Software Requirements Specification

for

ATG

(Automatic Timetable Generator)

Version 1.0

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Course: ***MCA III SEM V Track I***

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Contents

Revisions

Version	Primary Author	Description of Version	Date Completed
SRS- ATG Version 1.0	Mufeez Ur Rahaman	This is the initial version of this software project.	00/00/00

1.0. Introduction

1.1. Purpose

The purpose of this project is to ….

- Provide students/faculty/staff with efficient timetable.
- Reduce the manual work of office of academics.
- Reduce the clashes between the faculty timings.
- Eradicate the slot clashes (Backlog/Elective courses).
- Avoid the room clashes.
- Make the application simple, easily understandable, efficient and portable.
- Focus on optimization of resources i.e teachers, labs and rooms.

1.2. Scope of Project

This software system will be designed to ….

- Give access to same online portal for all(students/faculties/staff).
- Users can see their specific processed time table only.
- To suffice Educational Institution Purpose only.
- Provision of altering slots on request of students/faculty.
- Add-Drop Courses: clash notifications
- Modification is much easier and accurate than the manual system

1.3 Constraints:

System constraints are divided into 2 categories:

1. Primary Constraints: The timetable is subjected to the following four types of primary constraints, which must be satisfied by a solution to be considered as a valid one:
    a. A student should have only one class at a time.
    b. An instructor should have only one class at a time.
    c. A room should be busy only for one class at a time.
    d. Some rooms require to have particular equipments. e.g. NKN,projectors.

2. Secondary Constraints: These are the constraints that are of no great concern but are still taken into consideration. They don't need to be satisfied but the solutions are generally considered to be good if they are satisfied.
    a. Courses must be evenly distributed.
    b. Students should not have any free time between two classes on a day.
    c. Scheduling of teachers should be well spread over the week.
    d. Faculty should not have consecutive classes.

1.4 Assumptions and Dependencies

- Assumption:
  - Admin will provide the data of the courses.
  - Optimum number of rooms are available as per the number of courses and faculty.
  - Users are assumed to already have registered LDAP credentials and thus no need to sign up here.
  - Besides provision of "changing password" is not available here as it uses LDAP credentials.
  - Internet connection is always available.

- Dependencies:
  - Details of the Courses (faculty, number of expected students)
  - Classroom Data (seating capacity, NKN facility)
  - Internet connection

1.3. Glossary

Term	Definition
Schedule	An ordered list of times at which things are planned to occur
Database	The collection of the data to be used for the generation of Time Table
NKN	National Knowledge Network
User	Person who uses the software system(Admin, Faculty, Student)
Admin	Person in the administration who uses the software system to create Time Table
Faculty	Instructor for the courses mentioned in the Time Table
Student	Person registered for the courses mentioned in the Time Table
Master Timetable	one containing all courses' timetable for all students and faculty ,not specific for a particular user

1.4. References

IEEE. *IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications.* IEEE Computer Society, 1998.

- Research papers : Journal of Engineering Research and Applications
- Web: www.ijera.com, www.kent.ac.uk/timetabling

- Others : International Journal of Computer Applications Volume 127

1.5. Overview of Document

The rest of the document is designed in the following way:

2.0. Overall Description

2.1 System Environment

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2.2 Functional Requirements Specification

