Software Requirements Specification

for

Time Table Management System

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Chapter 1

Introduction

1.1 Purpose

Our project which is entitled as "Timetable Management System" is implied to generating Timetable planning handle in colleges or in any other teach which could minimize the human work and maximize the proficiency and the timetable was stored in a centralized server which might be simple to get to all over.

1.2 Problem Definition

Preparation of time table manually is cumbersome and human errors may be possible which includes wrong allotment or multiple allotment to same faculty or same class at same time. Also a lot of human resource and time is consumed and an error free schedule is also not guaranteed . This software guarantees feasible solution which is guaranteed to be error free. Time Table Scheduling is an NP-hard problem and hence polynomial time verifiable using genetic algorithm. This web based application generates a time table that satisfies the all the conditions to be met. This software generates an error free time schedule which makes unique time table to each faculty and class room , also it checks the constraints of room allotment . It also let faculties and students view their respective time table by logging in to the system . This software allows users to generate time table for newly occurring changes in less time, with less effort and with more efficiency.

1.3 Intended Audience and Reading Suggestions

The intended reader groups for this software Requirement Specification are students of the college and the other faculty members.
1.Students: Students who are enrolled in the different courses for a semester under the various faculties .
2. Faculty : To get to know their own time table on demand .

1.4 Product Scope

The purpose of this smart website system is to create a convenient and easy to use system where each student and faculty member can access to their time table schedule and provides complete information about it.
The scope of the system includes Generation of Timetable, Access the available Timetable(s), Modify/Delete an existing Timetable. Add/ Modify Faculty details of a department. Add/ Modify Semester wise subjects details. Add/Modify time scheduling and period allocation process and room / location of classroom where lectures / labs/ tutorials need to take place.

1.5 Document Conventions

DB	Database
JS	JavaScript
API	Application Programming Interface
HTML	Hyper Text Markup Language
CSS	Cascading Style Sheets
ER	Entity Relationship
UML	Unified Modelling Language
CRC	Class Responsibility Diagram

Chapter 2

Overall Description

2.1 Product Perspective

The project was envisioned taking in mind the importance of a fully functional website to make viewing and modifying time tables for the faculty and students easier subject to satisfy all the constraints . It also decreases loads of human efforts involved in developing time table of each faculty members and each semesters that satisfies all the hard and soft constraints which would otherwise take many days to come up with . The project can be considered as a replacement of human efforts involved and ease their work and also come up with a solution in a very short period of time in comparison .

2.2 Product Functions

The project serves the following major functions:

1. Project provides an interface for the logging in by different roles i.e. as Admin , as faculty member and as student with respective credentials.
2. If logged in as Admin , it can modify the constraints , alter and edit the time table and generate a new time table .
3. If logged in as Faculty member , it shows the time table of the concerned faculty member only.
4. If logged in as student , it shows the time table of the concerned student only given his semester in which he is studying.

2.3 User Classes and Characteristics

- **Student** :
  - Student is studying at IIIT Allahabad .
  - Student can enter his/her credentials and can view the time table accordingly .
- **Faculty** :
  - Faculty is teaching at IIIT Allahabad .
  - Faculty can enter his/her credentials and can view the time table accordingly .
- **Admin** :
  - Admin should have knowledge of database .
  - Admin should enter the course details , faculty details and semester details classroom details and add to the database.
  - Admin creates , edits , modify and generates the time table.

2.4 Operating Environment

This product is a website designed to be compatible with different types of browsers and on various different platform . It is compatible on different type of operating systems on pc like windows , linux etc as well as on mobile devices like various versions of android , ios . It is compatible to various mainstream browsers used such as chrome , firefox and opera mini and the likes of it .

2.5 Design and Implementation Constraints

Constraints are limitations that are outside the control of the project team and need to be managed around. They are not necessarily problems. However, the project manager should be aware of constraints because they represent limitations that the project must execute within.

