# SOFTWARE REQUIREMENTS SPECIFICATION

**FOR**

# Engineering College Automation and Scheduling System

**PREPARED BY**

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**VIT Chennai**

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# Revision History

| Name | Date | Reason For Changes | Version |
|---|---|---|---|
| LAB 1 | 30-09-2021 | Including Use case diagrams, Gantt chart, WBS & DFD | 2.0 |
| | | | |

# 1. Introduction

## 1.1 Purpose

The rationale of this document is to replace the existing manual College management system that had produced inconvenience not only to the students but also to the College administration. Our goal is to develop a secure, fast, accurate, and user-friendly system.

This project uses a web application concept to facilitate the departmental system in educational institutes. It uses the most reliable way of uniquely identifying students through website. Such type of web application is very useful in college for daily attendance. Hence, this project introduces a manageable and systematic approach of maintaining student and staff records.

## 1.2 Document Conventions

**HEADING**
**Font:** Times new Roman
**Size: 18**
BOLD

**SUB-HEADING**
**Font:** Times new Roman
**Size: 14**
BOLD

**CONTENT BODY**
**Font:** Times new Roman
**Size: 12**

Text in blue color and underlined are reference links which will redirect the user to reference links.

**NOTE** is written in bold to inform the reader about something important regarding the report.

## 1.3 Intended Audience and Reading Suggestions

While the software requirement specification (SRS) document is written for a more general audience, this document is intended for individuals directly involved in the development of this project. This document need not be read sequentially.

Below is a brief overview of each part of the document.

- **Part 1 (Introduction)** This section offers a summary of the project, including goals and objectives, project scope, general system details, and some major constraints associated with the intended platform.

- **Part 2 (Overall description)** It consists of an overview about the software with a brief insight on Product perspective, functionalities, Design and implementation, User classes, operating environment, assumptions and dependencies. This section is for developers, users and every person who will require this software.

- **Part 3 (External interface requirements)** This section describes the requirements for hardware, software, user and communication interfaces. This section is for developers and for the organization which will install the software.

- **Part 4 (system features)** This section describes about the system features required for the software. This section is very vital for developers as this will shed some knowledge regarding the features of the system required.

- **Part 5 (Non-functional requirements)** This section focuses on Non-functional requirements like Performance Requirements, Safety Requirements, Security Requirements, Software Quality Attributes, Business Rules. This section is for developers as well as the users.

- **Part 6 (Other requirements)** This section describes other additional requirements for the software. Both developers and users should read this section.

- **Part 7 (Appendices)** This section explains acronyms used in the report and also describes analysis reports about the software.

## 1.4 Product Scope

This software can keep a systematic record of student's details, mark sheet, attendance and defaulters list. This project enables the easy way of maintaining class attendance with fewer efforts.

The system also generates a brief report of attendance from the database according to subject-wise or date-wise as required.
A defaulter list can be generated through system.
Staff and HOD has the option to take a print of the reports and defaulter list is thus generated.

### ➔ BENEFITS

- It excludes the use of paper work and human efforts.
- The system is helpful as it generates a systematic overall report of every class attendance.
- The system helps the faculty to easily find out defaulters in a single click.
- It maintains the records in a large database instead of conventional method of maintaining register which further simplifies the process of searching for a particular record.
- Staff may easily get attendance and defaulter's list of a particular student.
- The system introduces a manageable and systematic approach of maintaining attendance records.
- It saves user time, cost and institute resources.

## 1.5 References


1) https://nevonprojects.com/
2) www.google.com
3) www.aakashtechsupportdocs.readthedocs.io


# 2. Overall Description

## 2.1 Product Perspective

### → TRADITIONAL SYSTEM

The previous enrolment system makes use of the manual process in setting up enrolments. Every end of the college year, the college administration will initiate the enrolments procedures as well as the admission process. Usually, it will start with a manual set up of enrolments and after setting up the enrolments process will follow. During the enrolments, students were manually registered, enrolled subjects and then billing or payment of student accounts occur on the cashier at the accounting department. After all these things are properly done, the student is officially enrolled, but this process consumes a lot of time especially if there are a lot of students.

### → PROPOSED SYSTEM

The proposed College Automation System is a multi-function processing operation which includes several modules that are working as one unit in general.
Here are some advantages of the proposed system.

- The program is faster and efficient than traditional approach.
- Minimizes Processing time.
- Eliminates Human errors.
- Records can be easily searched and reports can be easily generated.

## 2.2 Product Functions

This system comprises of 12 Modules:

**DESCRITPTION**

1. **ADMIN LOGIN**
   The admin of the software can manage the operations and can maintain the software and also check if there is any failure in the system.

   **SPECIFICATION:** Place holders for username & password. A submit button with university logo and information.

2. **ANNOUNCEMENTS**
   Here the students and the staff members can view all the important information regarding any current events or academic announcements in this section.

   **SPECIFICATION:** Announcement as title, all entered announcements to be displayed in bulletin points.

3. **STAFF LOGIN**
   The registered staff members can enter their credentials and also can manipulate their profiles.

   **SPECIFICATION:** Place holders for username & password. A submit button.

4. **STUDENT REGISTERATION AND LOGIN:**
   Students need to register themselves into the system. Registered students can access the system by logging into it

   **SPECIFICATION (Register):** Place holders for Name, Age, Gender, Course and all other information required. A placeholder for storing passport size photo of student. A button to save changes/Submit.

   **SPECIFICATION (Login):** Place holders for username & password. A submit button.
   .

5. **PROFILE UPDATION**
   The system allows the Staff member as well as Students to update their profile.

   **SPECIFICATION:** Displays profile. Modify Button. If clicked it allows to modify the data. Save changes button.

6. **TIME TABLE**
   The staff can create and modify the time table of particular students under them. Both the staff and students can view the time table.

