-screen there is error from backend,it will represent an error message on the screen.		

Use Case ID	11		
Use Case Name	Add Slots		
Actors:	Admin		
Created by:	Ateeq	Last Updated By	Ateeq
Date Created:	24/02/2022	Date Last Update	24/05/2022
Description	Admin tries to enter Slots for timetable generation		
Preconditions:	User role must be admin and should open add Slot page		
Post Conditions:	If the use case was successful , then Slot will be added,but if there is any duplicate name it will show an error message.		
Normal Flow (Primary Scenario)	1 The framework demands the on-screen character to enter slot name . 2. slot name will be added in the database		
Alternative Flows:	In the event that in the Basic Flow; the on-screen characte enters duplicate slot name or there is error from backend,it will represent an error message on the screen.		

<table>
<tr><td>Use Case ID</td><td colspan="3">12</td></tr>
<tr><td>Use Case Name</td><td colspan="3">Delete Slots</td></tr>
<tr><td>Actors:</td><td colspan="3">Admin</td></tr>
<tr><td>Created by:</td><td>Ateeq</td><td>Last Updated By</td><td>Ateeq</td></tr>
<tr><td>Date Created:</td><td>24/02/2022</td><td>Date Last Update</td><td>24/05/2022</td></tr>
<tr><td>Description</td><td colspan="3">Admin tries to delete slot name for timetable generation</td></tr>
<tr><td>Preconditions:</td><td colspan="3">User role must be admin and should open add slot page</td></tr>
<tr><td>Post Conditions:</td><td colspan="3">If the use case was successful , then slot name will be deleted.And if there is any issue it will shwo an error message.</td></tr>
<tr><td>Normal Flow
(Primary Scenario)</td><td colspan="3">1 The framework demands the on-screen character to press delete button in order to delete slot .
2 .slot name will be deleted from the database.</td></tr>
<tr><td>Alternative Flows:</td><td colspan="3">In the event that in the Basic Flow; the on-screen there is error from backend,it will represent an error message on the screen.</td></tr>
</table>

Use Case ID	13		
Use Case Name	Generate TimeTable		
Actors:	Admin		
Created by:	Ateeq	Last Updated By	Ateeq
Date Created:	24/02/2022	Date Last Update	24/05/2022
Description	A users tries to generate time table using inputs like subjects,class,slots and teachers		
Preconditions:	User role is admin. Teachers ,subjects ,slots and class sections are added and user is at timetable page		
Post Conditions:	If the use case was successful , time table will be generated at new page		
Normal Flow (Primary Scenario)	1. Admin will select teacher ,section,slot and subject from loaded data 2. Admin will click at button generate timetable and it will be generated.		
Alternative Flows:	In the event that in the Basic Flow; if data inserted is invalid or there is any backend issue, then an error message will be displayed		

Use Case ID	14		
Use Case Name	Create group/ add Student		
Actors:	Admin		
Created by:	Ateeq	Last Updated By	Ateeq
Date Created:	24/02/2022	Date Last Update	24/05/2022
Description	Admin will create fyp group and student data		
Preconditions:	Admin must be logged in and should be at required pages		
Post Conditions:	If the use case was successful , group and student data will be created		
Normal Flow (Primary Scenario)	1. Add required data for students 2. Click at button to create groups		
Alternative Flows:	In the event that in the Basic Flow; if data inserted is invalid or there is any backend issue, then an error message will be displayed		

Use Case ID	15			
Use Case Name	Delete group/ delete student			
Actors:	Admin			
Created by:	Ateeq	Last Updated By	Ateeq	
Date Created:	24/02/2022	Date Last Update	24/05/2022	
Description	Admin can delete student or group as well			
Preconditions:	User role is admin. And admin is at student pages			
Post Conditions:	If the use case was successful ,then group will be deleted			
Normal Flow (Primary Scenario)	1. Select group that need to delete 2. Delete it by clicking relevant button			
Alternative Flows:	In the event that in the Basic Flow; if data inserted is invalid or there is any backend issue, then an error message will be displayed			

Use Case ID	16		
Use Case Name	Grading students		
Actors:	Facutly		
Created by:	Ateeq	Last Updated By	Ateeq
Date Created:	24/02/2022	Date Last Update	24/05/2022
Description	Faculty can add marks and update marks or performance of students and groups		
Preconditions:	User role must be faculty,there must be some students under faculty		
Post Conditions:	If the use case was successful , Marks or performance will be updated		
Normal Flow (Primary Scenario)	1. Faculty will fill grading form and will submit		
Alternative Flows:	In the event that in the Basic Flow; if data inserted is invalid or there is any backend issue, then an error message will be displayed		

Class Diagram:

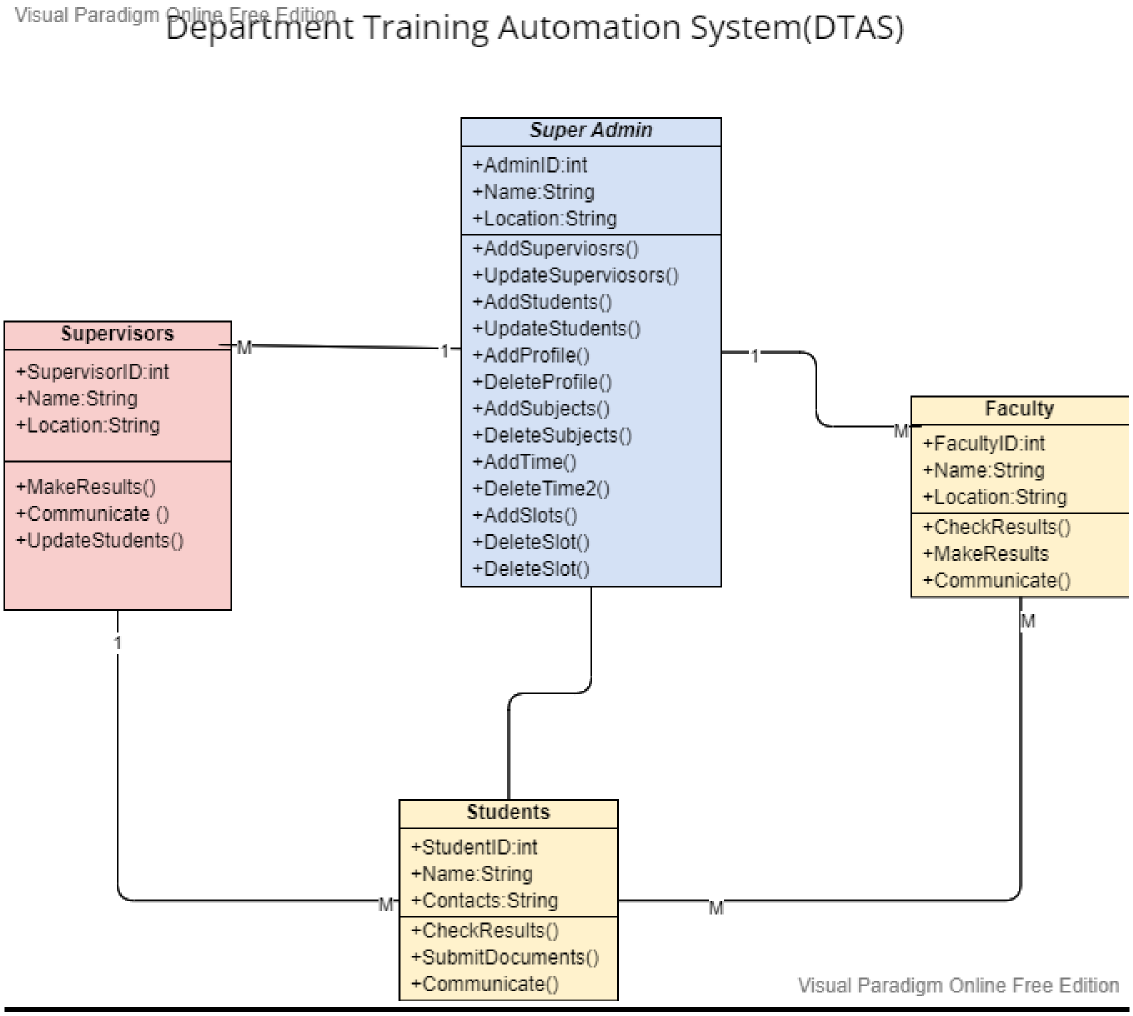


Figure 2: Class Diagram

Activity Diagrams

Admin:

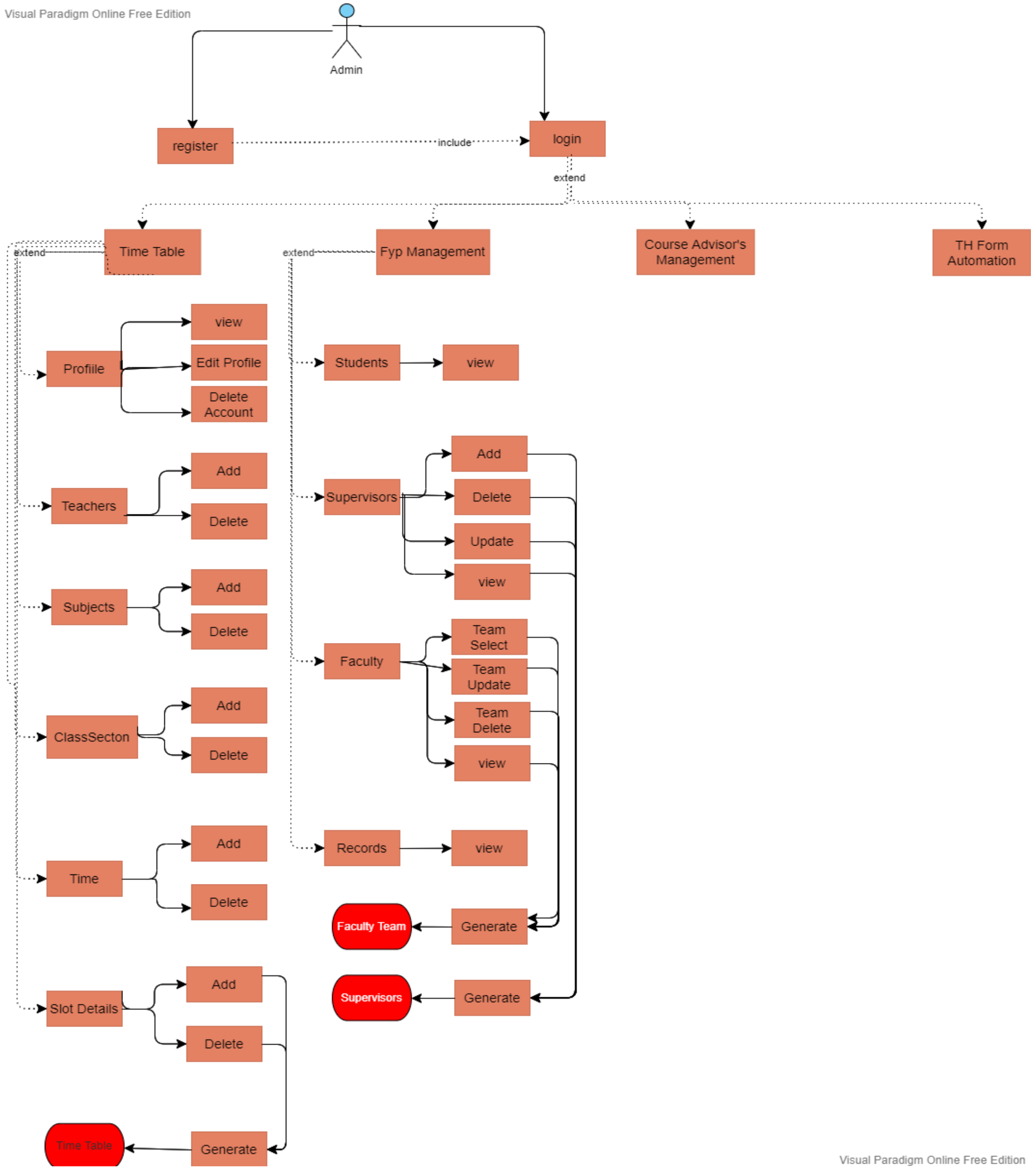


Figure 3A : Admin Activity Diagram

Student:

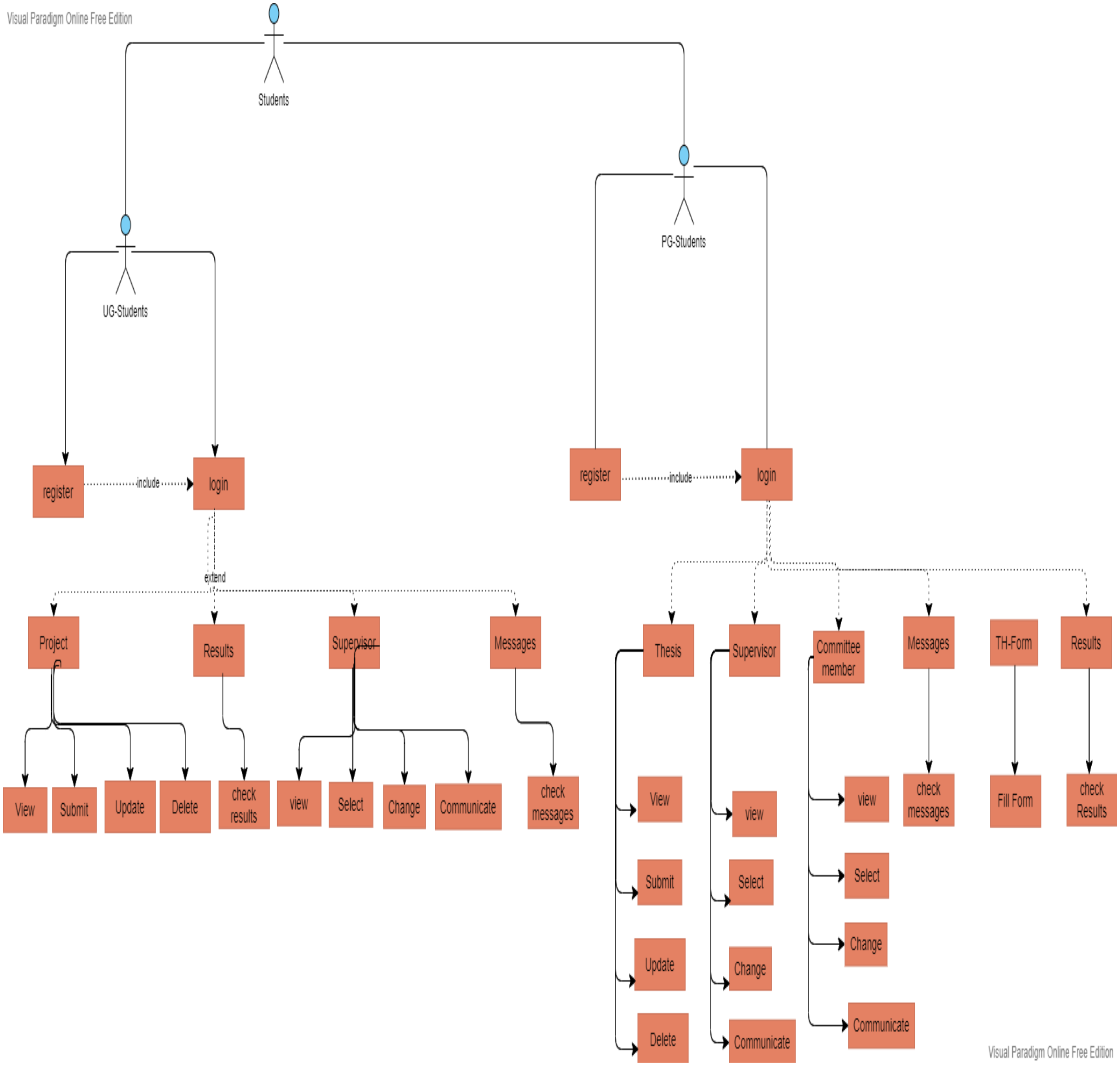


Figure 3b:Student Activity

Faculity:

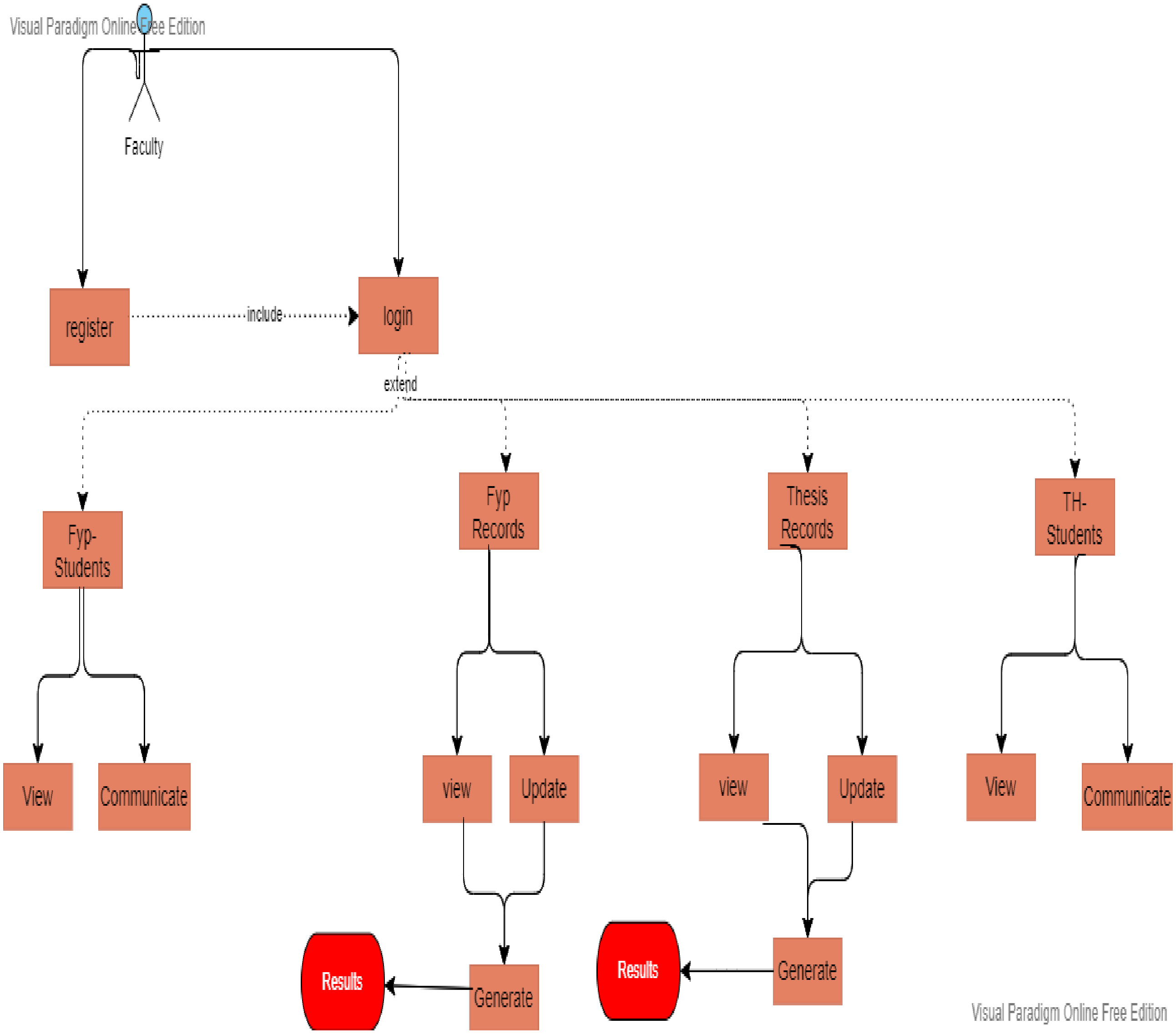


Figure 3D: Faculty Activity

Supervisor:

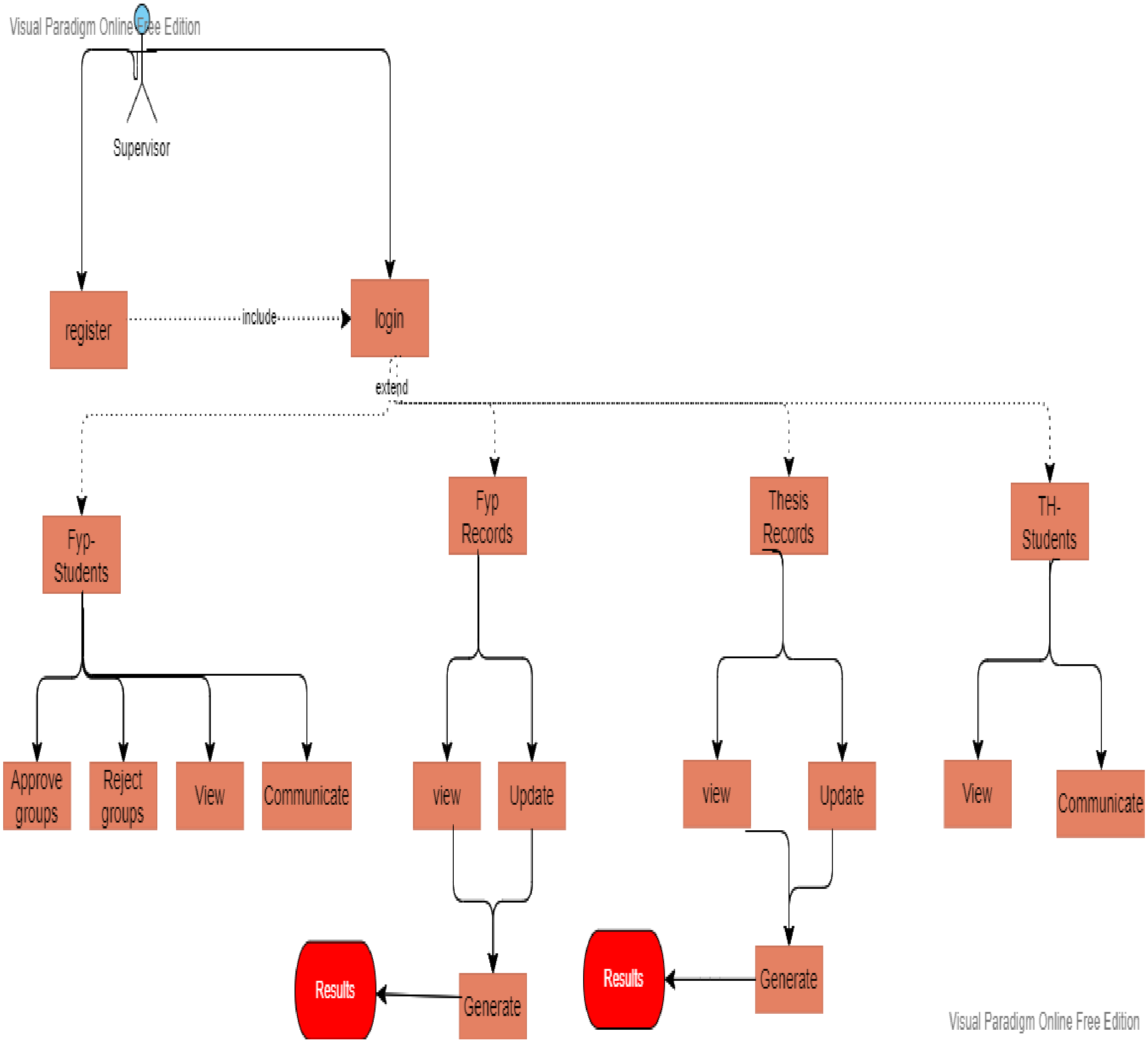


Figure 3E: Supervisor Activity Diagram

Chapter 5: Implementation

Introduction

Preceding chapter discoursed comprehensive design of the DTAS. This design is converted into an application by utilizing numerous technologies and tools. The implementation details are conferred in the subsequent divisions providing minutiae of the system's inner functioning.

5.1 Login/Signup

Login and signup is necessary part of every application and software so that system can restrict users from some part of the Software.

Without this feature system will not behave properly as system cannot detect which user role is doing which thing.

That's why there is login and register feature which will make sure the security of system.

5.1.1 Admin/Instructor login/signup

This login and registration is very important as admin role can do any kind of changes in the sytem,

Admin have right to add users,delete users and have roles upgrading each and everything .

So in this Application we have used jwtToken to make sure security of system is not comproised.

Token has the time limit after that limit it will expire .

Below is UI in order to show login and signup screen.

Figure 4a: Register

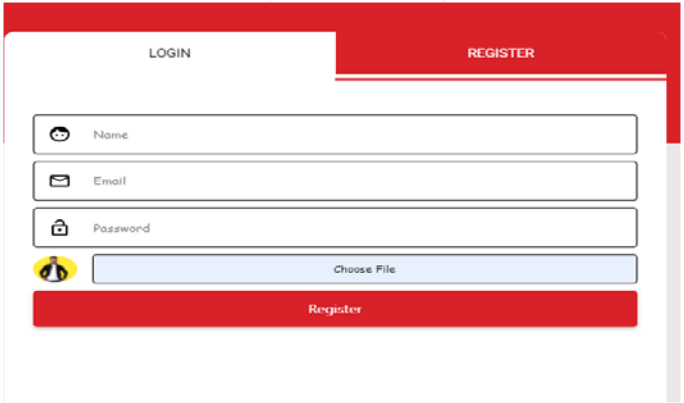
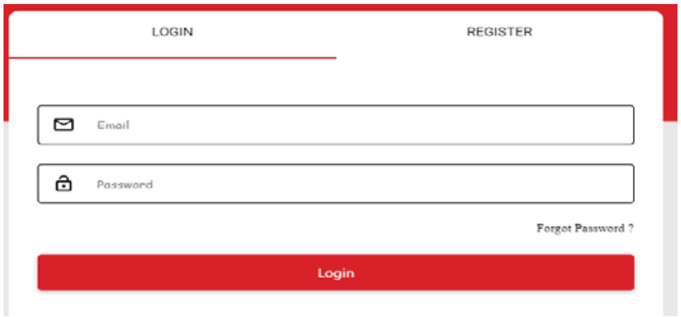


Figure 4b: Login



Instrcutor can register and login ,after successful registrion he/she will have record of their relavant students.

