



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



**ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)  
ORGANISATION OF ISLAMIC COOPERATION (OIC)  
GAZIPUR, BANGLADESH**

## ***ROUTINE MANAGEMENT SYSTEM***

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## **DEDICATION**

We, Abdel Salam Abbo (Student Id: 160033403) and Moussa Sali (Student Id: 160033404), dedicate this thesis work to our respective family members and friends for their continuous supports and prayers which enabled us to always be motivated and determined throughout our entire course.

## DECLARATION

This is to certify that the work presented in this thesis is authentic and it is the outcome of an investigation carried out by **Abdel Salam Abbo** and **Moussa Sali** under the direct scrutiny of **A.B.M. Ashikur Rahman**, Lecturer, Department of Computer Science and Engineering (CSE), Islamic University of Technology (IUT). We hereby declare that:

- This documentation or part of it has not been submitted elsewhere for the award of any other Degree or Diploma. Rather, it accounts for the completion of our Bachelor of Science in Technical Education with specialization in Computer Science and Engineering at the Islamic University of Technology.
- All literatures and contributions mentioned here were carefully verified and fully acknowledged by their owners.

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Lastly but not the least, we would like thank our parents who taught us the value of hard work by their own examples.



## **ABSTRACT**

Routine management system (RMS) is a Java based software used to automatically generate timetable. Currently at the Islamic University of Technology, timetable generation follows a manual process. Thus, there is a high probability of making errors in overlapping timetable period or slot and definitely a valuable amount of time is wasted as there are many things to be considered. Routine Management System (RMS) comes with the intension to reduce the workload of the users, facilitate their operational duties and finally save their time. It will help to manage all the periods automatically. The user is only required to set a timetable for a batch and accordingly all related timetables (Teachers, Rooms and Labs) will automatically be set by the system. By using this software, a user can select the VIEW section to view and print each timetable related to a particular batch, teacher, room or lab in an easy and simple manner. Users can manage these modules by adding, dropping and editing them. Routine management system (RMS) also contains an embedded database which stores the records of every batch, room, lab and teacher with their respective timetables. The system is a comprehensive timetable management solution for Islamic University of Technology (IUT) aiming solely to help overcome the challenges in manually setting the academic timetables.

# CHAPTER 1: INTRODUCTION

## 1.1 Overview

Nowadays, most institutions have a number of different courses having one or more subjects. Within the institutions, we find a tremendous number of staff members who are often responsible for conducting classes for one or more subjects. Therefore, an efficient process to schedule their routine is needed to prevent the overlapping of their activities.

At the Islamic University of Technology, there is no such a complete solution present easily or we should say free of cost which allows a computerized management of academic timetables. Routine generation follows a time consuming and stressing process where people need to manually insert academic routines. For example, in the department of Computer Science and Engineering (CSE), setting the routine for a given batch requires the users to insert data about a particular subject along with the information of a specific teacher and the allocated room or lab. Then he reinserts the same information for the selected teacher, room or lab.

## 1.2 Main objective

The main objective of developing Routine Management System is to make the task of generating timetables an efficient and a simple process which will solve the above addressed problem. Another objective is to have an organized, less complex and feasible timetable which can easily be modified to respond to different user requirements. The system is required to be user-friendly in order to ease its interaction with the user. The system should also be flexible enough to accept changes depending on the user's needs.

## 1.3 Scope of the Project

The scope of this project is to implement an interactive system to manage academic timetables at the Islamic University of Technology (IUT). Due to some factors such as time constraints, the scope of Routine Management System (RMS) covers the following functionalities:

- Manage teachers' information (adding, editing and deleting)
- Manage classrooms' information (adding, editing and deleting)
- Manage labs' information (adding, editing and deleting)
- Manage batches' information (adding, editing and deleting)
- Assign classroom starting
- Assign period length
- Assign total number of slots
- Assign break time
- Allow single insertion of timetable information for a specific batch and automatically generate remaining timetable information for the corresponding teacher, room or lab.
- Viewing and printing of timetables in a PDF format.

