

# **Time table management system of IIT Indore**

## **Software Requirements Specification**

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\*This document gives a detailed requirement specification for effective management of time table of IIT Indore.

## Revision History

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## Document Approval

The following Software Requirements Specification has been accepted and approved by the following:

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# 1. Introduction

“By failing to prepare, you are preparing to fail.” Utilisation of time efficiently is most important in today’s lifestyle. For this, one must have a timetable and must abide by the rules laid with that accompanies it. In this project, we tend to make the time table of our college, IIT Indore as user friendly as possible for the benefit of students, staff and administration. Not only this, we also tend to maintain proper examination datesheet in the database for the clearer and efficient communication so that the students don’t miss any exam due to sheer misunderstandings. Also, this project caters to the room check facility for the teaching staff as well as students of this institution to conduct extra classes, quizzes or seminars at their own will without indulging into formally informing administration by talking to them in person. A short discussion accompanies each requirement, to add the background and framework necessary to explain the functionality. It also describes nonfunctional requirements and other factors necessary to provide a complete and comprehensive description of the requirements for the software. In the development of our software, we tend to follow waterfall model with some changes as and when required.

## 1.1 Purpose

The purpose of this document is to capture, in natural language and at a functional level, the description and requirements of an effective management and development of online time table of IIT Indore making it more user friendly.

The project consists of three parts -

### **1.Time-table accessor and hall ticket accessor:**

To display the time-table on the academic records account of every student.

To enhance examination management by ensuring no impersonation through hall-tickets.

### **3.Room availability checker:**

To check if any room is available at a given time for meetings and various activities.

## 1.2 Scope

More specifically to design and develop a simple and intuitive system which shall cater the daily academic routine of students of different academic groups of our institute, IIT Indore. The system shall provide features to the user of this educational institute to be able to access their specific time table schedule without viewing the whole master sheet, as is done at present. Also, part of different types of groups, share data and documents amongst different users, have this project focusses on hall ticket availability for each student so that there is no confusion left in the minds of the students and the examination date sheet is not misinterpreted. Also, this project caters to the room checking facility for the teaching staff of this institution.

### **Time-table and hall-ticket accessory**

1. It maps the master time-table database to the respective students who registered for the courses.
2. Whenever the time-table is updated, an email of the master time-table is sent to all the students which leads to data overload in case the time-table is changed frequently. This software would reduce the load by automatically reflecting the changes to the respective accounts, once the changes have been done in the database.

3. It improves exam management by introducing hall-ticket which would also include the schedule of the examination.
4. It can only display the time-table which will be stored in the database but doesn't generate the time-table automatically.

#### **Room availability checker**

1. It saves time because manual checking from master time-table is time-consuming and not always accurate.
2. It avoids clashing(which can occur during manual checking) of two events for the same room at the same time.

### **1.3 Definitions, Acronyms, and Abbreviations**

#### **1.3.1 Academic Portal**

Academic Portal is software meant to help facilitate electronic classroom management and provide for electronic grading, assignment submission, discussion, and other learning tools.

#### **1.3.2 System Administrator**

System administrator is a user who is administers over the database and who has the ability to manage courses and make the necessary updates.

#### **1.3.3 Academic Groups**

An academic group is a set of users which can belong to the same course, same department, and same year.

#### **1.3.4 System**

System refers to the existing timetable or a new more effective time table management.

#### **1.3.5 Room checker**

Room checker refers to the software to be build for the easier accessibility to check if any room is available or is vacant at specific time of the year.

#### **1.3.6 Waterfall model**

The waterfall model is a sequential design process, used in software development processes, in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of Conception, Initiation, Analysis, Design, Construction, Testing, Production/Implementation and Maintenance.

#### **1.3.7 Apache Tomcat**

Apache Tomcat is an open-source web server and servlet container developed by the Apache Software Foundation (ASF). Tomcat implements several Java EE specifications including Java Servlet, JavaServer Pages (JSP), Java EL, and WebSocket, and provides a "pure Java" HTTP web server environment for Java code to run in.

#### **1.3.9. SQL Injection**

SQL injection is a code injection technique, used to attack data-driven applications, in which malicious SQL statements are inserted into an entry field for execution.

### **1.3.10 AROL**

AROL stands for Academic Records OnLine.

### **1.3.11 HTML**

It stands for Hypertext Markup Language.

### **1.3.12 CSS**

It stands for Cascading Style Sheets.

### **1.3.13 JSP**

It stands for Java Server Page.

### **1.3.14 SQL**

It stands for Structured Query Language.

### **1.3.15 JSP**

It stands for Java Server Page.

### **1.3.16 JVM**

It stands for Java Virtual Machine.