5.2 FYP module

5.2.1 Creating FYP groups by admin

Final year project management module will be helpful in managing students groups and their progress by their supervisors and FYP manager.

Admin will be able to create FYP groups after receivng group information from students.

Supervisor will be chosen as per students details and then groups will be created and assigned to relevant supervisors.

Screenshot is attached below:

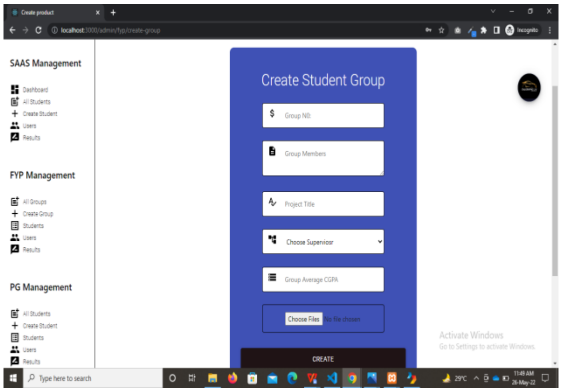
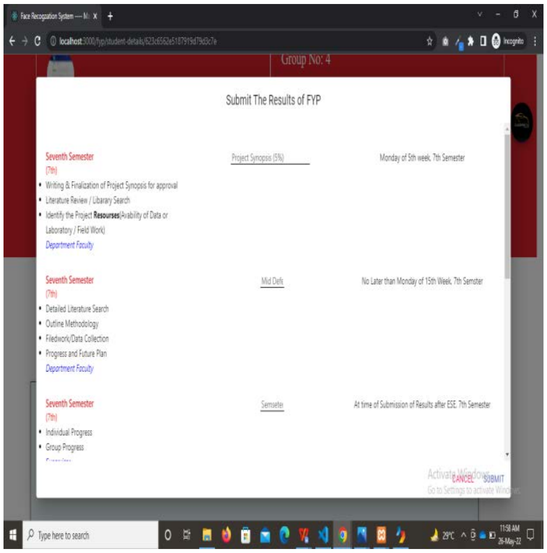


Figure 4c: Creating FYP groups by admin

5.2.2 Grading groups by Supervisor

Supervisors will have relevant group of students and they can update grades within time frame. They will add marks after each semester and after each presentation and final marks can be share admin.


Face Recognzation System — M
localhost:3000/fyp/student-details/623c6562e5187919d79d3c7e
Incognito
Group No: 4

Submit The Results of FYP

Seventh Semester
(7th)

- Writing & Finalization of Project Synopsis for approval
- Literature Review / Libarary Search
- Identify the Project **Resourses**(Avability of Data or Laboratory / Field Work)

Department Faculty

Project Synopsis (5%)

Monday of 5th week, 7th Semester

Seventh Semester
(7th)

- Detailed Literature Search
- Outline Methodology
- Filedwork/Data Collection
- Progress and Future Plan

Department Faculty

Mid Defe

No Later than Monday of 15th Week, 7th Semster

Seventh Semester
(7th)

- Individual Progress
- Group Progress

Semsete

At time of Submission of Results after ESE, 7th Semester

Figure 4d: Grading groups by Supervisor

5.3 Time-Table generation

Time table generation is one of most important modules .Creating timetable within department is very difficult to manage manually so this module will overcome difficulty and will smoothly generate time table.

5.3.1 Adding Class Section:

There are some inputs in order to generate suitable timetable. One of these inputs is to add class section for which we are generating timetable.

Admin will be able to add class section, delete class section and can update classs section

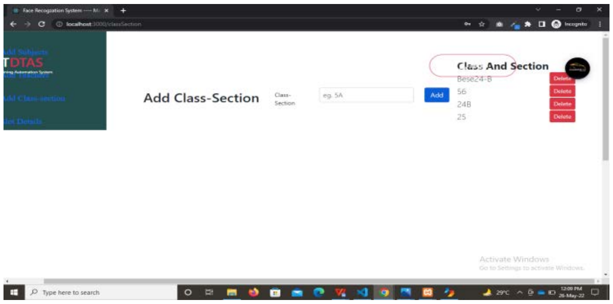


Figure 4e: Adding Class Section

5.3.2 Subjects, Teachers and days:

There are some more inputs like adding teachers ,subjects and working days **.**There will be no duplicate teacher name and subject name.

Admin will be able to delete and update these inputs as well and finally using all these inputs a random timetable will be generated.

5.4 SAAS management:

This module will be used to manage student and advisors. The course advisor will have details of their relevant students and they will note down performance over the time and will update it regularly

5.4.1 Adding students

At first step admin will add all students and course advisor and system will be responsible to add those students for relavant course advisor. Then those advisor will be connecting with their students but admin can add or delete any student a time