- **Hard Constraints**
  1. A classroom is not assigned to more than one lecture at the same time.
  2. An instructor cannot teach more than one class at the same time.
  3. Courses for the same year-session students of a department cannot take place at the same time.
  4. The classroom for a course should have enough capacity to take students registered in the course.
  5. The classroom should be well equipped with required facilities for the classes
- **Soft Constraints**
  1. The lectures are not assigned to time slots, which are in the instructor's forbidden time zones.
  2. Instructors daily lecture hours should be restricted to be within the allowed maximum hours.

Chapter 3

External Interface Requirements

3.1 User Interfaces

The entire section can be viewed in 3 different world, which are : teacher, student, and admin . Each of which will be having unique property in our software. These are shown below for each of the respective fields:

3.1.1 Starting Interface

3 icons (or buttons) will be displayed with the heading time table management system.Then each button followed by a click event listener where these brings us down to our desired perspective.

3.1.2 Teacher

A teacher can have the following characteristics in our time table:

Has to login into the portal, or if is a new one will have to register into the portal for successful display.

After successful authentication, a teacher can view/ edit the time table based on his/her convenience.

A teacher can publish an announcement, he/she can also change or edit the current announcement.

3.1.3 Student

A student don't need an authentication , once clicked student he/she will automatically be redirected to the time table page (or menu).

A student has no right to modify the time table. A student can only view the contents of the

time table and can also view the announcement made by the respective teacher in the time table forum.

A student can select the semester out of the option available in the option pane and select one of those to get his/her time table.

3.1.4 Admin

An admin is the main head of the authority, so his view first needs to be authenticated and be checked from the list of predefined members in the database , if successful then redirect to the time table page, else ask him to login again displaying proper message of invalid login.

An admin can add or remove or edit the credentials of any faculty or a teacher in the database, once a teacher registers into the portal , admins task is to verify it and allow the successful append of information of that teacher into the database, if allowed then the teacher can login else cannot.

3.2 Hardware Interfaces

For the purpose of smooth functioning of the software it can work on any systems even with minimum requirements, since our application will be web based application ,so it will be more biased to the newer browser versions, so using internet explorer is not recommended for the proper view since it doesn't support modern CSS like CSS3 and other notable javascript.For efficient working recommended processor : Intel dual core or above, RAM : can even work in 500mb of RAM . Since our technology is web based, we focus on working more inclined towards the cloud technology for enchancing our software even in lower version of PCs.