   **SPECIFICATION:** Displays time table created by staff in a tabular form.

7. **ASSIGNMENTS**

Staff members can assign digital assignments and projects to the students.

**SPECIFICATION (staff):** Option to create Topics and upload assignments under the respective topics. View button to display the summary of students who have submitted and the defaulters.

**SPECIFICATION (student):** Download button to download the assignment uploaded by the faculty. Upload button to upload the assignment for student. Submit button to Submit.

8. **MATERIALS**

Staff members can provide materials, books, notes and other reference materials required for the subject.

**SPECIFICATION (staff):** Option to create Topics and upload materials under the respective topics.

**SPECIFICATION (student):** Download button to download the materials uploaded by the faculty.

9. **ATTENDANCE REPORT**

It will maintain daily attendance reports and generate automated overall report students wise.

**SPECIFICATION (staff):** List of students and a drop down by side of it. It will contain options of Present and Absent.

**SPECIFICATION (student):** View attendance in tabular form of all subjects

10. **MARKS & GRADES**

Here the system will allow the staff members to enter marks of the students subject wise or also individual student wise. The Grade system will operate automatically based on entered marks and class average.

**SPECIFICATION (staff):** Class/Subject wise categories. Entry of marks of students. Displaying student name and other details. Placeholder to enter marks.

**SPECIFICATION (student):** View marks and Grades respectively.

11. **SEARCH**

The Search operation will help staff members to navigate to a particular student and view their information, attendance reports, marks, grades etc.

**SPECIFICATION (staff):** Place holder to search Student name, Courses and easy navigation to different modules directly.

12. **REPORT GENERATION**

Here, the system allows Staff member as well as students to view and print the respective reports.

**SPECIFICATION:** Displays automated generated report by system based on marks, grades, evaluation of assignments done by staff. Print button to print the report.

13. **QUIZ**

Here, the system allows Staff member to generate a quiz for the students. The students can attend the quiz and the score will be displayed to the students at the end of the test.

**SPECIFICATION:** Questions are added by the faculty and student answers the quiz and can see their marks after the completion of quiz.

## 2.3 User Classes and Characteristics

There can be 3 user classes for this project,

i) **STUDENTS**

- The students are considered to have the basic knowledge of operating the internet and to have access to it.
- The students are limited to only view information in the software like time table, marks, grades etc.
- The students are restricted to modify any data in the system except their profile. They are only allowed to modify their profile.

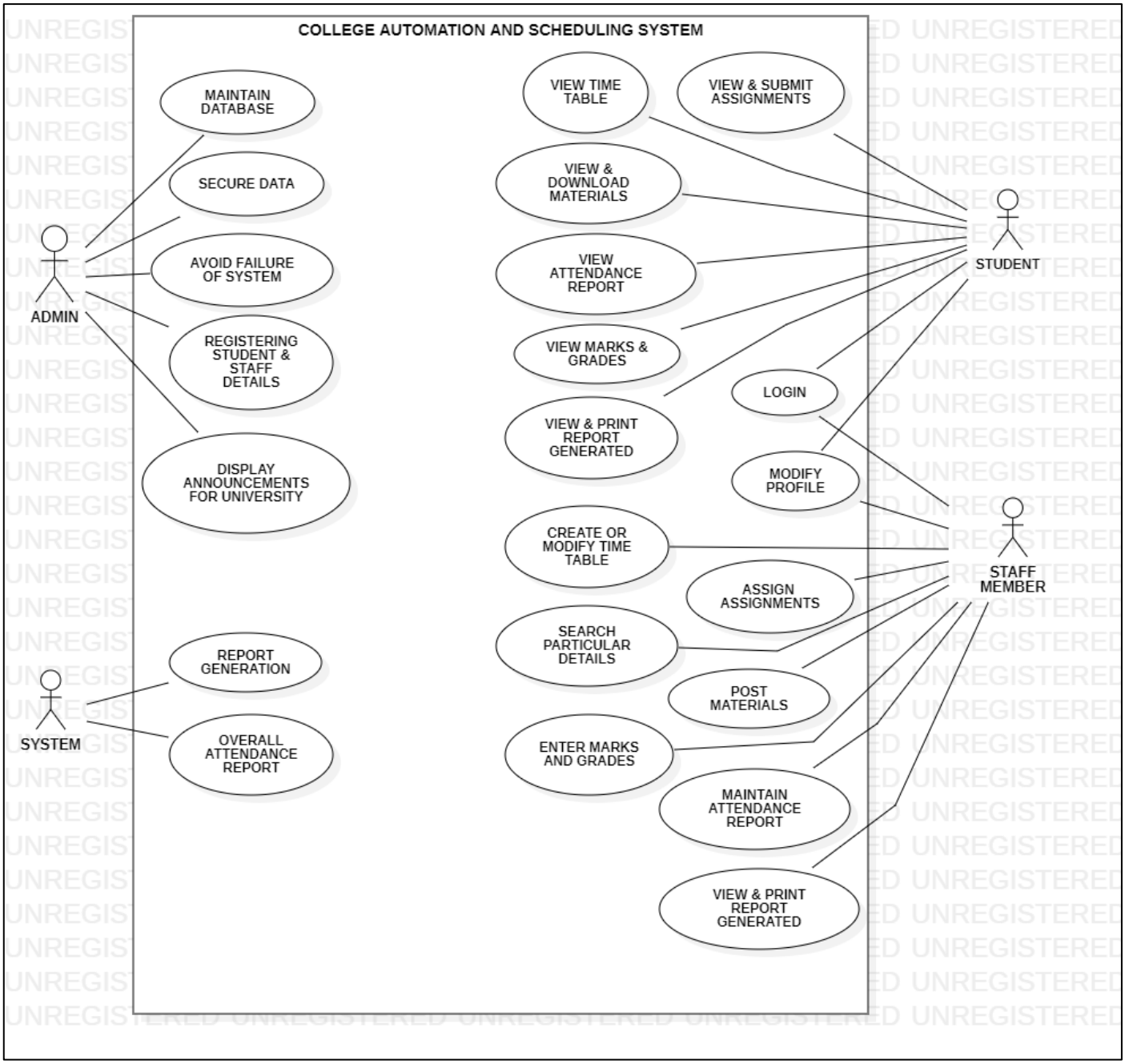
ii) **STAFF**

- The staff members are expected to have the basic knowledge of operating the internet and be familiar with the interface of the system.
- The staff members can update the students time table, marks, grades and attendance.