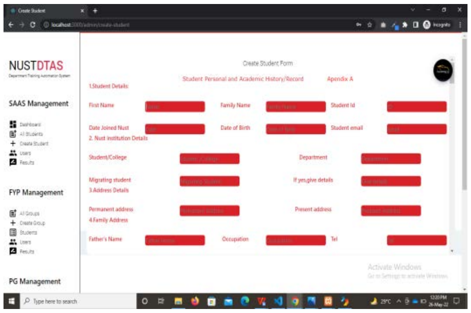


Figure 4f: Adding students

5.4.2 Updating student progress

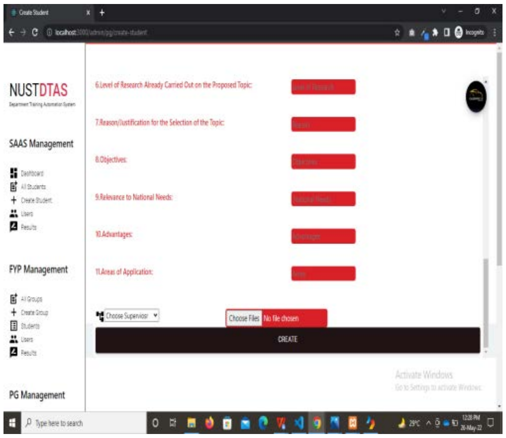
Course advisor will fill a form within a span of time and their performance reports will be generated in this way

5.5 PG students TH form automation:

This module is useful in managing post graduate students thesis reports and their TH forms

5.5.1 Adding students to supervisor

At first step admin will add all students and supervisor and system will be responsible to add those students for relavant Supervisor. Then those supervisors will be connecting with their students but admin can add or delete any student a time



6.Level of Research Already Carried Out on the Proposed Topic:

7.Reason/Justification for the Selection of the Topic:

8.Objectives:

9.Relevance to National Needs:

10.Advantages:

11.Areas of Application:

Figure 4g: Adding students to supervisor

5.5.2 Updating TH form progress of each student

There are two forms TH3 and TH4 that will be filled by supervisor of relavant student and grading will be done eventually

Chapter 6: Testing

Introduction:

The purpose of this chapter is to elicit all material that is essential to plan and control the test efforts for the development of this project. It specifies the test plan for DTAS application during the development phase and provides a rationale behind the necessity of these tests. This report gives an outline of the tests which were implemented, the items that were targeted by the tests, along with the testing approach that was deployed. This testing is being done according to the elicited requirements in Software Requirements Specification Documents for DTAS.

6.1 Access to Dept. Training Automation System:

The main objective of this project is to produce an automatic system that will help dept. to manage all activities automatically. Management thinking is moving towards an understanding of human action as a process of sense making. What an organization becomes emerges from the sense-making relationships of its members, rather than being determined by the choices of a few powerful individuals. Management has historically been seen as a collection of tasks involving planning, organizing, controlling and incentivizing. A competent manager is believed to be able to analyze organizational and task requirements and also the emotionally loaded human motivations. Successful management has then been able to remove conflict and uncertainty and accurately predict and plan the future. In future there must be some AI addition so that system can move towards complete automation.

TEST CASES

Test Case Name	Application Startup Testing
Test Case ID	1
Description	This features sends the user to the login screen of the web application when he/she enters the website / in the browser.
Testing Technique Used	Black Box Testing
Preconditions	The computer is on and is connected to the internet, and a web browser is running
Input Values	URL:
Valid Inputs	The specified URL address
Invalid Inputs	Numeric Input, any mistake in Specified URL
Steps	1. Enter URL in the browser 2. Press Enter
Expected Output	The user will be sent to the login screen of System
Actual Output	Successful opening of the application
Status	Pass

Test Case Name	Login
Test Case ID	2
Description	This features sends the user to the dashboard screen of the web application when he/she successfully login to system.
Testing Technique Used	Black Box Testing
Preconditions	The user is registered to the website
Input Values	URL: Email password
Valid Inputs	The specified URL address Email matches with password
Invalid Inputs	Email mistake or wrong password
Steps	1. Enter URL in the browser 2. Press Enter 3. Enter required input values 4. Press button to login
Expected Output	1. Success notification will be shown 2. User will be redirected to dashboard/profile page
Actual Output	Successful opening of dashboard page
Status	Pass

Test Case Name	Logout
Test Case ID	3
Description	This feature will clear cookies and will expire login session of user and user will be redirected to home page
Testing Technique Used	Black Box Testing
Preconditions	The user is logged in
Input Values	URL: Logout button command
Valid Inputs	Logout command
Invalid Inputs	Nil
Steps	1. Press logout on the screen of website
Expected Output	The user will be sent to the Home page
Actual Output	Successful expiry of login session
Status	Pass

Test Case Name	Register
Test Case ID	4
Description	This features sends the user to the Register page
Testing Technique Used	Black Box Testing
Preconditions	User is at Register page
Input Values	Username Email Password Confirm password
Valid Inputs	Unique email Password and confirm password matches
Invalid Inputs	Password length is less than or greater than required
Steps	1. Enter input values in the form Username,password ,email and confirm password 2. Press register button
Expected Output	The user will be sent to the login screen. Succesfull registration message will be presented
Actual Output	Successful registraion of user
Status	Pass

Test Case Name	Forgot Password
Test Case ID	5
Description	This features sends the user to the forgot password page where user will put his/her mail and can reset password.
Testing Technique Used	Black Box Testing
Preconditions	User exists :means user already registered to the website
Input Values	Email New password
Valid Inputs	User Email
Invalid Inputs	New password does not meet requirements
Steps	1. Click at forgot password 2. Enter email and send reset link
Expected Output	Password reset email will be sent to user
Actual Output	Successful password reset
Status	Pass

Test Case Name	Remove Subjects
Test Case ID	7
Description	This features removes subjects that are added by admin
Testing Technique Used	Black Box Testing
Preconditions	There are some subjects added by admin
Input Values	Delete subject command
Valid Inputs	Delete the subject
Invalid Inputs	Mistake in URl or command
Steps	1. Press delete subject 2. It will delete it from database
Expected Output	The subject will be deleted
Actual Output	Successful deleteion of subject
Status	Pass

