DELHI TECHNOLOGICAL UNIVERSITY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SE313 : SOFTWARE ENGINEERING
<SRS REPORT>

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DTU BASED UNIVERSITY MANAGEMENT SYSTEM

1. Introduction

1.1 Purpose

The main objective of this document is to illustrate the requirements of the project DTU based University Management system. The document gives the detailed description of the both functional and non-functional requirements proposed by the client.The purpose of this project is to provide a friendly environment and deals with the maintenance of university, college, faculty, student within the university and used to store the college, faculty, student, courses & information of a college.
The main purpose of this project is to establish an integrated University Management system which enables us to automate the dynamic administrative processes in the university and other activities like attendance, student marks, fee payment, and salary payment, etc. The information is stored for decision making in the future for a business process within an organization. This is a desktop application.
This document describes the hardware and software interface requirements using ER diagrams and UML diagrams.

1.2 Document Conventions

- Entire document should be justified.
- Convention for Main title

Font face: Times New Roman Font style: Bold
Font Size: 14

- Convention for Sub title

Font face: Times New Roman
Font style: Bold
Font Size: 12

- Convention for body

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1.3 Proposed System

In this project, the system is proposed by understanding the issues in the existing system. In this management system the problems are solved that were in the previous system by shifting on a computerized system of the modern age. The database is used to store the data at the backend of the system.
The graphical interface GUI is developed in Java. In a certain way get the data from the user and store it into the database. The system that is proposed provides consistent and redundancy free data in storage and should be more efficient.
This system provides the security of data by authentication of users and in this project right of users are defined. In this system, admin is the main user of the system who has full rights of all modules within the proposed system and the other user which is an employee of college also can be a teacher within the college has limited access to the system like students attendance and marks of the students are managed by the employee. In this product, different reports can be generated, fee report of fee payment if students, student details, attendance report, etc.
The main modules which are focused on this project:

- Student management
- Employee management
- Student Fee management
- User registration
- Internal Marks of students
- Attendance of students
- Reports of all modules

1.4 Scope of Development Project

As Colleges are growing day by day more and more, and also increasing the complexity of storing information of students and related to the college system, they face many related issues: attendance and fee of students, salary details of employees, etc.
This project is based on the educational institute system where this application gives maximum services in a single software product that is used by teacher and system administration. This project is based on a desktop application that is sharing information on different departments in a college.
In this project that includes Java and SQL. Java is used to design the GUI for the application by which the user can interact with software applications. The My SQL Server is used for creating the database in which different information will store. The main focus of this project is to give the best GUI for the users and provide the many modules in a single product. Admin can view all of the information that is stored in the database through application and admin also can modify this information because the admin has full access to the system.
The teacher can view and modify the information related to students, teachers have limited access. This project can adjust any additional module at any time.

1.5 Definitions, Acronyms and Abbreviations

JAVA -> platform independence
SQL-> Structured query Language
ER-> Entity Relationship
UML -> Unified Modeling Language
IDE-> Integrated Development Environment
SRS-> Software Requirement Specification
IEEE ->Institute of Electrical and Electronics Engineers