# CHAPTER 2: SYSTEM ANALYSIS

## 2.1 Introduction

Sometimes referred to as requirement analysis, system analysis is the process of collecting relevant informations regarding any working system with the intention of identifying its strengths, problems and then analyze them in order to produce a new system having better functionalities and less limitations than the evaluated system. In this chapter, we are going to study the actual process of managing academic timetable. Then identify the problems existing in it. Finally, we will propose some solutions to these problems.

## 2.2 Current System

The available method of managing academic timetable in Islamic University of Technology (IUT) is manual. The users make use of papers, pencils and sometimes Microsoft Excel Spreadsheet to generate routines for different batches, teachers, rooms and labs. The current system requires the participation of many users and it is taking a huge amount of time and resources to work.

## 2.3 Problem in the Current System

Since there is no proper software designed to deal with the present needs of users to manage academic timetable, the process of timetable generation will cause the following issues:

- Difficulty to search for a record
- File lost
- Costly utilization of time
- Errors
- Data Duplications
- Data Conflicts

## 2.4 Solution Outline

To overcome the above-mentioned problems, we came up with some ideas as follow:

- Conflict checking: The system will not allow the selection of any resource already available in another timetable
- Efficient algorithm to process users' information in real time
- User friendly GUI with message prompting to ease interaction

## 2.5 Goals and Objectives

- To enable rapid timetable generation
- Dynamic system coping with future modifications or changes
- Ensure consistency of informations
- Allow viewing and printing of timetables

## **2.6 Evaluation of Objectives**

This project intends to develop a system to manage academic timetables with the following objectives:

- General Objective
- Qualitative Objective
- Quantitative Objective

### **2.6.1 General Objectives**

The general objectives are as follow:

- User Login
- Teacher registration
- Batch registration
- Room registration
- Lab registration
- Update teacher entries
- Update batch entries
- Update room entries
- Update lab entries
- Delete teacher entries
- Delete batch entries
- Delete room entries
- Delete lab entries
- Populate Routines
- Download Routine files

### **2.6.2 Qualitative Objectives**

The qualitative objectives of Routine Management System (RMS) are as follow:

- Keep up with technical change
- Save time
- Permanent storage of data
- System protected application requiring valid credentials to operate with it
- Routine Management System of Islamic University of Technology (IUT)

### **2.6.3 Quantitative Objectives**

The qualitative objectives of Routine Management System (RMS) are listed below:

- The system should store the timetable informations for every batch, teacher, batch, room and lab available in Islamic University of Technology (IUT)
- The system should prepare a timetable template any time a new batch, teacher, room and lab is added

- The system should have organize each timetable data entries in group of batch, teacher, room and lab

## **2.7 Salient features**

The salient features of Routine Management System (RMS) are listed below:

- The administrator will be able to add, edit or delete entries for each teacher, room, batch and lab
- Dynamic number of slots specification
- Viewing routine based on criteria (batch-wise, teacher-wise, etc.)
- Printing timetables in a pdf format
- Dynamic setting of period length, class starting time, break time and length

## **CHAPTER 3: FEASIBILITY STUDY**

### **3.1 Introduction**

In this chapter, we will discuss about the feasibility study of our project. We will detail some technical, economic and operational feasibility.

### **3.2 Feasibility Analysis**

#### **3.2.1 Technical Feasibility**

The technical feasibility of our project is determining that whether the technology is available or not, our current technical resources are enough to develop the project or not. Our system will need only available hardware and software. SQLite database does not require any complex configurations or compatibilities issues. NetBeans IDE is free for form designing.

#### **3.2.2 Economic Feasibility**

We have done cost analysis for our system to determine whether the current financial conditions are suitable to implement our system. This investigation led to the following conclusion:

- All dependent facilities are satisfied from open source materials.
- No extra facilities or resources needed to implement our system.

#### **3.2.3 Operational Feasibility**

The following elements are the outcomes of our operational feasibility investigation.

