Software Requirement Specification

for

(P012)University Management System

Version 1.0

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1 Introduction

1.1 Purpose

The primary purpose of this system is to build a durable and long-term solution for the management of assets of an educational institute, which is of increasing importance in the upcoming future of technological advancements. The aim is to provide an efficient database system to store and access academic data, and to build a channel for streamlining activities involving students, faculty, and management.

1.2 Intended Audience and Reading Suggestions

The document is meant for the students enrolled in an academic course provided by the university, the faculty, and the management of the institute. This document will serve as a reference document for the stakeholders in the project, the project manager, and the developer who will analyze, design, and implement the system. They will coordinate every activity that takes place in the software engineering process and will be guided by the staff of IITI Computer science & Engineering Department.

1.3 Project Scope

"University Management Website" is a platform where the students can access their academic information and interact with faculty in order to streamline the daily activities of an educational institute.
The project would consist of multiple subsystems -

- Academic Information Delivery System
- Timetable
- Assignment Creation and Submission (Files Manager System)
- Grading System
- Notice Board (For academic opportunities)
- Placement Section

The scope of this project is to provide an optimistic approach to make management easier and transparent both for student and faculty in an online environment.
The Software Development life-cycle Model used will be Agile Development with continuous reviews and delivery cycles.

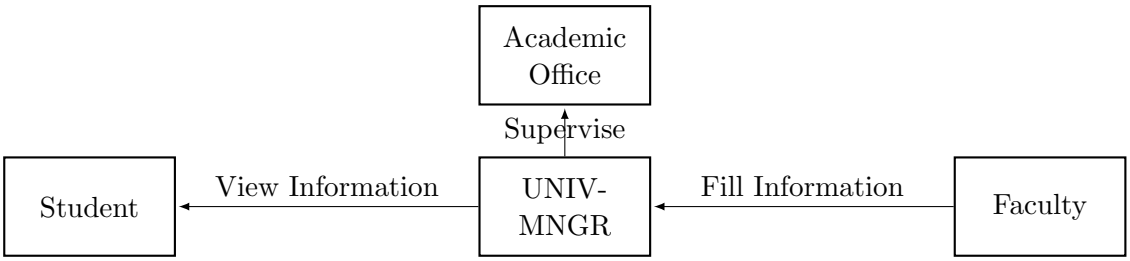

Fig-1: Software process-flow

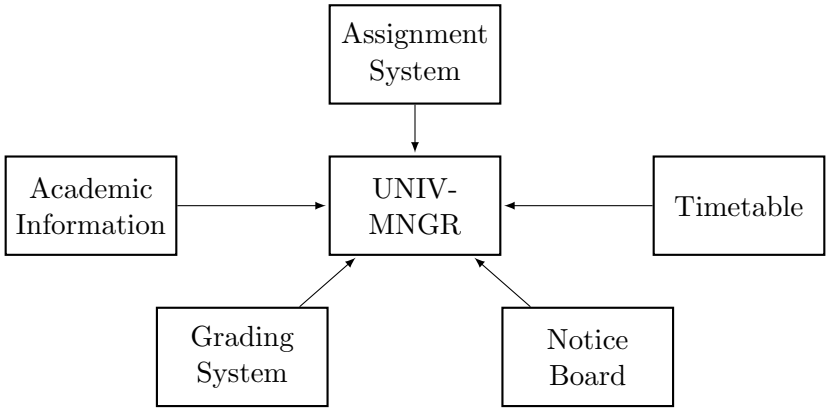

Fig-2: Subsystems of software

Figure 1(Entire process-flow) The entire flow is supervised by authorities involving academic office and director who looks over the entire functioning of website. The academic information will be updated by faculty on basis of students assignments and updated in the grading system. This data will be verified by the academic office and the student database will be updated.

Students will be enrolled by the admin. Then He/She will have to fill out their bio and build their profile on the website. This will be verified by academic-office and uploaded to the website. Students will be enrolled in their respective classes on basis of their academic program and year of enrollment.

The dashboard for student will show in detail the academic data sorted by years and classes enrolled with a generated timetable. They will be notified about pending assignments, graded assignments and overall performance through the dashboard.

Faculty will be added by admin through confirmation with academic-office. His offer letter and profile should be uploaded. The role of faculty like - HOD / Head lecturer will be set by the admin.

The dashboard of faculty will show his/her allotted classes along with a timetable, On clicking on a class, they will be able to create assignment and view and grade all submissions.

The Notice Board will be accessible to all through home page of our website. Only the admin can add notices - they can be regarding academic achievements or opportunities for student / faculty.

Future improvements can be to integrate a video and text based messaging / doubt clearing section for students and faculty and to develop an achievement section for toppers of the batch.