## **1.4 References**

1. IEEE 830 Template
2. Sample SRS from [www.cse.msu.edu/~chengb/RE-491/Papers/SRSEExample-webapp.doc](http://www.cse.msu.edu/~chengb/RE-491/Papers/SRSEExample-webapp.doc)
3. Database System Concepts Korth, Silberschatz, S Sudarshan 4th Edition
4. R.S. Pressman, Software Engineering: A Practitioner's Approach(6th Edition), McGraw-Hill, 2006.
5. R. Elmasri and S. Navathe Fundamentals of Database Systems( 3rd Edition ) Benjamin Cumings, 1999.
6. I.Sommerville, Software Engineering( 5th Edition), Addison-Wesley, 1996.

## **1.5 Overview**

This is a working document and, as such, is subject to change. In its initial form, it is incomplete by definition, and will require continuing refinement. Requirements may be modified and additional requirements may be added as development progresses and the system description becomes more refined. This information will serve as a framework for the current definition and future evolution of the online academic time table of the some of the brightest minds of this country.

The document starts with the main functionality of softwares developed in this project followed by its advantages and its comparison with the present working system.

It then focuses on all different aspects of graphical interfaces required (user and client).

The next part consists of the non-functional attributes like performance, maintainability etc.

It concludes with the specifications of the database requirements for the softwares.

## **2. General Description**

### **2.1 Product Perspective**

Our software is meant to serve as a platform where management of everyday academic calendar can be carried out conveniently. Our goal is to develop a replacement of the enormous data transfer via webmail for sending out time-table as master sheet used at IIT Indore to making a completely new tab in academic portal for this calendar making it more user friendly. Our task doesn't finish here. We are also making the datesheet of examinations on same lines to encourage more effective usage of hall tickets so that.

### **2.2 Product Functions**

#### **Time-table and hall-ticket accessory**

1. The software provides easy access of time-table by displaying it on the respective students Academic Records Online (AROL) account on the IIT Indore website and notifies the changes done in the time-table.
2. The time-table page also consists of a highlighted scrolling tab showing any recent or new changes made in the time-table.
3. Along with the time-table, it also consists of an option, which on selection would show the hall-ticket of the upcoming examination .

#### **Room availability checker**

1. This software facilitates room checking and booking in advance for various activities including academic, extracurricular and social.
2. The graphical interface consists of an option to enter date and time on which the availability is to checked. As a result, it shows the list of rooms available at the given time. In case unavailability, it shows 'No rooms available'.

### **2.3 User Characteristics**

The users of this software are expected to be Windows literate and to be able to use buttons, drop-down menus, and similar tools. The user are expected to possess their AROL accounts on IIT Indore's academic website and have knowledge of using web browser efficiently. Since this software is making the existing timetable system more user friendly so this software does not expect any additional knowledge from its users.

#### **2.3.1 Students**

Students are the primary users of an academic portal. They are accessing information extracted from the master timetable of their concern. Also, the examination day and timings is accessed by the students efficiently making this a wonderful experience.

#### **2.3.2 Professors**

Professors are the primary users for the room checker facility to conduct extra classes or quizzes time and again at ease without any inconvenience. So professors must must have some basic knowledge of using basic buttons and similar tools.

### **2.3.3 System Administrators**

System administrators are primarily responsible for maintaining the database. They contribute minimally by spending more time modifying the system's configuration and making appropriate updates.

## **2.4 General Constraints**

1. This is only going to be used for mapping the master timetables to the specific time table of student's registered courses only, not for development of timetables.
2. Only the students with AROL accounts will be able to get the direct facility of generated hall tickets.
3. Room availability checking will be available only for checking status of class rooms only if there would not be any scheduled class in case if any seminar will be there then it could give wrong status.

### **2.4.1 User Interface Constraints**

Using this system is fairly simple and intuitive. A user familiar with basic browser navigation skills should be able to understand all functionality provided by the software.

### **2.4.2 Hardware Constraints**

The system should work on most home desktop and laptop computers which support JavaScript and HTML5.

### **2.4.3 Software Constraints**

The system will be intended to run on Firefox 4 and above, Google Chrome 10 and above and Internet Explorer 8 and above. The system work in lower versions as well but it has not been tested in them.

### **2.4.4 Data Management Constraints**

The system will be able to interface with other components according to their specifications.

### **2.4.5 Operational Constraints**

The system is not limited by its operating server in terms of the maximum number of users it can support at a given time. But is limited by the efficiency of the server and regular modifications made in the database.

### **2.4.6 Site Adaptation Constraints**

The component will be adapted to the overarching system at the conclusion of the system creation.

### **2.4.7 Design Standards Compliance**

The system will be implemented in JSP exclusively.

## **2.5 Assumptions and Dependencies**

1. The record is going to be maintained in the database management system for daily and examination timetables so that any change that will be made by the administration will be



reflected to the students and also the constraint will be able to be put it on for room check availability. So it will be dependent on the database present on the server computer.

2. It is assumed that java enabled web browsers are going to be used for opening the web pages containing the time table and hall ticket.