- There is a system administrator who is able to use our application
- The system has a nice GUI with notifications enabled to guide the user
- The system is user-friendly and there is no extra training needed for using it

## **CHAPTER 4: SYSTEM DESIGN**

### **4.1 General Description**

Following the initial requirements analysis, the design phase defines the elements of a system with its components, security model, modules, architecture and the different interfaces and type of data that goes flows in the system.

### **4.2 User Activities**

The following list of elements define the different activities that a user can perform in the system.

- Login: In this section, the user provides his valid username and password.
- Set initial parameters: Here, the user can add or change the parameters of the system like the number of slots, period length, break time, break length, class starting time.
- Managing routines: This functionality enables the user to set routines.
- Managing teachers, batches, rooms and labs records.
- Viewing and printing timetables.

### **4.3 Elements of the project**

Routine Management System (RMS) contains three main elements. They are:

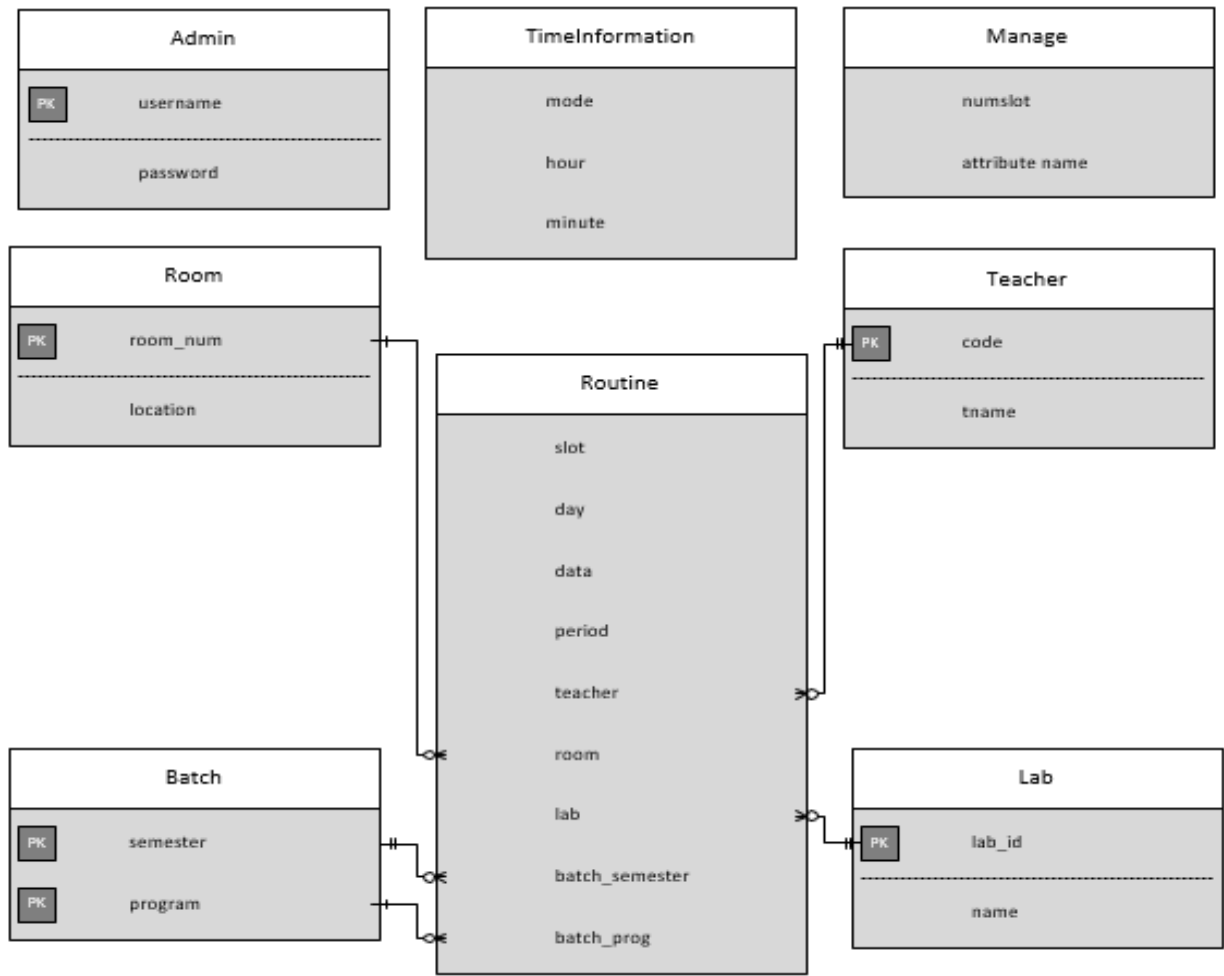
- Input/Output: The inputs are those elements that are sent to the system by the user through the GUI. In RMS, the inputs are the data entered when filling in the forms. The outputs of RMS are the list of teachers, rooms, labs, batches and their respective timetables.
- Process: It is the operation of the system that deals with the steps needed to interpret a given input and provide an output responding to the service requested by the user.
- Control: This is what guides the system by deciding how it can work well. It is the decision-making subsystem that manage the different activities of input process and output.