2 Overall Description

2.1 Product Perspective

"University Management System" is a website with main goal to inculcate technology in the process of managing University data and bring optimistic changes in this process. The main goal of this website is to streamline the daily activities of an educational institute and make it more interactive and efficient.

2.2 User Classes and Characteristics

"University Management System" has basically 4 types of users.

- Student
- Faculty
- Academic office
  - Director
  - Faculty Representative
  - Student Representative
- Company Recruiting Team

Academic office consists of multiple levels of management. On the top being the director, who handles the faculty and management. Then the faculty representative for different branches. Finally the students representative, who are the first point of contact for students and firms.

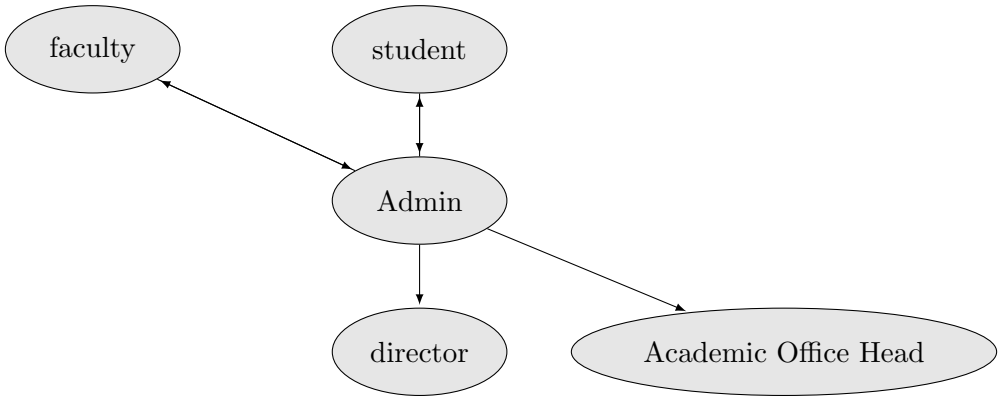

Fig-2: User hierarchy

2.3 Product Functions

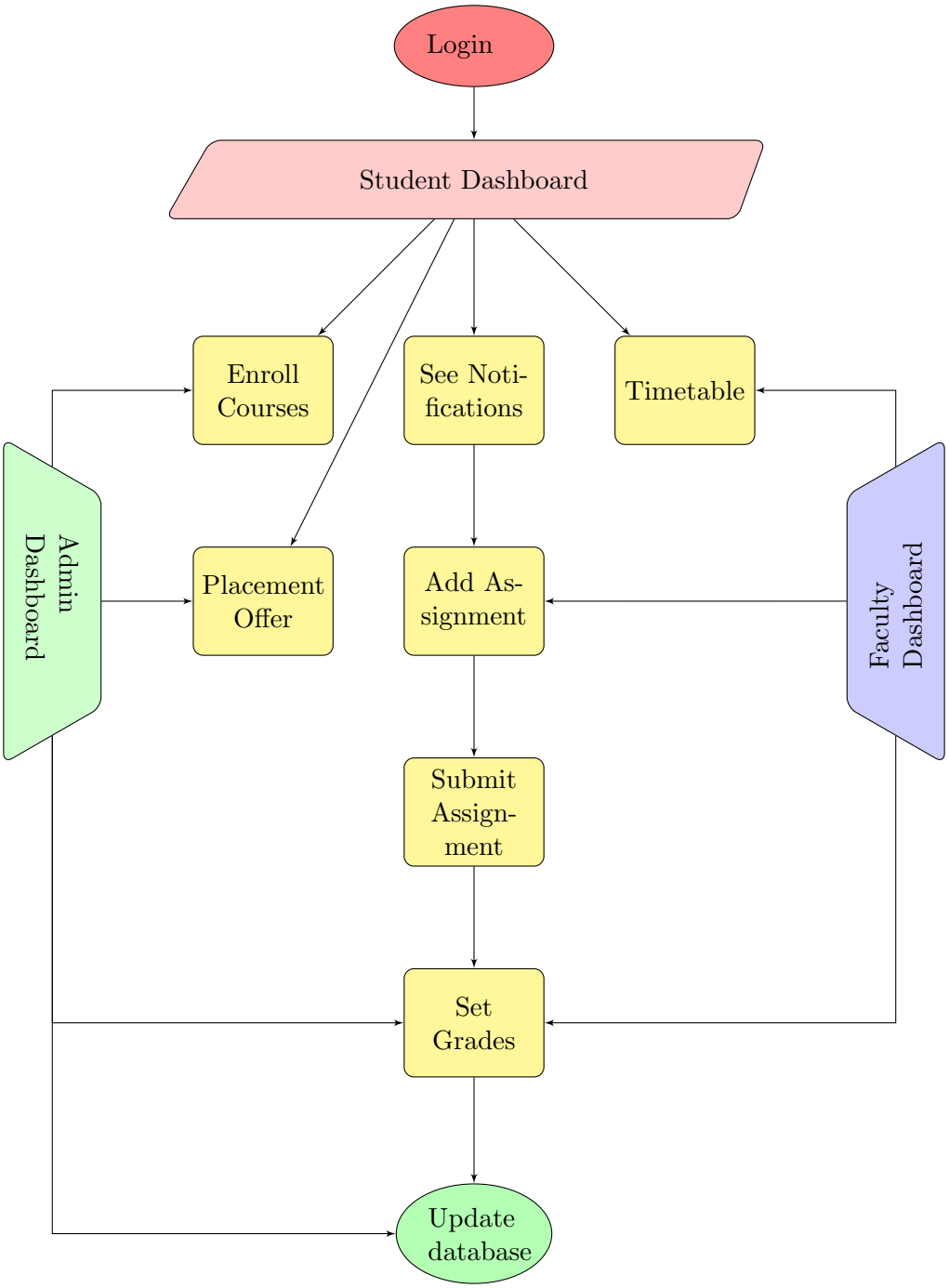

Fig-3: Process flow

"University Management System" stores details of all students, faculty of B.tech, M.tech and PHD.

New students, faculty can be added by university administration only, and login details will be provided to students, faculty.

All users have - user_id, user_name, first_name, last_name, user_id, email, phone_number, present_address, permanent_address and password_hash.

Students dashboard contains all relevant information about upcoming assignments, recruitment drives, eligibility and allotted grades. It should be a dynamic dashboard, it should track assignment status and after being checked by faculty it shows assignment grade. It also shows placement status, and after student is placed it will show relevant information like date of joining and package details ctc and benefits.

The faculty will have options to select submission deadlines, sort students based on parameters and take online test. Viva scheduling should be done using integrated calendar shared between student and faculty member. When student submits an assignment , student should be displayed as "done". Both these changes should be reflected in student dashboard as well as the faculty dashboard.

Files Manager System will be used for Assignment Creation by the respective faculty and submission by students. Files Manager System is managed by faculty only and students are allowed to upload submissions in the time slot allocated by faculty only.

Grading System will be used by faculty to add grades of student on basis of their performance in different assignments and will be verified by the academic office. The data will then reflect on the student dashboard along with the average score and ranking.