Test Case Name	Add Teachers
Test Case ID	8
Description	This feature will add teachers and list will be increased
Testing Technique Used	Black Box Testing
Preconditions	User role is admin and user is at teacher page
Input Values	String entered as Teacher name
Valid Inputs	No duplicate value
Invalid Inputs	Numeric Input, any mistake in Specified URL
Steps	1. Enter the teacher name in the field 2. Press add button
Expected Output	Teacher will be added
Actual Output	Successful addition of teacher
Status	Pass

Test Case Name	Remove Teachers
Test Case ID	9
Description	This feature delete required teacher from the list
Testing Technique Used	Black Box Testing
Preconditions	There are some teachers are added
Input Values	Delete command
Valid Inputs	The specified URL address and specified command
Invalid Inputs	any mistake in Specified URL
Steps	1. Select Teacher 2. Enter delete command to delete selected teacher
Expected Output	Teacher will be deleted from the list
Actual Output	Successful deletion of teacher
Status	Pass

Test Case Name	Add Students
Test Case ID	10
Description	This feature adds students and students groups
Testing Technique Used	Black Box Testing
Preconditions	User role is admin and user is at requested page
Input Values	Student data like CGPA, group members etc
Valid Inputs	String in the place of string fileds and numeric data at the numeric fields
Invalid Inputs	Numeric Input, any mistake in Specified URL
Steps	1. Enter all required data 2. Upload student image 3. Press Create student or group
Expected Output	The New student will be added
Actual Output	Successful addition of new student
Status	Pass

Test Case Name	Remove Students
Test Case ID	11
Description	This features removes requested student permanently from the list
Testing Technique Used	Black Box Testing
Preconditions	There must be student added in the list
Input Values	Delete command
Valid Inputs	The specified URL address
Invalid Inputs	Numeric Input, any mistake in Specified URL
Steps	1. Enter delete command in the browser 2. Press delete button
Expected Output	The student or group will be deleted from the list
Actual Output	Successful removal of Student
Status	Pass

Test Case Name	Add Class/Section
Test Case ID	12
Description	This features is responsible to add Class/section as per Admin request
Testing Technique Used	Black Box Testing
Preconditions	The computer is connected to internet, user role is admin and admin is at class/section page
Input Values	Section name
Valid Inputs	Correct values with no duplication
Invalid Inputs	Numeric Input, any mistake in Specified URL
Steps	1. Enter correct values in the field 2. Press add button
Expected Output	The class/section will be added
Actual Output	Successful addition of class/section
Status	Pass

Test Case Name	Remove Class/Section
Test Case ID	13
Description	This feature removes the class/section
Testing Technique Used	Black Box Testing
Preconditions	The computer is on and is connected to the internet, and a web browser is running and there is class and section added
Input Values	Delete command
Valid Inputs	The specified URL address and delete command
Invalid Inputs	any mistake in Specified URL
Steps	1. Select class and section to remove 1. Press delete button
Expected Output	The class/section will be deleted
Actual Output	Successful removal of class/section
Status	Pass

Test Case Name	Add Slots
Test Case ID	14
Description	This feature is responsible for adding slots as per admin request
Testing Technique Used	Black Box Testing
Preconditions	The computer is on and is connected to the internet, and a web browser is running and user role is admin and admin is at slot page
Input Values	Slot values for week days
Valid Inputs	Valid input values
Invalid Inputs	Numeric Input, any mistake in Specified URL
Steps	1. Enter slot details 2. Press add button
Expected Output	Slots will be added
Actual Output	Successful addition of slots
Status	Pass

Test Case Name	Remove Slots
Test Case ID	15
Description	This features sends a request to delete slots as per admin requirements.
Testing Technique Used	Black Box Testing
Preconditions	Internet is working and slots are added before
Input Values	Delete command of slots
Valid Inputs	The specified URL address
Invalid Inputs	Numeric Input, any mistake in Specified URL
Steps	1. Press delete button
Expected Output	The slots will be deleted
Actual Output	Successful deletion of slots
Status	Pass

Test Case Name	Generate Timetable
Test Case ID	16
Description	This features will generate timetable after getting all of inputs
Testing Technique Used	Black Box Testing
Preconditions	The computer is on and is connected to the internet, and a web browser is running and all predefined inputs are added
Input Values	Teachers,slots,sections and subjects
Valid Inputs	The specified URL address and valid information
Invalid Inputs	Numeric Input, any mistake in Specified URL
Steps	1. Enter all of input 2. Press generate timetable
Expected Output	The system will generate timetable
Actual Output	Successful generation of timetable
Status	Pass

Chapter 7: Conclusion & Future Work

Conclusion

In this thesis, we discussed a Department Training automation system that can manage student performance, grades, Final year project grades and grades of PG students for their thesis. Moreover, system provides a functionality to generate timetable dynamically as per department requirements. It works more efficiently and provide results very fast as system is using Node JS as backend and React JS as Frontend.

Our system has advantage in some more cases as well because for timetable generation it uses most appropriate algorithm. Techniques used in our proposed system are JWTtoken,rest apis,Mongodb collections and many more .

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2. Timetable Management System Java Project 2017 [online] Available at: <https://1000projects.org//>

3. student-management-system [online] Available at: <https://github.com///>

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