iii) **ADMIN**

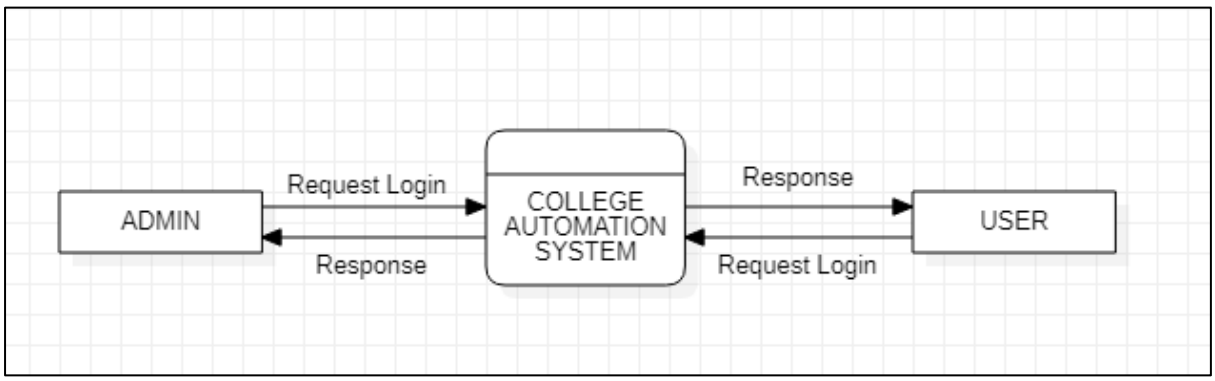
- The administrator is expected to be familiar with the interface of the tech support system.
- The admin is responsible for the smooth operation of the software.