Placement analysis is an additional tool containing list of all students, sorted by date placed. Function to select using package, company_name and date_of_joining should be provided. A machine learning model shall be introduced to predict rate of growth and future placement statistics of IIT Indore.

2.4 Operating Environment

The website will be operate in any Operating Environment - Mac, Windows, Linux etc.

2.5 Design

Login activities will have 2 steps -

- Form Fill Up Process

- Profile development

Student and faculty will have to be registered on the website first. This process will be managed by admin section and supervised by the academic office. Profile development will involve basic details - name, address, hobby, display picture for the student.
For faculty it will contain - address and research interest and achievements.
A secure machine generated password key will be given at time of login which can be changed.
After login the respective dashboard will open

Admin / academic office activities will 5 steps -

- Register new member
- List of student
- Notification and mailing
- Final grades assignment
- Overview placement statistics

Admin section will have administrative access. It'll be able to monitor student and faculty profiles. The Dashboard will provide information of all students, faculty, which can be sorted through various parameters. Notifications of new activities can be posted by admin on home page of the website. A simple mailing system to send personal updates should be integrated. These components should be present as tabs on navbar and toggle required screen when clicked. For mobile/small-screens sidebar should be present.

Student dashboard will have 6 steps-

- Profile update
- View timetable
- Enroll in course
- View grades
- View Placement Opportunities

Student on login will see a dashboard with multiple options. Student can click on navbar tab components and view that section. Profile update section will allow uploading profile picture and updating parameters like address, phone number, resume and achievements. Student can view his grades for every assignment graded and overall result, and will be able to add his comments in case of a discrepancy. User will get notifications on his homepage about placement offers and grade updates etc. Student will also have an

option to apply for course at starting of Academic semester.

Faculty page will have 4 steps

- Profile update
- View courses teaching and timetable
- View and set Assignments
- Grades update

The faculty on login will see a dashboard with various options. Faculty can click on navbar tabs to view that section. Profile update will be similar to student section with additional research interest section. The faculty can view the classes he's teaching and corresponding timetable. He/She can set assignment per class, and keep track of the files submitted by students. Then he/she will have option to grade students in the grading section - having search and sort features.