1.6 References

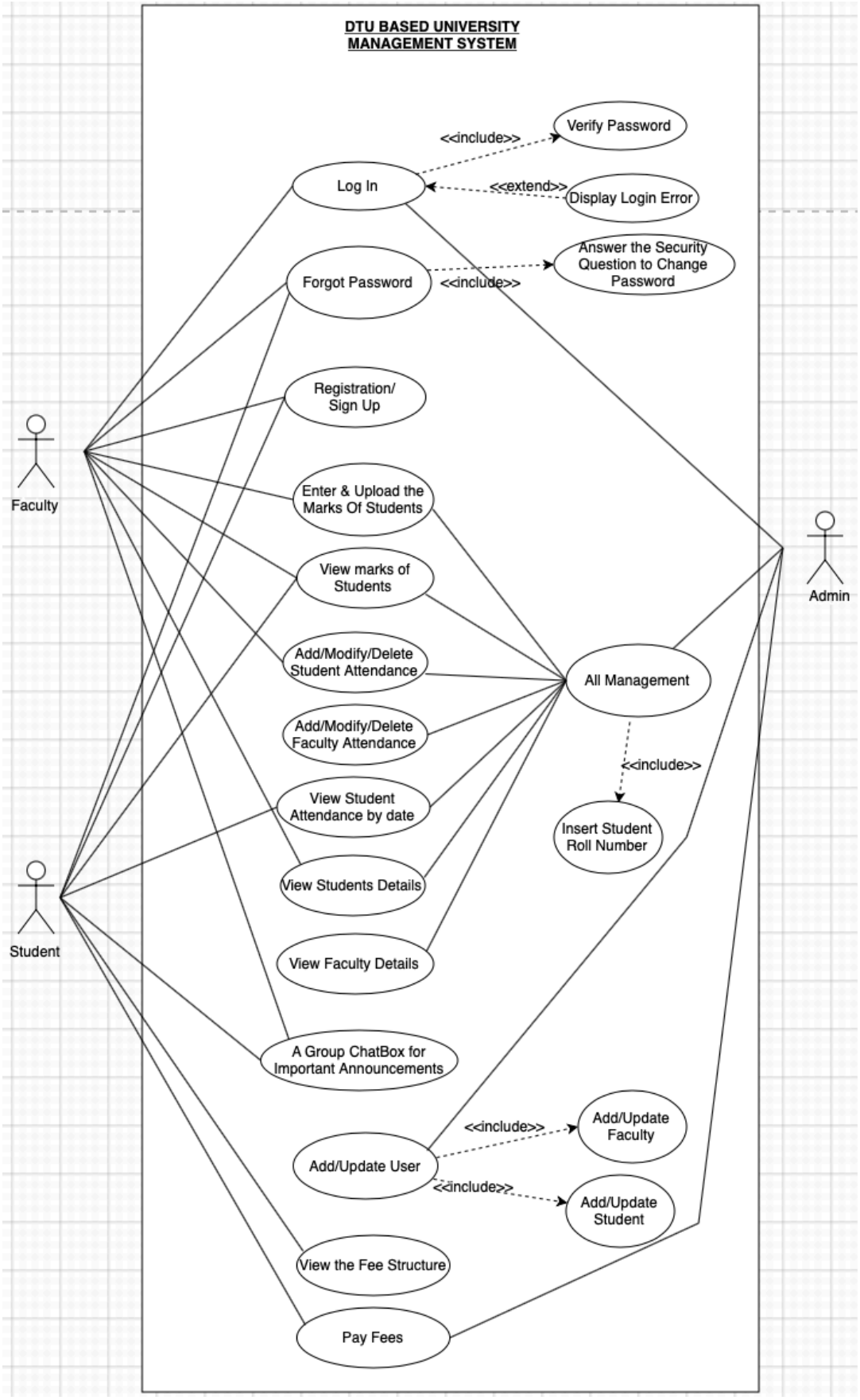
- Websites

https://www.slideshare.net/surendrakumarmahala/college-management-system-project-srs-2015
https://www.youtube.com
https://www.geeksforgeeks.org
https://www.javatpoint.com