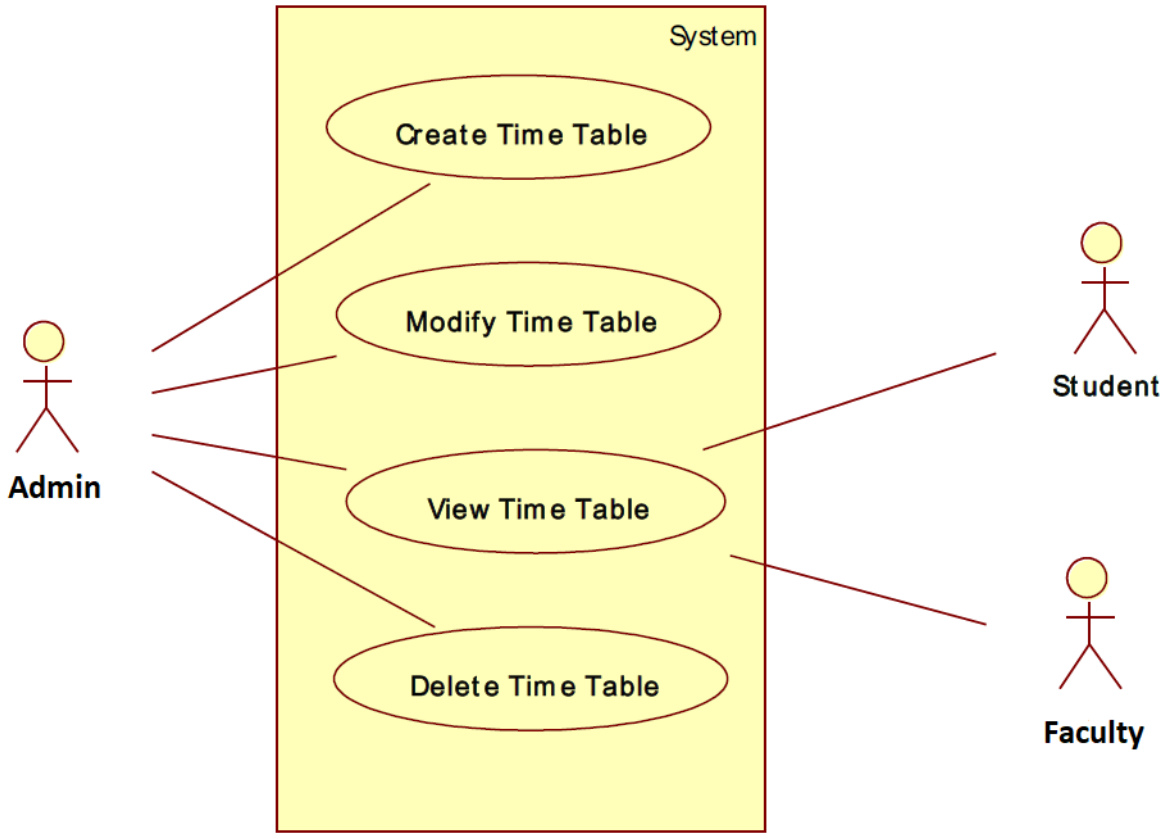
3.3 Software Interfaces

Software Interfaces includes more towards working with web technologies like Node.js (A javascript framework for back end), ,for the purpose of front-end development we will be using it via embedded javascript engine (ejs) for node which seems much of the same as HTML, CSS and bootstrap, and also for the purpose of database we will be using MySQL ,since the algorithms that is being used in the above is a NP Hard problem for automatic generating the time table, so it needs to implemented , implementation will be done in java using the genetic algorithm for automatic scheduling of time table, and also for the purpose of connecting the java code with the web based application we will be using the Java servlet provided which comes as a tool for appending the web based services with java.