Placement section will have 4 steps

- Company login
- View students and academic profiles
- Schedule interview and coding round
- Display result and send offer letter

The company will have reach out to TPC and generate their unique ID and password. This will be used for login where they will have access to student information and resumes. They will get an option to sort and search for students based on different parameters like interview score, CPI etc. Finally they can reach out to the student through inbuilt email section. The components will be available as navbar tabs and for mobile/tablets side menu will be implemented.

3 System Features

"University Management System" is a web service. Main objective of this website is to streamline the important activities required for functioning of an institute.

3.1 Description and Priority

"University Management System" has many important features and also some sub features, all of which are important for well functioning of the website.
The features with priority up to down -

1. Academic Database and Information System: This is main objective of this software. To develop a simple and structured way to insert and access academic data.
2. Scheduling: This feature essentially aims to schedule classes(Timetable) and events without any clash.
3. Assignment system: To facilitate the management of assignments and student submissions in a single place.
4. Grading system: To assign grades and academic report for the students.
5. Admin system: They will supervise and enroll students and faculty. They will be able to see statistics and send notices.

3.2 Functional Requirements

The "University Management System" website should be build on flask (python framework), Bootstrap and material-ui for front-end and mySQL database.
Back-End - python flask.
Front-End - Bootstrap, JavaScript.
Database - mySQL.
Testing - python & javascript.

S.no.	Features	Priority
1	Create an Account	High
2	Log in	High
3	Change Password	Low
3	Forgot Password	Medium
4	Update Profile	Medium
5	Notice board	Medium
6	Timetable	Medium
7	Manage student	High
8	Manage faculty	High
8	Assignment section	High
8	Grading section	High
8	Placement section	medium
9	Statistics	Low

Table:1 Priority of features

Feature	Remark
Register	This Functionality is used to register student, faculty.
Log In	This functionality is used to Login for admin, student, faculty.
Change Password	This functionality is used to change the password of account.
Forgot Password	This functionality is used to send mail for the password change.
Notification board	This functionality shows notification about academic activities in near future.
Timetable	This functionality is used to generate timetable for student and faculty.
Update Profile	This functionality is used by the client to update personal information.
Assignment Section	This functionality is used by faculty to set and keep track of assignments.
Grading Section	This functionality is used to add and view grades after verification.
Manage Student	This functionality is used by the admin to manage student.
Manage faculty	This functionality is used by the admin to manage faculty.
Student List & Sort	This functionality is used by the company to search students from list.
Schedule Interview	This functionality is used by the company to schedule interview timings.
Contact Student	This functionality is used by the company to contact to students through integrated mail.
Stats Placements	This functionality is used by client to display placement statistics.
Prediction Placements	This functionality is used by client to predict future stats based on machine learning.

Table:2 Features specification

4 Other Nonfunctional Requirements

4.1 Performance Requirements

1. The completely separate business logic at admin side from the student interface ensures good performance.
2. The system exhibits high performance because it is well optimized. The business logic is clearly separate from the UI.
3. System should be able to scale to many users concurrently.
4. The response time of processes is as follows:
   - Faculty Registration max 10 seconds
   - Assignment Uploading max 10 seconds
   - Assignment Submission max 10 seconds
   - Grade Submission max 10 seconds
   - Student Registration max 10 seconds
   - Company Registration max 15 seconds
   - Company Job posting max 15 seconds
   - Student applying for job max 20 seconds
5. System is available 24 by 7

4.2 Safety Requirements

1. Errors will be minimized and an appropriate error message that guides the user from an error will be provided.
2. Validation of users input is highly essential.
3. The time taken to recover from the error is less than 10 second.

4.3 Security Requirements

1. The system is provided a high level of security and integrity of the data held by the system. In case of unauthorized access a error page will be generated.

2. only authorized personnel such as admin can gain access to the to the private data and only the user with valid username and password is allowed to view its user page.

4.4 Software Quality Attributes

1. The key software quality attributes are Availability, Reliability and usability.
2. As the system is expected to be 24/7 working. High availability is important.
3. A simple but quality user interface is developed to make it easy to understand and required less training.
4. The error message displayed is more descriptive and can be easily understood.

4.5 Business Rules

1. System shall be available only for the particular college.
2. All the users shall access the system using a login/user-id and password. The login-id/password will be managed in a secured manner by using md5 hashing.
3. Each student can make at-most one submission to an assignment.
4. Each faculty can update the grades as they wish.
5. Each student can get recruitment only in one company.
6. Once company selected the candidate, it cannot be rejected otherwise company will be blacklisted.
7. Each student and faculty can have only one account.

5 Other Requirements

"University Management System" needs maintenance as it is a long process software and will see high traffic almost every single semester of the year. It will need re-factoring and further the requirements can be changed as the field is changing frequently. Based on feedback from the stakeholders new features can be added and issues can be resolved.