# USE CASE DIAGRAM

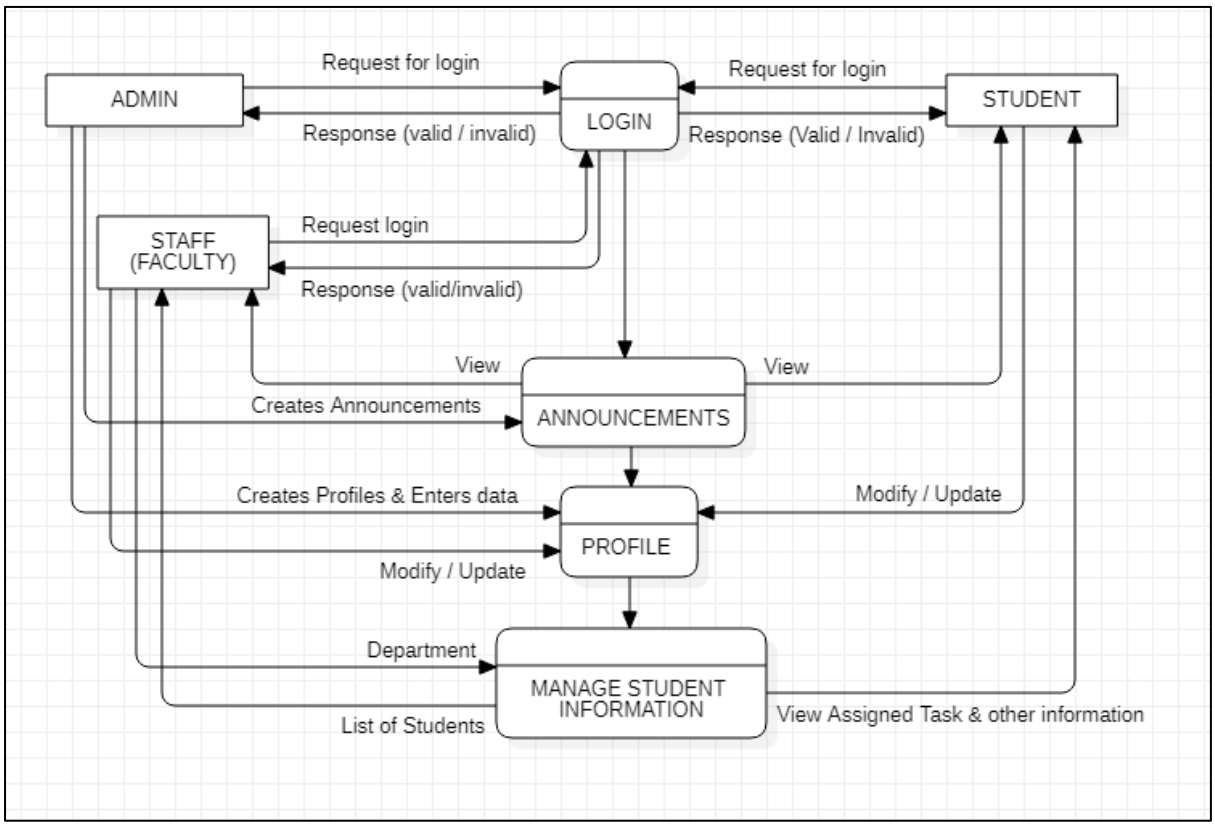


## DATA FLOW DIAGRAM (DFD)

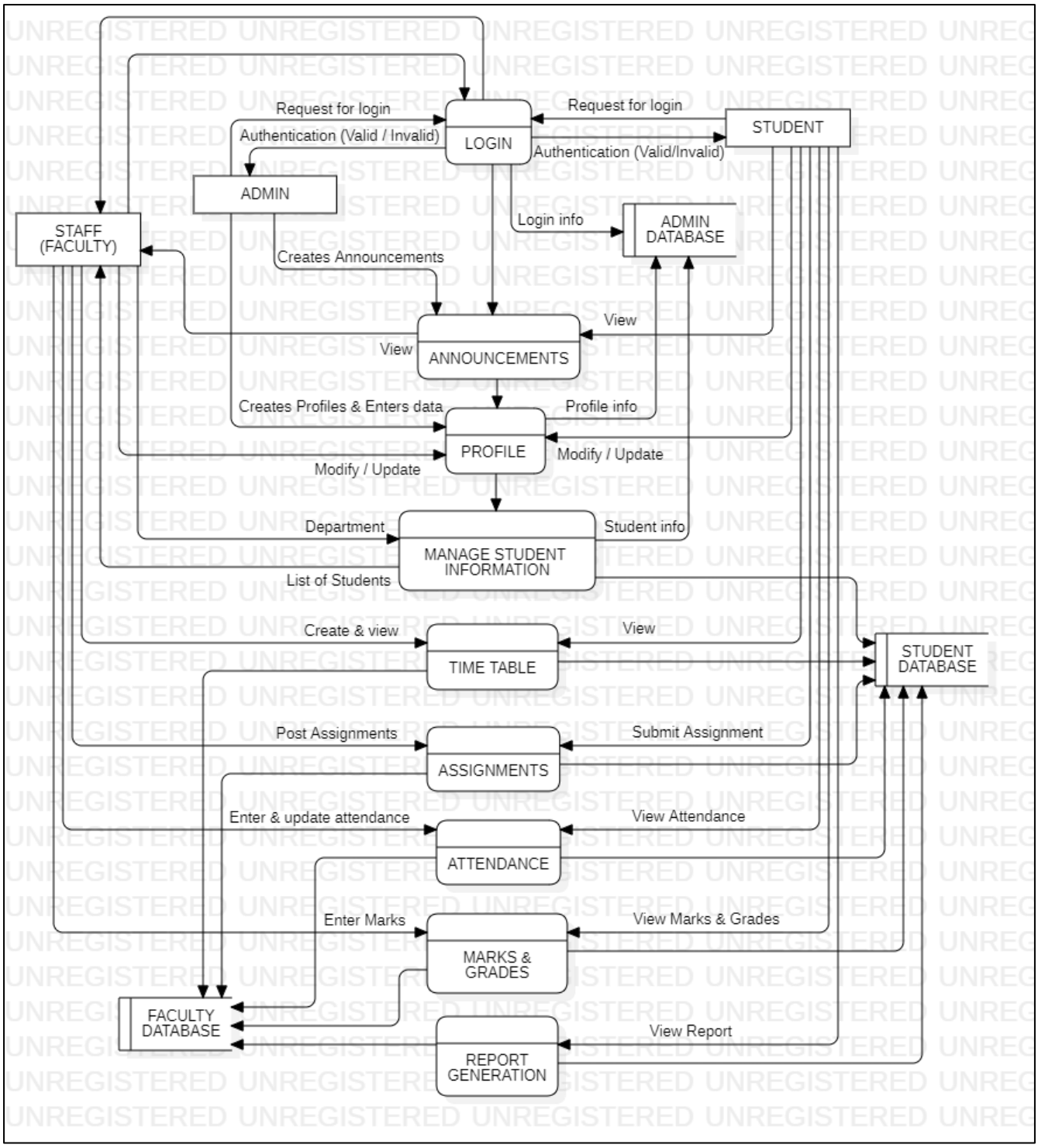
**LEVEL - 0**




**LEVEL – 1**



**LEVEL – 2**


Request for login
Authentication (Valid / Invalid)
LOGIN
Request for login
Authentication (Valid/Invalid)
STUDENT
ADMIN
STAFF (FACULTY)
Login info
ADMIN DATABASE
Creates Announcements
View
View
ANNOUNCEMENTS
Creates Profiles & Enters data
Profile info
PROFILE
Modify / Update
Modify / Update
Department
Student info
MANAGE STUDENT INFORMATION
List of Students
Create & view
View
TIME TABLE
STUDENT DATABASE
Post Assignments
Submit Assignment
ASSIGNMENTS
Enter & update attendance
View Attendance
ATTENDANCE
Enter Marks
View Marks & Grades
MARKS & GRADES
FACULTY DATABASE
View Report
REPORT GENERATION

## DATA DICTIONARY

### 1) STUDENT INFO

| STUDENT INFO | | | | | | | |
|---|---|---|---|---|---|---|---|
| REG. NO | NAME | DOB | COURSE | ADDRESS | ASSIGNMENT MARKS | MARKS | GRADES |
| 20BCE1901 | JOHN | 19-07-2002 | CSE | 2 Liverpool Street, London | 90/100 | 85/100 | A |
| 20BBA1902 | MIKE | 01-08-2002 | MGT | 16 Panda Street, London | 89/100 | 78/100 | B |
| 20BAI1903 | MARCUS | 05-04-2001 | AI | 15 Primary Street, London | 95/100 | 89/100 | A |
| 20BCE1904 | MONICA | 20-07-2002 | CSE | 40 Alan Avenue, London | 92/100 | 90/100 | S |