2. Overall Descriptions

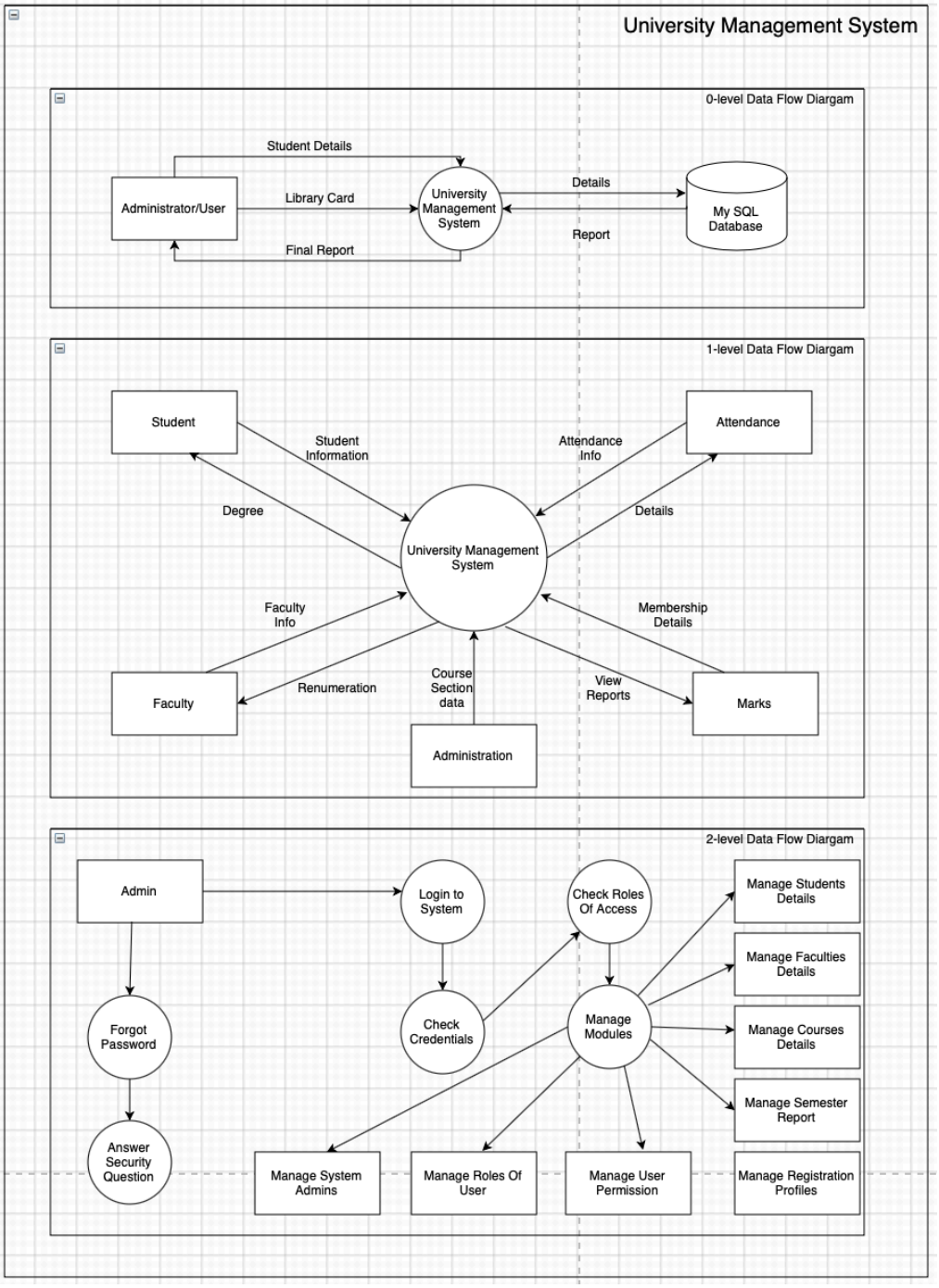
2.1 Product Perspective

Use Case Diagram of University Management System


DTU BASED UNIVERSITY
MANAGEMENT SYSTEM
Verify Password
<<include>>
Log In
<<extend>>
Display Login Error
Answer the Security Question to Change Password
Forgot Password
<<include>>
Registration/ Sign Up
Faculty
Enter & Upload the Marks Of Students
View marks of Students
Admin
Add/Modify/Delete Student Attendance
All Management
Add/Modify/Delete Faculty Attendance
<<include>>
View Student Attendance by date
Insert Student Roll Number
Student
View Students Details
View Faculty Details
A Group ChatBox for Important Announcements
<<include>>
Add/Update Faculty
Add/Update User
<<include>>
Add/Update Student
View the Fee Structure
Pay Fees

2.2 Product Function

Data FlowDiagram of University Management System



This document describes the software requirements specification (SRS) for the University Management System that provides the access and management of information of different modules in a university-like Students, Teachers/Faculty. Our project is based on a database, which stores and maintains the information of different modules within the system. The advantage of the management system is to avoid entries in hard copies and it saves the burden of hard copies of data. The system is a Desktop Application and GUI for this

system is developed in Java. The Database for this management system is created in My SQL. There are three users for this system:
1. Admin (have full access to read and write of all modules in management system)
2. Teacher (have access limited to write and manage the student's marks, attendance, etc.).
3. Student(have access to view their marks, attendance and chat with the teachers in group chat section)

This document describes the details of our product, its parameter, and its goals. This SRS document describes the target, audience, user interface of product and Software/Hardware requirements of our product. This document also describes the problem we have faced during the designing and implementation of the product and also describes how we have solved this problem and make our product more efficient. The management system saves the human power and time cost to perform the same task. The data in the database can be saved for a long time and can be used for different purposes in the future. In management systems, there is a minor chance of losing the data. This document also defines how customers and users see our product and understand the functionality of the product. This document will help the developers/designers in case of maintenance of the software product.