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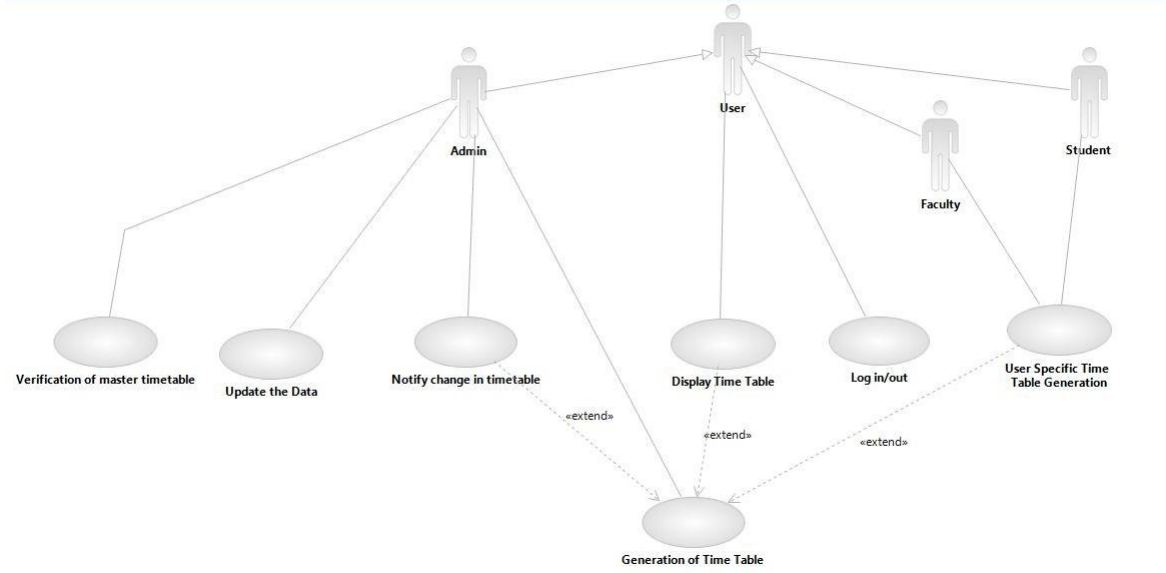
2.2.1 Use case 1

Use case: **Generation of Timetable (Interface)**
Diagram:



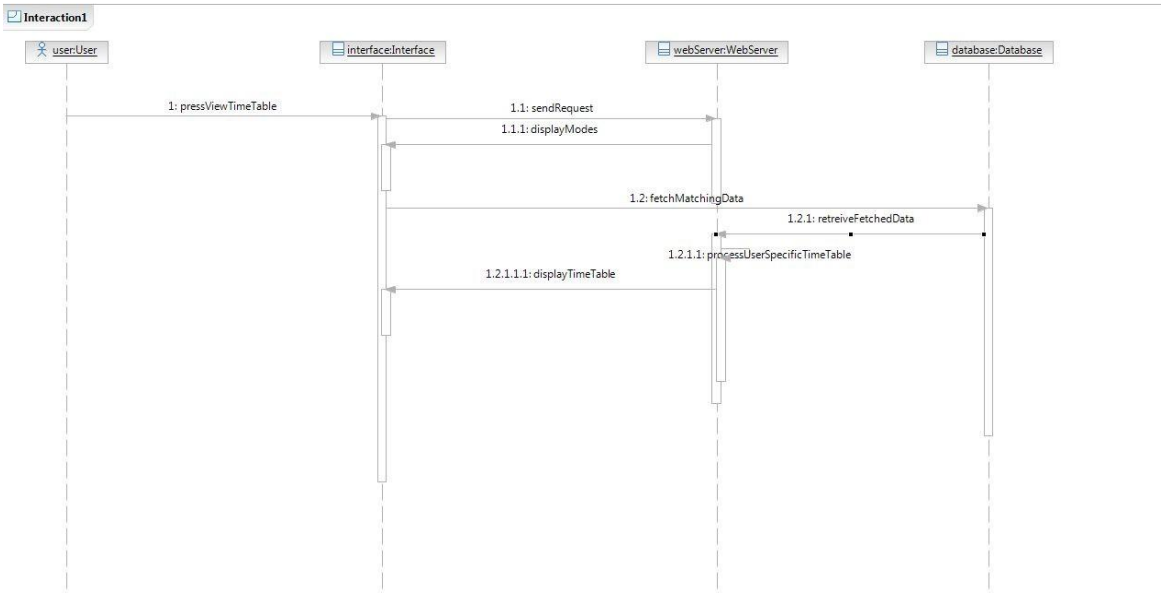
Brief Description
This use case diagram describes what are the functionalities a user can have in the system.It considers all users point of view.