### 2) FACULTY INFO

| FACULTY INFO | | | | |
|---|---|---|---|---|
| ID | NAME | DOB | DEPARTMENT | ADDRESS |
| 1201 | RAJESH | 18-07-2002 | CSE | 14 Bake street, London |
| 1202 | SURESH | 01-05-2002 | CSE | 6, Omalo Apt, London |
| 1203 | SHARMA | 04-04-2001 | MGT | 8 Liverpool, London |
| 1204 | SABRI | 15-06-2002 | AI | 3, Lake view apt, London |

### 3) ADMIN INFO

| ADMIN INFO | | | | |
|---|---|---|---|---|
| LOGIN ID | PASSWORD | NAME | COURSE | FACULTY |
| 20BCE1901 | JO01 | JOHN | CSE | RAJESH |
| 20BCE1902 | MI02 | MONICA | CSE | SURESH |
| 20BCE1903 | MA03 | MIKE | MGT | SHARMA |
| 20BCE1904 | MO04 | MARCUS | AI | SABRI |

## DICTIONARY

### 1) STUDENT INFO

| Field Name | Data type | Field size | Data format | Description | Example |
|---|---|---|---|---|---|
| REG. NO | TEXT | 9 | NNLLLNNN | Unique registration number of students | 20BCE1651 |
| NAME | TEXT | 30 | | First Name of the students | JAKE |
| DOB | DATE / TIME | 10 | NN/NN/NNNN | Date of birth of students | 19-07-2002 |
| COURSE | TEXT | 8 | | Allotted course to student | CSE |
| ADDRESS | TEXT | 120 | | Residential address of the student | 2 Liverpool Street, London |
| ASSIGNMENT MARKS | NUMBER | 3 | NNN/100 | Marks of submitted assignment of students | 95/100 |
| MARKS | NUMBER | 3 | NNN/100 | Overall marks of each student | 92/100 |
| GRADES | TEXT | 1 | L | Grade of each student | A |

### 2) FACULTY INFO

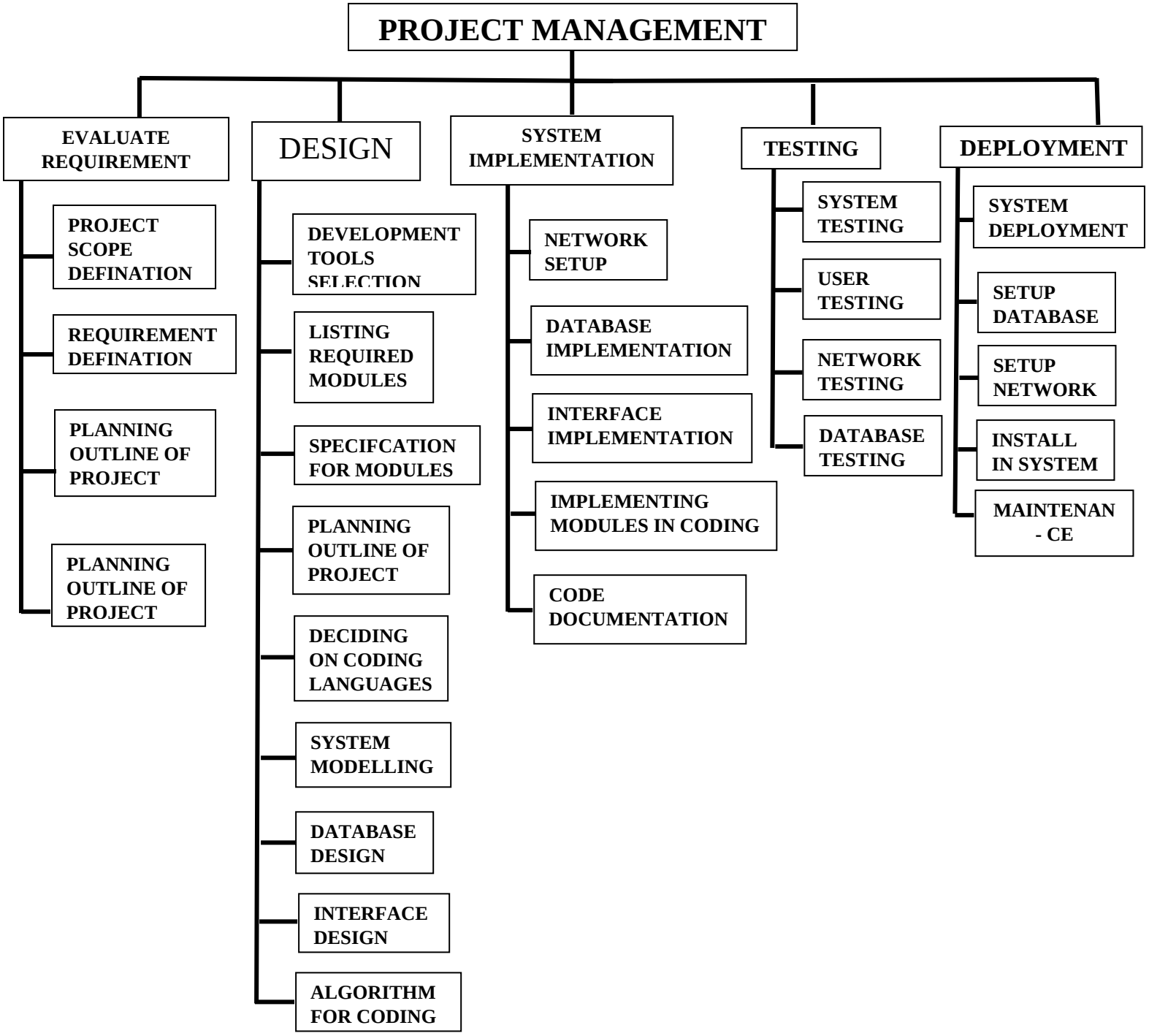
| Field Name | Data type | Field size | Data format | Description | Example |
|---|---|---|---|---|---|
| ID | NUMBER | 4 | NNNN | Unique faculty ID for each faculty | 1201 |
| NAME | TEXT | 30 | | First name of faculty | RAJESH |
| DOB | DATE / TIME | 10 | NN/NN/NNNN | Date of birth of faculty | 19-08-2002 |
| DEPARTMENT | TEXT | 8 | | Allotted department of faculty | MGT |
| ADDRESS | TEXT | 150 | | Residential Address of faculty | 14 Bake Street, London |
| PHONE NO. | NUMBER | 11 | 0NNNNNNNNNN | Phone number of faculty | 06380326044 |