2.3 User Classes and Characteristics

The system provides different types of services based on the type of users [Member/Librarian]. The Admin will be acting as the controller and will have all the privileges of an administrator. The member can be either a student or faculty of the university who will be accessing the application online.
The main objective of the proposed university management system is to computerise the existing system and reduce manpower and time consumption. It provides the following features :

- Maintain information of students and teachers.
- Generate test results and students!"score related to respective subject and department.
- Reduce error in data management
- Safe & Secure database management
- Easy and user-friendly interface for the operator of the system
- Reduce paper work and time consumption
- SQL database contains all the information about the authenticated user. User without his username and
  password can not enter into the login, only if he is an authenticated user then he
  can enter his login.
- Password of the user can be retrieved if forgotten by the user by answering a security question.
- Usernames are unique for every user.
- Hashing is used while storing password to SQL Database so even if someone who has access to the database can not figure out any user!s password.
- During Signup, user has to create a strong password to complete Signup thus making the user!s account more secure.
- A Group Chat Messenger for interaction between students and teacher.
- Users can print their personal details or Result.

2.4 Operating Environment

The UMS is expected to be deployed in a real environment to manage the DBMS inside the college. The centralized database is used to store the information. The user only within the college (members of college staff) can use this management system. Users outside form the college cannot access the management system. This application is developed for windows & Mac operating system.
The database is used in different departments within a branch of the college. The database used to store the information is the centralized database. The software we have developed will be installed on different computer systems within a college and software will be connected to a centralized database through LAN within a college and then the user can interact with the system and can store the data and other users can get access the stored through a centralized database.

2.5 Assumptions and Dependencies

The assumptions are:-
- The coding should be error free
- The system should be user-friendly so that it is easy to use for the users
- The information of all users, marks and attendance must be stored in a database that is accessible by the website
- The system should have more storage capacity and provide fast access to the database
- The system should provide search facility and support quick transactions
- The University System is running 24 hours a day
- Users may access from any computer that has Internet browsing capabilities and an Internet connection
- Users must have their correct usernames and passwords to enter into their accounts and do actions

The dependencies are:-
- The specific hardware and software due to which the product will be run
- On the basis of listing requirements and specification the project will be developed and run
- The end users (admin) should have proper understanding of the product
- The system should have the general report stored
- The information of all the users must be stored in a database that is accessible by the University System
- Any update regarding the user from the university is to be recorded to the database and the data entered should be correct

2.6 Requirement

Software Configuration:-
This software package is developed using java as front end. My SQL as the back end to store the database.
Operating System: Windows NT, windows 98, Windows XP, Mac OS
Language: Java Runtime Environment, IntelliJ IDEA (front end)
Database: My SQL Server (back end)
Hardware Configuration:- Processor: Pentium(R)Dual-core CPU Hard Disk: 40GB
RAM: 256 MB or more

2.7 Data Requirement

The inputs consist of the query to the database and the output consists of the solutions for the query. The output also includes the user receiving the details of their accounts. In this project the inputs will be the queries as fired by the users like create an account, recording attendance , uploading marks and putting into account. Now the output will be visible when the user requests the server to get details of their account.

3. External Interface Requirement

3.1 GUI

The software provides good graphical interface for the user and the administrator can operate on the system, performing the required task such as create, update, viewing the details of the students. The graphical interface GUI is developed in Java using Swing concept.

- It allows user to view quick reports like marks in different subjects, attendance etc.
- It provides search facility based on different criteria.
- The user interface must be customizable by the administrator
- All the modules provided with the software must fit into this graphical user interface and accomplish to the standard defined
- The design should be simple and all the different interfaces should follow a standard template
- The user interface should be able to interact with the user management module and a part

of the interface must be dedicated to the login/logout module

Login Interface:-
In case the user is not yet registered, he can enter the details and register to create his account. Once his account is created he can 'Login' which asks the user to type his username and password. If the user entered either his username or password incorrectly then an error message appears.