Initial Step-By-Step Description

Sequence Diagrams

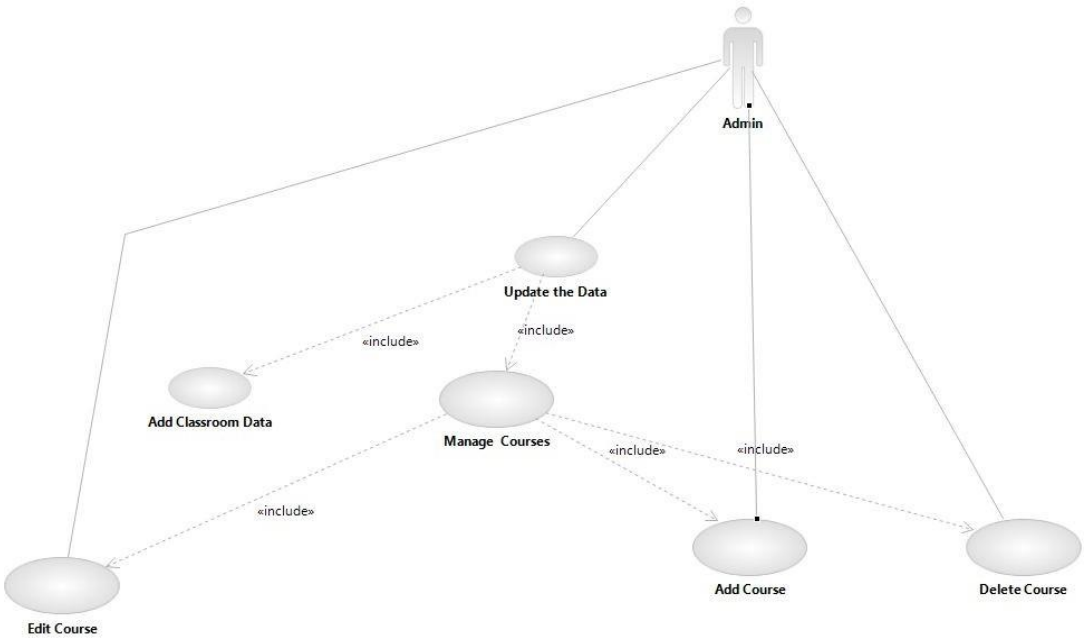
1.Login

2.Display Time Table



2.2.2 Use case

Use case: **Update Data**
Diagram:



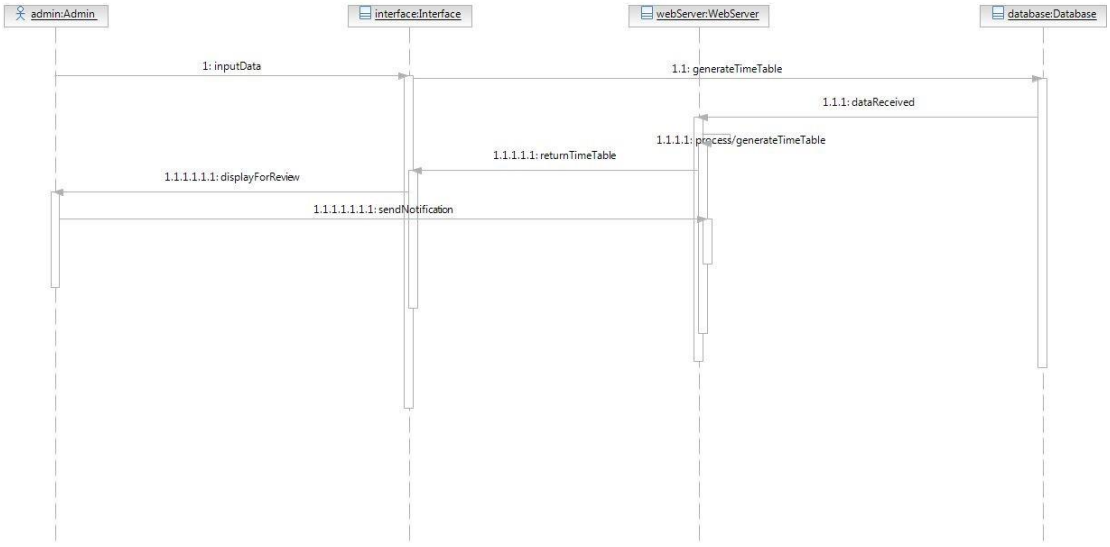
Brief Description

This use case diagram describes about updating course and Classroom data in given database .Only admin can update this data.