### **3. Specific Requirements**

#### **3.1 External Interface Requirements**

##### **3.1.1 User Interfaces**

The software mentioned runs in any standard web browser and it uses java applets , so java should be enabled in the browser. This software will work smoothly on any average desktop since it just displays the information fetched through the network. It's most part of the user interface will be through the HTML coding on the client side so it will be very flexible to use on the client side. This interface will allow the user to fetch information related to him.

On the other hand the software on the server side is programmed using java and is linked to the database on the server. It will have just standard window. This will allow the admin to enter the data into the database. He will be able to modify the existing data. And he will also be able to check the availability of any room at any time.

##### **3.1.2 Hardware Interfaces**

Since the software runs on the browser on the client side, so it does not need much resources. It will be very compatible and flexible. Any user can use it's feature from any average desktop, mobile, tablets etc.

The software's main functionality is to map timetable to the individuals from a master time table provided in the database, so it will not consume much resources, and it could be run on any average server.

##### **3.1.3 Software Interfaces**

The software uses a browser to run, and in the browser it uses java applets. So the machine on the client side must have JVM or Java compiler to compile java applets and run it on the machine. Any standard web browser will serve it's purpose.

On the other hand on the server side it will need a database and a java compiler on it and rest it can run on it anyways.

#### **3.2 Non-Functional Requirements**

##### **3.2.1 Performance**

As the records of each student will be an individual tuple in the database, the system will be able to support many concurrent users. This statement provides a general sense of reliability when the system is under load. It is important that a substantial number of users be able to access the system at the same time, since time table of the courses registered by the student is important to them. The times when the system will be under the most stress are likely during examination days and start of a semester time. Therefore, it will be designed in such a way that it will be able to handle many concurrent users.

### **3.2.2 Reliability**

The reliability of the overall program depends on the working of the separate components. As the software will be fabricated with utmost care and understanding, one can count on its reliability at any moment of time.

### **3.2.3 Availability**

The system would be available to the client at all times, meaning the user can access it using a web browser, only restricted by the down time of the server on which the system runs. In case of a hardware failure or database corruption, a replacement page will be shown. Also, in case of a hardware failure or database corruption, backups of the database should be retrieved with the MySQL server and saved by the administrator.

### **3.2.4 Security**

Security is an essential part of any software product. Lest, it will be attacked by unscrupulous people and will not survive for a long duration. Keeping this in mind, the software to be developed will be protected against SQL injection. Also, the details can only be accessed after logging in AROL where the password is already stored in encrypted format.

### **3.2.5 Maintainability**

MySQL will be used for maintaining the database and the Apache Tomcat takes care of the site. In case of a failure, a re-initialization of the program is recommended. Regular updation of the database doesn't cause any failure to the system. Hence, low maintenance will also suffice.

### **3.2.6 Portability**

The application is Windows-based and should be compatible with other systems. JSP(Java Servlet Pages), Servlets, HTML, CSS, JavaScript and MySQL programs are practically independent of the OS-system which they communicate with. The end-user part is fully portable and any system using any web browser(preferably Google Chrome) should be able to use the features of the application.

## **3.3 Design Constraints**

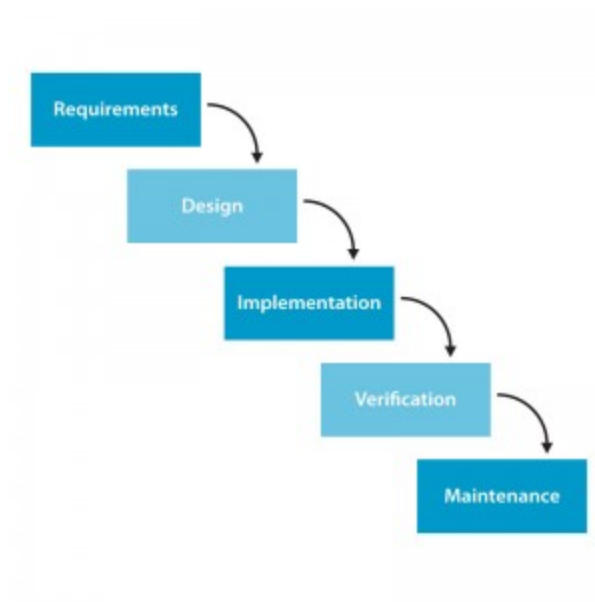
1. The communication between the portal software and the database will be in SQL.
2. The portal layout will be produced with HTML/CSS.
3. The product will be written in JSP, with the intense use of servlets.
4. System administrators must have access to comprehensive documentation and database available.

## **3.4 Logical Database Requirements**

A database will be used for this software to store the data. It should be able to store different data types like string, date, time etc. Since it will just be used to store a master time table along with some other data so its data usage will be very low, it just should be able to pass the information quickly for any query passed.

## A. Appendices

### A.1 Appendix 1



Waterfall model of development of software

### A.2 Appendix 2