Search:-
The admin or faculty can enter the roll number of the student he is looking for, then all the details of the student is displayed.

Admin's Control Panel:-
This control panel will allow librarian to add/remove users; add, edit, or remove a resource. And manage lending options.

5. Other Non-functional Requirements

5.1 Performance Requirement

The proposed system that we are going to develop will be used as the Chief performance system within the different campuses of the university which interacts with the university staff and students. Therefore, it is expected that the database would perform functionally all the requirements that are specified by the university.

- The performance of the system should be fast and accurate
- University Management System shall handle expected and non-expected errors in ways that

prevent loss in information and long downtime period. Thus it should have inbuilt error testing to identify invalid username/password

- The system should be able to handle large amount of data. Thus it should accommodate

high number of users without any fault.

5.2 Safety Requirement

The database may get crashed at any certain time due to virus or operating system failure. Therefore, it is required to take the database backup so that the database is not lost. Proper UPS/inverter facility should be there in case of power supply failure.

5.3 Security Requirement

- System will use secured database
- Normal users can just read information but they cannot edit or modify anything except

their personal and some other information.

- System will have different types of users and every user has access constraints
- Proper user authentication should be provided
- No one should be able to hack users' password
- There should be separate accounts for admin and members such that no member can

access the database and only admin has the rights to update the database.

5.4 Requirement attributes

- There may be multiple admins creating the project, all of them will have the right to create changes to the system. But the members or other users cannot do changes
- The project should be open source
- The Quality of the database is maintained in such a way so that it can be very user friendly to all the users of the database
- The user be able to easily download and install the system

5.5 User Requirement

The members are assumed to have basic knowledge of the computers and internet browsing. The administrators of the system should have more knowledge of the internals of the system and is able to rectify the small problems that may arise due to disk crashes, power failures and other catastrophes to maintain the system. The proper user interface, user manual, online help and the guide to install and maintain the system must be sufficient to educate the users on how to use the system without any problems.
The admin provides certain facilities to the users in the form of:-

- Backup and Recovery
- Forgot Password
- Data migration i.e. whenever user registers for the first time then the data is stored in the server
- Data replication i.e. if the data is lost in one branch, it is still stored with the server
- Auto Recovery i.e. frequently auto saving the information
- Maintaining files i.e. File Organization
- The server must be maintained regularly and it has to be updated from time to time

6. Design and Implementation Constraints

During the implementation of the product, different challenges are faced. Choosing the interface for the management system was a paramount issue. Connecting the database with the application was a major problem.
For connecting the database we had to create our account in ORACLE and then we had to download the driver(software). The connection of the database that is created in ORACLE with Java is not very simple as like My SQL. So the installation of ORACLE driver(software) is necessary to create a connection between ORACLE and Java. But after installing the required driver it creates a problem in installing and connecting with a server in the oracle server, so we decided to leave the oracle and then we choose the My SQL to create the database.
The My SQL Server is easy to install and connect with a server in SQL it is very easy to understand the implementation of the database and also easy to create a new database and connect with the GUI application.

6. Other Requirements

6.1 Data and Category Requirement

There are different categories of users namely teaching staff, Librarian, Admin, students etc. Depending upon the category of user the access rights are decided.It means if the user is an administrator then he can be able to modify the data,delete, append etc. All other users except the Librarian only have the rights to retrieve the information about database. Similarly there will be different categories of books available. According to the categories of books their relevant data should be displayed. The categories and the data related to each category should be coded in the particular format.

6.2 Glossary

The following are the list of conventions and acronyms used in this document and the project as well:

- Administrator: A login id representing a user with user administration privileges to the software
- User: A general login id assigned to most users

- Client: Intended users for the software
- SQL: Structured Query Language; used to retrieve information from a
- SQL Server: A server used to store data in an organized format
- Layer: Represents a section of the project
- User Interface Layer: The section of the assignment referring to what the user interacts with directly
- Application Logic Layer: The section of the assignment referring to the Web Server. This is where all computations are completed
- Data Storage Layer: The section of the assignment referring to where all data is recorded
- Use Case: A broad level diagram of the project showing a basic overview
- Class diagram: It is a type of static structure diagram that describes the structure of a system by showing the system's cases, their attributes, and the relationships between the classes
- Interface: Something used to communicate across different mediums
- Unique Key: Used to differentiate entries in a database