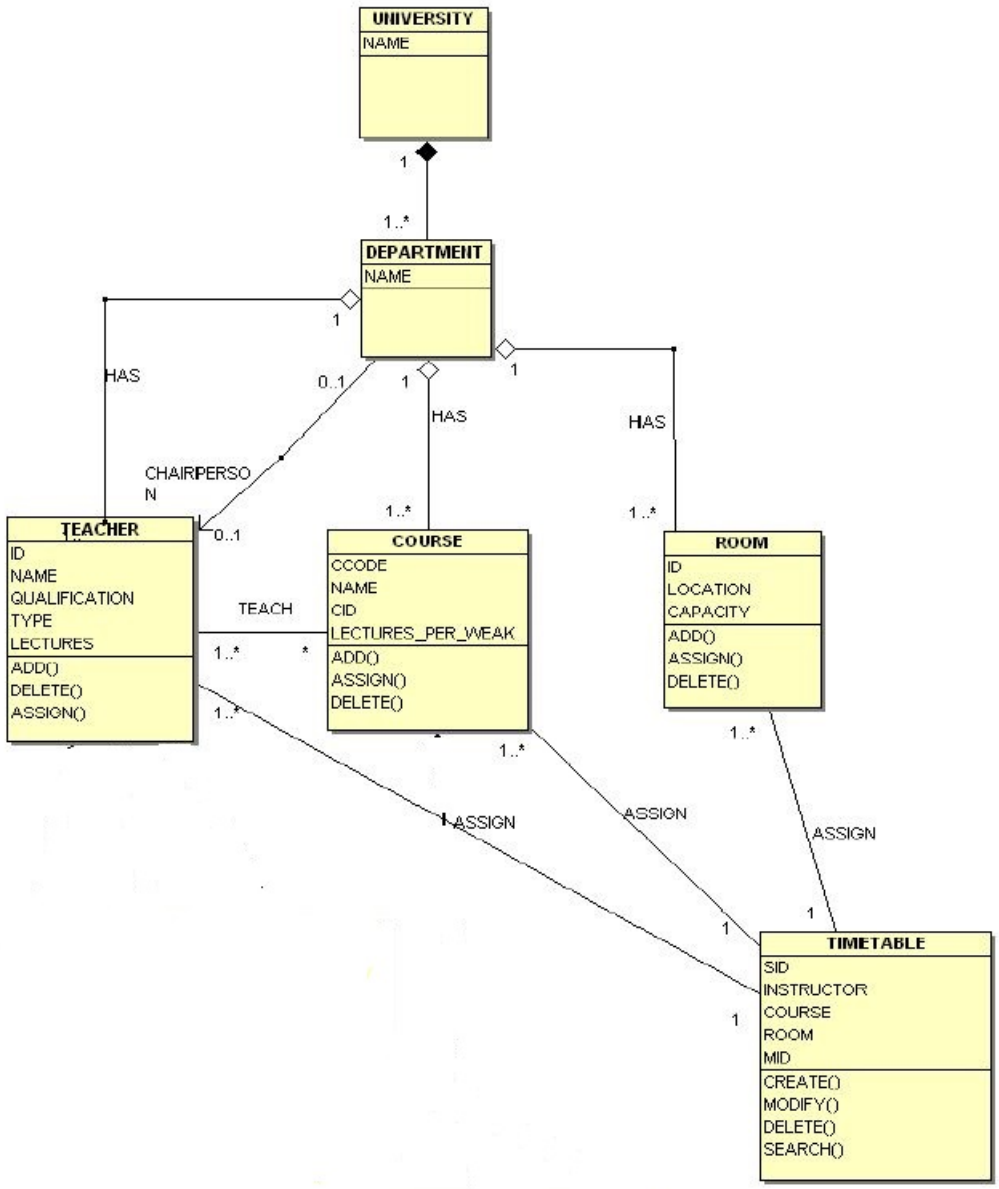
Chapter 4

UML and ER Diagrams

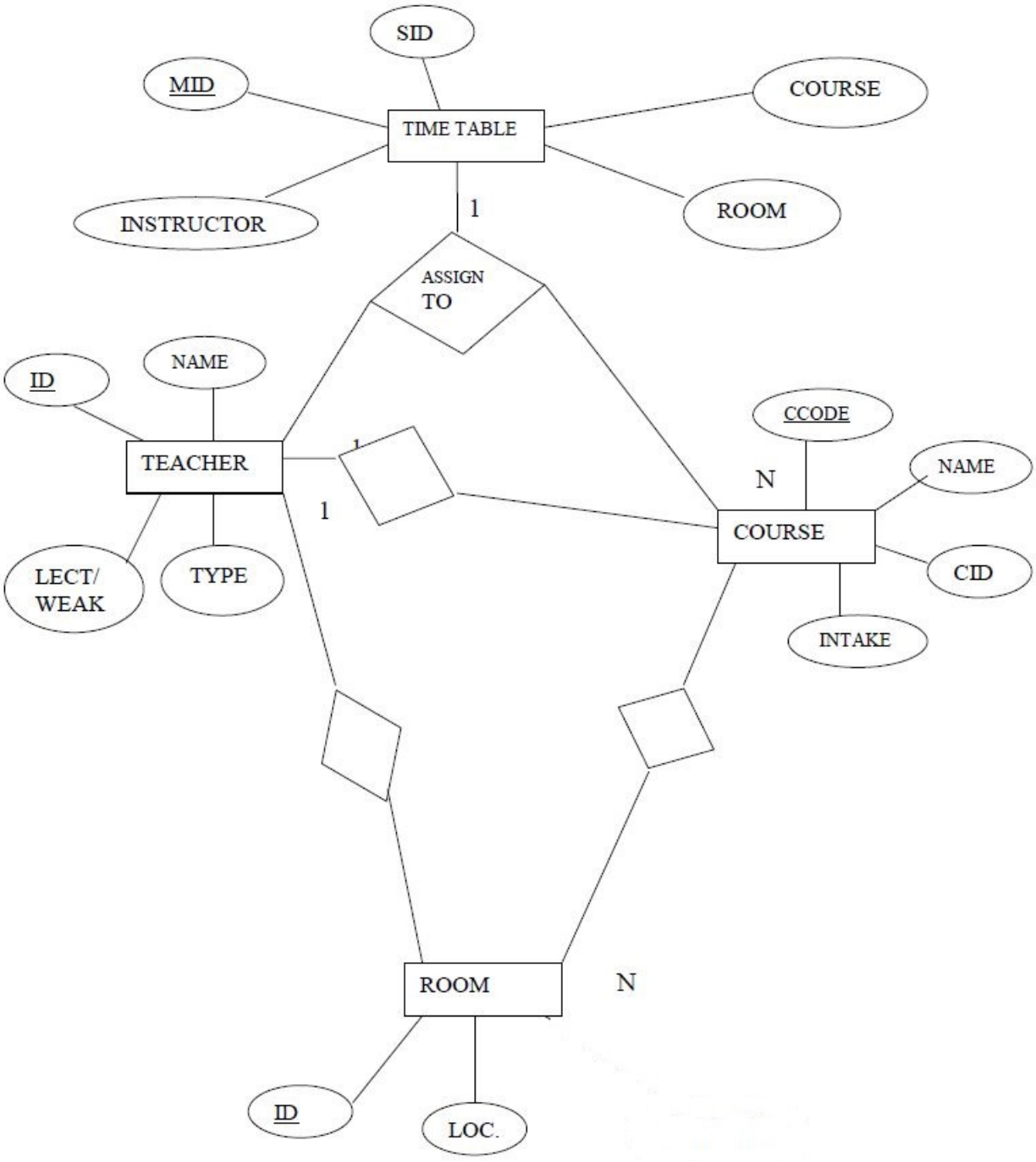
4.1 Use Case Diagram



4.2 CRC Diagram



4.3 ER Diagram



Chapter 5

Other Nonfunctional Requirements

5.1 Performance Requirements

The response time must be quick to extend convenience. Too, the associations between MySQL database server, webpage and web servers must be smooth without any idleness to avoid the misfortune of information and keep the stream of utilization going.

5.2 Safety Requirements

The framework is secured because it will as give access to approved users. It'll have legitimate login framework which is able require client id and password. The database is secured from SQL Injection methods with the assistance of private keys and a SSL/TLS key encryption.This guarantees that all information passed between the internet server and browsers stay private and indispensably.

5.3 Security Requirements

It is more secure than the current websites because it is not only ensured by the encryption of institute's servers but also by SSL/TLS encryption which can halt SQL Infusion endeavors .The database cannot be modified by the client and as it can only be done by the admin of the website. The key web administrations security necessities are confirmation, authorization, information security.In the proposed site verification is required for getting to information through legitimate channels. Faculty and Students need to authorise their login using login id and password. It is only after the authentication that they can access the information on the website.Data is ensured employing a private key which uses SSL encryption.

5.4 Software Quality Attributes

5.4.1 Adaptability

Since there will be three distinctive roles for this extend, the framework will adjust itself for the utilize of those distinctive roles by inquiring for endorsements.

5.4.2 Correctness

- It will create and modify tha data on the database correctly.
- It ensures that only authorised person should get the access.

5.4.3 Reusablity

- Codes are written in such a way that is can be used again for similar projects or projects which have the similar functions.
- It ensures that any modifications to the website or database can be easily implemented.

5.4.4 Availability

This website is designed for the faculty and the students of IIITA.

5.4.5 Testability

- Testability of the software includes the correctness, validity and completeness check.
- It requires that all the functions of the software should be tested using the proper test-cases for any errors, and if any it should be corrected.
- It also requires that all the requirements should be satisfied, i.e. all the functions which the end users of the software may require should be implemented properly.