SOFTWARE REQUIREMENTS SPECIFICATION

**For**

[**Student Attendance System**

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# Introduction

## Purpose

The following document describes the functional and non-functional requirements for version 1.0 of the Attendance Tracking System. The content is intended for use in the engineering classroom as a guide to commissioning and testing. This software requirements document covers only the core system and does not describe the implementation of the database with which the core system communicates. All requirements in this document apply to implementation version 1.0 unless otherwise noted.

## 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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## Scope of Development Project

The development of the student attendance management system offers wide opportunities for development and innovation. This includes technological integration through RFID, biometrics or mobile applications with the aim of accuracy and user-friendly interfaces. Advanced data analytics and reporting capabilities can provide deeper insights into visitor trends and predictive models. Automation of non-compliance alerts  and stakeholder notification promotes timely intervention. Better communication channels can be created between teachers, students and parents using chatbots or communication systems. The system and its adaptability to different educational levels, seamless integration with existing platforms and strong security measures are critical aspects. Mobile accessibility and feedback mechanisms ensure ease of use and continuous improvement. Integrating AI-based features for predictive analysis and customized strategies enhances the system's effectiveness in managing attendance and enriches the overall training experience.

## 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

## References

* + - Books

 Software Requirements and Specifications: A Lexicon of Practice, Principles and Prejudices (ACM Press) by Michael Jackson

Software Requirements (Microsoft) Second EditionBy Karl E. Wiegers

Software Engineering: A Practitioner’s Approach Fifth Edition By Roger S. Pressman

* + - Websites

[**http://www.slideshare.net/**](http://www.slideshare.net/)

[**https://www.scribd.com**](https://www.scribd.com)

# Overall Descriptions

## Product Perspective

Use Case Diagram of Student Attendance System

*searches*

1

1 *requests*

1

1

1..\*

\*

search\_book



1..\*

check\_limit

check\_availability

User 1

issue\_book

*request\_renew*

<<include>>

*monitors\_request*

1

*monitors\_renew* 1

1

*performs*

*give\_book*

<<include>>

0..\*

1..\*

renew\_book

verify\_member

<<include>>

*take\_book*

1

1 Librarian

Student

0..\*

1..\*

*adds\_new\_book*

*perform\_transaction\_updation*

Staff

\*

\*

return\_book

View\_logs

<<extend>>

add\_book

\*

calculate\_fine

update\_record

This is a broad level diagram of the project showing a basic overview. The users can be either staff or student.. This System will provide a search functionality to facilitate the search of resources. This search will be based on various categories viz. book name or the ISBN. Further the library staff personnel can add/update the resources and the resource users from the

system.The users of the system can request issue/renew/return of books for which they would have to follow certain criteria.

## Product Function

Entity Relationship Diagram of Library Management System



The Online Library System provides online real time information about the books available in the Library and the user information. The main purpose of this project is to reduce the manual work. This software is capable of managing Book Issues, Returns, Calculating/Managing Fine, Generating various Reports for Record-Keeping according to end user requirements. The Librarian will act as the administrator to control members and manage books. The member’s status of issue/return is maintained in the library database. The member’s details can be fetched by the librarian from the database as and when required. The valid members are also allowed to view their account information.

## User Classes and Characteristics

The System usually has three main user roles in a student attendance system: system administrators, teachers, and students. Each user role has specific characteristics and responsibilities. Here is an overview of each user class and their functions:

**Administrator:**

Functions:

Highest access and control of the system. You are responsible for system configuration, settings and general administration. Typically a school or educational institution administrator with authority to manage users, classes, and system-wide settings.

Responsibilities:

Create, modify and delete user accounts. Manage teacher and student information. Configure system settings such as academic calendar, notification settings and security settings. You can view and export comprehensive attendance and system usage reports. Ensure overall system integrity and security.

**Teacher:**

Functions:

Manages attendance of specific classes and students. You can view and update the attendance of the classes you teach. They may have limited administrative capabilities, such as managing profile information.

Responsibilities:

Mark attendance in their assigned classes. View attendance data for these classes and individual students. Manage your profile information. You will receive participation notifications and other relevant information. Work with system administrators on system-related issues.