Initial Step-By-Step Description

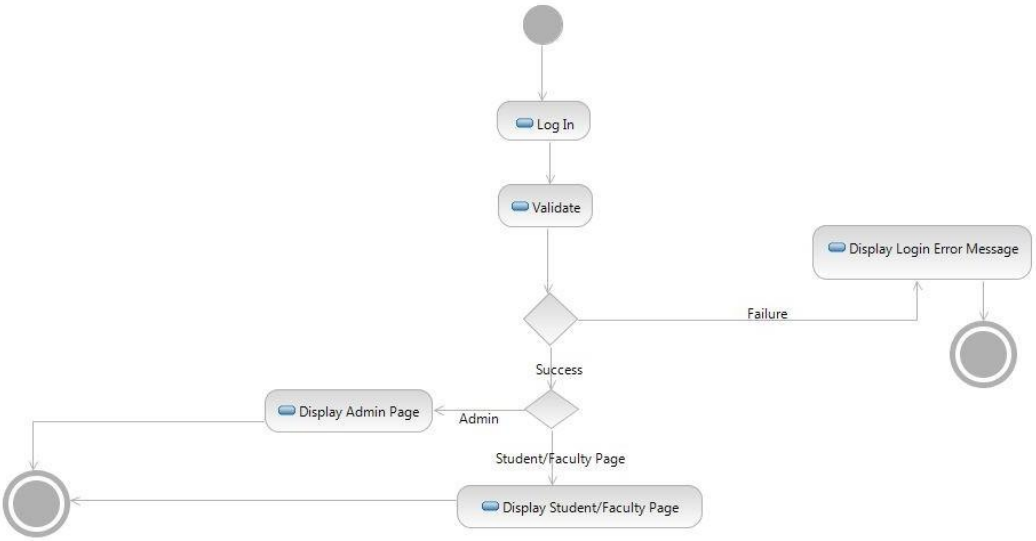
Sequence Diagram

1. Update Data

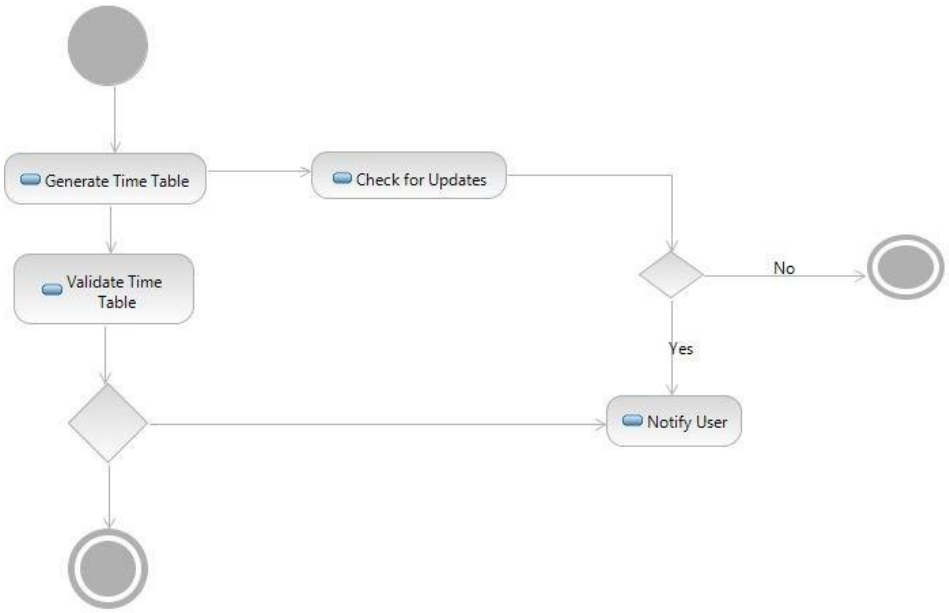


Activity Diagrams

1. Log in



2. Generate timetable and notify



2.3 User Characteristics

The user of this software system requires the following skills to use this software:

- General Internet skills.