### 3) ADMIN INFO

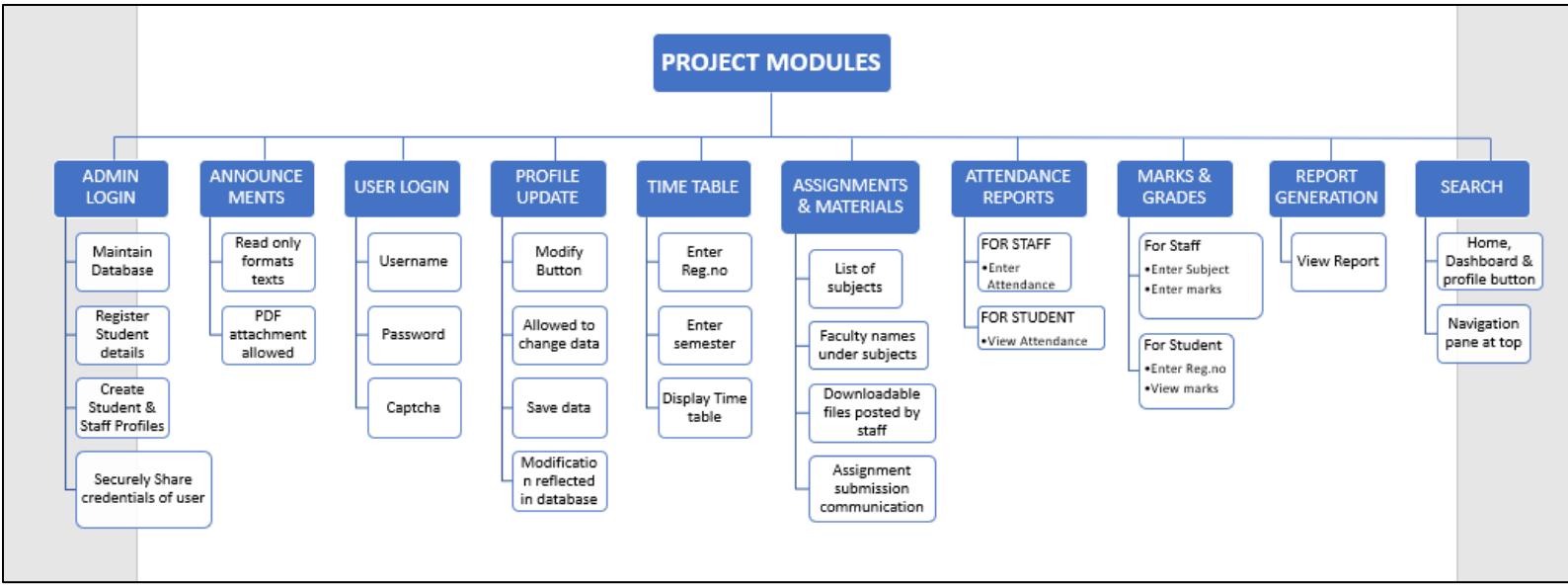
| Field Name | Data type | Field size | Data format | Description | Example |
|---|---|---|---|---|---|
| LOGIN ID | TEXT | 9 | NNNN | Unique login ID for each student | 20BCE1651 |
| PASSWORD | TEXT | 4 | LLNN | Unique password for each student for Authentication | JA51 |
| NAME | TEXT | 30 | | First name of the student | JAKE |
| COURSE | TEXT | 8 | | Alloted course to student | CSE |
| FACULTY | TEXT | 150 | | First name of faculty | SURESH |