**Student:**

Functions:

Limited access compared to teachers and administrators. The ability to view your attendance data and possibly other personal data. You may be able to set personal notification preferences.

Responsibilities:

See their own participation information. Update their profile information. You will receive notifications about their participation or other important notifications. Use the system primarily for personal information and notifications. Add books and their information to the database

## Operating Environment

The product will be operating in windows environment. The Student Attendance System is a website and shall operate in all famous browsers, for a model we are taking Microsoft Internet Explorer,Google Chrome,and Mozilla Firefox.Also it will be compatible with the IE 6.0. Most of the features will be compatible with the Mozilla Firefox & Opera 7.0 or higher version. The only requirement to use this online product would be the internet connection.

The hardware configuration include Hard Disk: 40 GB, Monitor: 15” Color monitor, Keyboard: 122 keys. The basic input devices required are keyboard, mouse and output devices are monitor, printer etc.

## 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,
    - teachers and students 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 Library 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 online 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 attendance System
    - Any update regarding the student is to be recorded to the database and the data entered should be correct

## Requirement

Software Configuration:-

This software package is developed using java as front end which is supported by Oracle. MySQL Server as the back end to store the database.

Operating System: Windows NT, windows 98, Windows XP Language: Java Runtime Environment, Net beans 7.0.1 (front end)

,Database: My SQL Server (back end)

Hardware Configuration:- Processor: Pentium(R)Dual-core CPU Hard Disk: 40GB

RAM: 256 MB or more

## Data Requirement

Data requirements for a student attendance system include determining the types of data the system needs to store, process, and manage. The key data requirements for such a system includes User data , Attendance data ,Class and Course ,Notification data ,Authentication log ,External integration data , Settings and Configuration ,User preferences and Security data.

# External Interface Requirement

## 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.

* + - It allows user to view quick reports of their attendance in between particular time.
    - It provides previous attendance data .
    - 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.

Categories View:-

Categories view shows the categories of Attendance system available and provides ability to add/edit or delete category from the list.

# System Features

The users of the system should be provided the surety that their account is secure. This is possible by providing:-

* User authentication and validation of members using their unique member ID
* Proper monitoring by the administrator which includes updating attendance status, showing a popup if the member attempts to edit or add it.
* Proper accountability which includes not allowing a member to see other member’s account. Only administrator will see and manage all member accounts

# Other Non-functional Requirements

## 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
    - Student Attendance 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 data and users without any fault

## 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.

## 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.

## 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

## Business Rules

A business rule is anything that captures and implements business policies and practices. A rule can enforce business policy, make a decision, or infer new data from existing data.This includes the rules and regulations that the System users should abide by. This includes the cost of the project and the discount offers provided. The users should avoid illegal rules and protocols. Neither admin nor member should cross the rules and regulations.

## User Requirement

The users of the system are members and Principal of the university who act as administrator to maintain the system. 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

# Other Requirements

## Data and Category Requirement

There are different categories of users namely teaching staff, Principal, 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 Principal only have the rights to retrieve the information about database. Similarly there will be different categories of classes available. According to the categories of classes their relevant student data should be displayed. The categories and the data related to each category should be coded in the particular format.

## Appendix

A: Admin, Abbreviation, Acronym, Assumptions; B: Business rules; C: Class, Client, Conventions; D: Data requirement, Dependencies; G: GUI; K: Key; M: Member; N: Non-functional Requirement; O: Operating environment; P: Performance,Perspective,Purpose, Principal; R: Requirement, Requirement attributes; S: Safety, Scope, Security, System features; U: User, User class and characteristics, User requirement;

## 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 database
    - 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

## Class Diagram

A class is an abstract, user-defined description of a type of data. It identifies the attributes of the data and the operations that can be performed on instances (i.e. objects) of the data. A class of data has a name, a set of attributes that describes its characteristics, and a set of operations that can be performed on the objects of that class. The classes’ structure and their relationships to each other frozen in time represent the static model. In this project there are certain main classes

which are related to other classes required for their working. There are different kinds of relationships between the classes as shown in the diagram like normal association, aggregation, and generalization. The relationships are depicted using a role name and multiplicities. Here ‘Principal’, ‘Teacher’ and ‘student’ are the most important classes which are related to other classes.