2.4 Non-Functional Requirements

- Safety
- Reliability
- Availability

3.0. Requirements Specification

3.1 Functional Requirements

3.1.1 User Log in

Use Case Name	User log in
Trigger	Nil
Precondition	User has already registered
Basic Path	1. User will enter the required credentials and system will validate it. 2. If the credentials are correct it will redirect it to concerned interface.
Alternative Paths	
Postcondition	User will be logged in.
Exception Paths	If the credentials are wrong, show an error message
Other	

3.1.2 Update Data

Use Case Name	Updating the data
Trigger	
Precondition	System has the Database
Basic Path	Admin enters the insert Query to add course in the Database
Alternative Paths	
Postcondition	Course is added
Exception Paths	Course already exists
Other	

MANAGE COURSE :-

3.1.3 Add Course

Use Case Name	Adding Course to the Database
Trigger	Admin presses the “Add Course” key
Precondition	System has the Database
Basic Path	Admin enters the insert Query to add course in the Database
Alternative Paths	
Postcondition	Course is added
Exception Paths	Course already exists
Other	

3.1.4 Delete Course

Use Case Name	Deleting Course from the Database
Trigger	Admin presses the “Delete Course” key
Precondition	System has the Database
Basic Path	Admin enters the delete Query to delete course from the Database
Alternative Paths	
Postcondition	Course Deleted
Exception Paths	
Other	

3.1.5 Edit Course

Use Case Name	Editing the existing Course in the Database
Trigger	Admin presses the “Edit Course” key
Precondition	Course already exist in System Database
Basic Path	Admin enters the alter Query to edit course in the Database
Alternative Paths	
Postcondition	Course Edited
Exception Paths	Course does not exist
Other	

3.1.6 Add classroom data

Use Case Name	Add classroom data
Trigger	Admin presses the “Add classroom data” key
Precondition	Admin has the classroom data
Basic Path	Admin enters the insert Query to add classroom data in the Database
Alternative Paths	
Postcondition	Classroom data added
Exception Paths	
Other	

3.1.7 Verification of master timetable

Use Case Name	Verifying master timetable
Trigger	Master timetable is displayed to the admin
Precondition	Master timetable is generated
Basic Path	Admin verifies the master timetable
Alternative Paths	
Postcondition	Master timetable is verified
Exception Paths	
Other	

3.1.8 Generation of Timetable

Use Case Name	Generating timetable
Trigger	Admin presses the "Generate Time Table" key
Precondition	System has the data of all the courses and faculties in the Database
Basic Path	Software will use algorithm on the Data to create the optimum Timetable.
Alternative Paths	Nil
Postcondition	Automated timetable is generated
Exception Paths	
Other	

3.1.9 User Log out

Use Case Name	User Log Out
Trigger	Presses the logout button
Precondition	User has to be already logged in
Basic Path	1. If the user presses the log
Alternative Paths	logout based on time limit crossed without any activity or time out
Postcondition	Successfully Logged out
Exception Paths	Network problem
Other	

3.1.10 Notify change in Timetable

Use Case Name	Notifying the change in timetable
Trigger	A change is made in time table
Precondition	Timetable exists
Basic Path	Admin sends e-Mail to every user having the new Timetable
Alternative Paths	
Postcondition	Users are notified about the change in timetable
Exception Paths	
Other	

3.1.11 User specific Timetable generation

Use Case Name	User specific Timetable generation
Trigger	General timetable is confirmed by the admin.
Precondition	A general timetable has been generated
Basic Path	1. System takes data of every student and the respective courses. 2. According to the courses and students, generate their timetable.
Alternative Paths	
Postcondition	User specific timetable is generated
Exception Paths	
Other	

3.1.12 Display Timetable

Use Case Name	Display the timetable
Trigger	User presses the “View Timetable” button
Precondition	User logged in and generated Timetable exists
Basic Path	Software fetched the generated Timetable from saved memory
Alternative Paths	
Postcondition	Timetable is displayed to the user
Exception Paths	
Other	

3.3 Detailed Non-Functional Requirements

- Reliability: As the system provide the right tools for discussion, problem solving it must be made sure that the system is reliable in its operations and for securing the sensitive details.
- Safety: Information transmission should be securely transmitted to server without any changes in information.
- Availability: If the internet service gets disrupted while sending information to the server, the information can be send again for verification.

3.4 Logical Structure of the Data

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Database Tables

Tables	Description
Faculty and Student Tables	Store Faculty and student details, which include Username and Password. It also stores administrator's Username and Password.Faculty and student will be able to view own details, while the administrator can update and edit all the lecturer and student details(except username and password).
Classroom Table	Store all the class details of. Only the administrator are allowed to insert, update and delete the data in the tables
Course Table	Store all the course details of. Only the administrator are allowed to insert, update and delete the data in the tables

4.0 Supporting information

4.1 Table of contents and index

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4.2 Appendices