## WORK BREAKDOWN STRUCTURE

➔ **PROJECT MANAGEMENT WBS**



## → PROJECT MODULE WBS



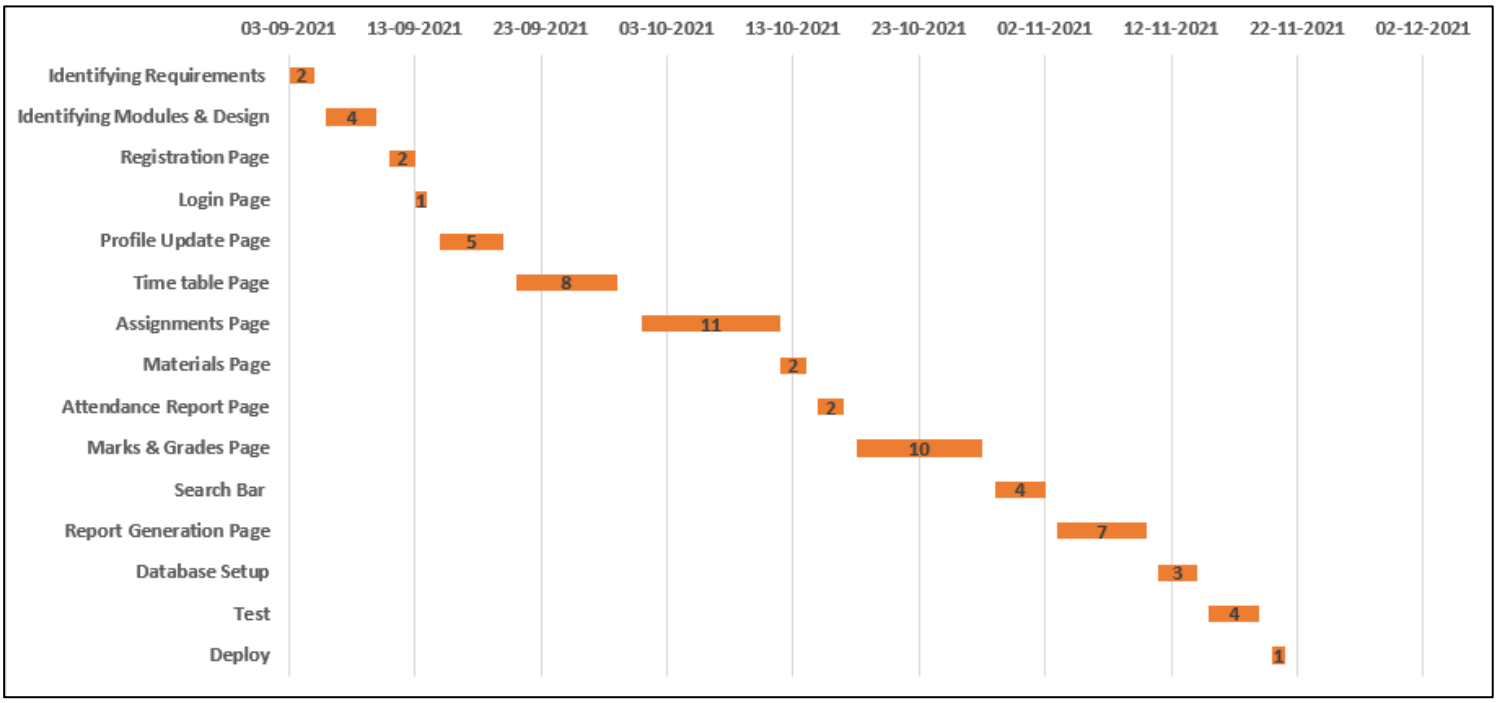

NOTE: Kindly zoom a little for more clarity. Thank you!!

## GANTT CHART

| S.NO | WORK | START DATE | END DATE | DURATION |
|---|---|---|---|---|
| 1 | Identifying Requirements | 03-09-2021 | 05-09-2021 | 2 |
| 2 | Identifying Modules & Design | 06-09-2021 | 10-09-2021 | 4 |
| 3 | Registration Page | 11-09-2021 | 13-09-2021 | 2 |
| 4 | Login Page | 13-09-2021 | 14-09-2021 | 1 |
| 5 | Profile Update Page | 15-09-2021 | 20-09-2021 | 5 |
| 6 | Time table Page | 21-09-2021 | 29-09-2021 | 8 |
| 7 | Assignments Page | 01-10-2021 | 12-10-2021 | 11 |
| 8 | Materials Page | 12-10-2021 | 14-10-2021 | 2 |
| 9 | Attendance Report Page | 15-10-2021 | 17-10-2021 | 2 |
| 10 | Marks & Grades Page | 18-10-2021 | 28-10-2021 | 10 |
| 11 | Search Bar | 29-10-2021 | 02-11-2021 | 4 |
| 12 | Report Generation Page | 03-11-2021 | 10-11-2021 | 7 |
| 13 | Database Setup | 11-11-2021 | 14-11-2021 | 3 |
| 14 | Test | 15-11-2021 | 19-11-2021 | 4 |
| 15 | Deploy | 20-11-2021 | 21-11-2021 | 1 |

| | |
|---|---|
| 03-09-2021 | 44442.00 |

**CHART:**




**LINK:** Attached link contains excel file of Gantt chart.

https://vitacin-my.sharepoint.com/:x:/g/personal/sparsh_wabhale2020_vitstudent_ac_in/EZcgF0Ovn9pEgCZNV12Gjs8BVK7E4dTDIOl30yDwrjW05Q

## 2.4 Operating Environment

This is a system which will require the operating environment of a client and server GUI. The software is expected to run in an interactive based environment where the system will run on the basis of interaction with user.

The software is required to run, maintain and process a real environment to manage database of the college. The centralized database is used to store the information. The users only within the college are allowed to access the software. The software is expected to run majorly on Windows. The software will further be upgraded to operate on various other operating systems.

The software would process data from a centralized database of the college to different departments or branches. The centralized data will be maintained, updated and secured by the administrator. The software will be installed in all the systems of the college and will be connected to the centralized database to access data through LAN (Local area network). This way the data can be accessed by various departments based on user interaction.

## 2.5 Design and Implementation Constraints

The software will be designed based on 3 constraints listed below,

i) Front end – The designing of software as to how will it look to user
ii) Back end – The programming of functionalities of software
iii) Database – To maintain all the data which will be displayed

The following languages can be used for the constraints to implement it

i) Front end – HTML, CSS, JavaScript
ii) Back end – Python, C#
iii) Database – MySQL, SQL (server)

**NOTE: The particular language will be decided in due course of time and will be updated in the document.**

## 2.6 User Documentation

The software is very simple to be downloaded and installed in the system. The system administrator should first set up a centralized database for the university. Then the software can be installed in all the systems of the university and can be connected to the central database using LAN.

The system administrator should create database in the central server and will now be responsible for the maintenance of the server, database and the software. The university can contact us in case of any technical problems in the software. The administrator should make sure the secure the network and servers to avoid any unauthorized login in the system.

Further detailed user manual steps will be provided as we develop the project.

## 2.7 Assumptions and Dependencies

The Login ID and password must be created by system administrator and communicated to the concerned user confidentially to avoid unauthorized access

It is assumed that new admission student's details are taken and updated in the system based on the rules and regulations of the university (fees and other necessities).

The chances of database or software failure depends on the maintenance of software to handle the number of users which can increase with time.

This software highly depends on type and version of browser being installed in the system.

# 3. External Interface Requirements

## 3.1 User Interfaces

The application GUI provides menus, toolbars, buttons, panes, containers, grids allowing for easy control by a keyboard and a mouse.

As of now, the software will consist of an admin panel, where the software and database will be maintained. There will be a login pane where the student/teacher will log into their profiles in the software. Further the software will contain options of viewing profile, attendance, marks etc.

Home button will be present in every page to redirect the user back to its dashboard for easy navigation in the software. A navigation pane will be there to easily traverse through different functionalities in the software.

## 3.2 Hardware Interfaces

Minimum requirement of a device

- i3 Processor Based Computer
- 1 GB RAM
- 50 GB Hard Disk
- Internet Connection

External support of a printer will be required to print reports generated through automation techniques.

The systems will be required to be in a networked environment as it is a multi-user system.

## 3.3 Software Interfaces

MS WINDOWS Operating system

➔ **ADMIN**

Database server (like SQL) for backend to store data
Any language like Java, python and C# to maintain the software

➔ **SOFTWARE REQUIREMENTS FOR TRANSFER OF FILES**

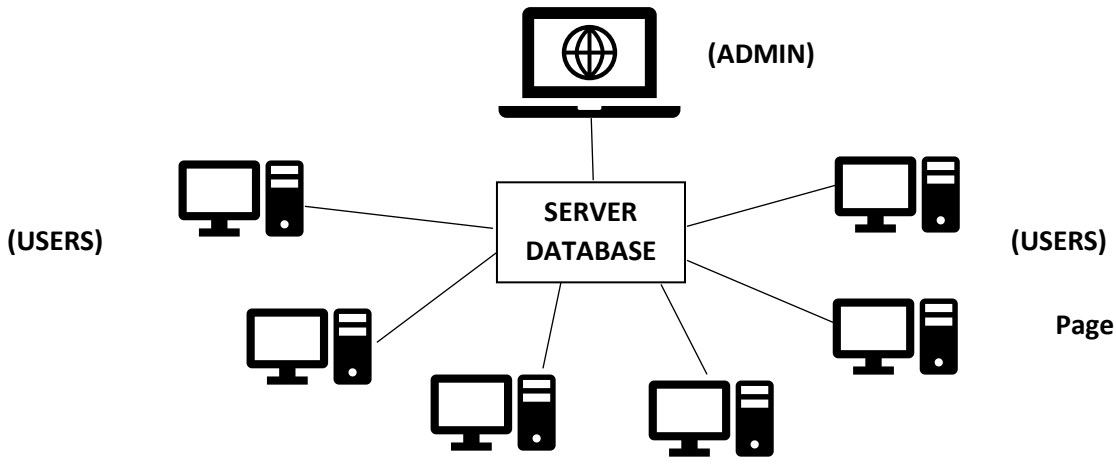
The application allows import a structured MS Word document.

The application allows populating a MS Word document with project data.

The application allows import / export a list of requirements from / to MS Excel sheet

## 3.4 Communications Interfaces

The systems are connected to main database server in LAN network model in university.



# 4. System Features

It is a comprehensive student information management system developed from the ground up to fulfil the needs of independent Colleges as they guide their students to success. The system integrated information automation system connects daily operations in the College environment ranging from Admissions and Registration to Finance, Faculty, timetable and attendance. This reduces data error and ensures that information is always up-to-date throughout the College.

1. It provides a single source of data repository for streamlining your business processes and reporting purposes.
2. It has a simple user interface and is intuitive. This ensures that the users spend less time in learning the system and hence, increase their productivity.
3. Efficient security features provide data privacy and maintains data integrity.
4. You can send email messages and notices to an individual or department.
5. Enables easy modifications, easy collaboration over the internet and offers complete life-cycle management for your business processes.
6. Supports your institution's daily operations by eliminating duplicate data entry, sharing the most up-to-date information, maintaining a detailed history of essential records

## 4.1 System Feature 1

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# 5. Other Nonfunctional Requirements

## 5.1 Performance Requirements

In this system, the authentication of the user is an important factor. In this system, user authentication will be done by login by user name and password and classified by user type. Users will get access to the system as permissions are classified for that type of user.

There will be multiple users like professors and students (approx. more than 2 L users) utilizing the software. So, it is required to maintain the performance of the software over all the systems.

## 5.2 Safety Requirements

This software will ease the process of student grading. At the end of every semester each student will receive a grade sheet generated by the administration using data uploaded by the course instructor on this software. All-important detail should be maintained in the hard copy as well.

The confidentiality of data in software is important as it consists of all important information regarding students, their profile, grades, certificates etc. It is very important to provide security measures to avoid unauthorized access/ hacks in the system.

## 5.3 Security Requirements

In this system, the authentication of the user is an important factor. In this system, user authentication will be done by login by user name and password and classified by user type. Users will get access to the system as permissions are classified for that type of user.

## 5.4 Software Quality Attributes

There are a number of attributes of software that can serve as requirements. It is important that required attributes by specified so that their achievement can be objectively verified. The following items provide a partial list of examples.
The input system will allow for inputting numbers, operands, special symbols and letters of the alphabet.

## 5.5 Business Rules

The rules as mentioned earlier,

**ADMINISTRATOR:** Responsible of maintaining the software at back end and front end as well.
**STAFF:** Staff are allowed to insert/modify the metrics of students in the software.
**STUDENTS:** Are restricted to only view information and modify their profile.

# Appendix A: Glossary

1. SRS: Software Requirements Specification.
2. GUI: Graphical User Interface.
3. LAN: Local Area Network

# Appendix B: Analysis Models

# Appendix C: To Be Determined List