### **4.4 Functional Requirements**

There are some functional requirements which are very important for interacting with the system. These are:

- The system is set to manage timetable for a single department.
- Allocation of different groups within a batch during the same period of time is ignored.

## 4.5 E-R Diagram





# CHAPTER 5: IMPLEMENTATION

## 5.1 Introduction

This chapter will present our Routine Management System (RMS) highlighting its operational requirements along with a tutorial showing how to operate with it.

## 5.2 Operational Requirements

- ❖ Development tools:
  - Sun's/oracle Java Runtime Environment.
  - SQLite database
  - SQLite connector
  - Itext5
  - NetBeans IDE for coding in JAVA
- ❖ Documentation tools:
  - MS power point
  - MS Visio 2016
  - MS Word
- ❖ Graphical Design tools:
  - Photoshop CS6
  - NetBeans IDE for facilitating the design through drag and drop
- ❖ Hardware requirements:
  - At least 2GB of RAM
  - Hard Disk space with a minimum 320GB
  - CPU – Intel Core 2 Duo

## 5.3 Tutorial

This section will act as a user manual. There will be instructions on how to operate with the system depending on the desired action.

### 5.3.1 Login



Figure 1: Login Page

In this form, the user is required to provide valid login credentials in order to be redirected to the homepage illustrated below:



Figure 2: Home Page

Otherwise, he will not be able to do anything.

### 5.3.2 Parameters Initialization



Figure 3: Parameters Initialization

Here the user sets the different parameters of the system as illustrated in the above figure.

### 5.3.3 Adding teachers, rooms, labs and batches

CODE	NAME
ASA	Abdel Salam Abbo
ASR	ABM Shikur Rahman
MS	Moussa Sali
SS	Sirajus Salekin

Figure 4: Adding Teachers, Rooms Labs and Batches

Here, the user first selects the type of record he wants to insert from the left panel of the window and then provides the necessary informations in the corresponding input fields of the form. The illustration above is an example of managing teacher records.

### 5.3.4 Setting Routines

*B.Sc Semester 2*

Day  
WEDNESD... ▾

Course ID  
Math 4237

Period  
3 ▾

Interval  
1 ▾ - 3 ▾

Location  
 Room  Lab

Location ID  
N201 ▾

Teacher ID  
SS  
ASR  
ASA  
MS

Update

Reset

Day	1	2	3	4	5	6	7	8	9
MON	CSE 4205 SS N201		CSE 4206 SS, ASR Lab 3	CSE 4206 SS, ASR Lab 3					
TUE									
WED	Math 4237 ASA N201	Math 4237 ASA N201	Math 4237 ASA N201						
THU									
FRI									

Figure 5: Manage Routine

This is where the admin performs the desired actions to set timetable after selecting a specific batch.

### 5.3.5 Viewing and printing Routines

Day	08:00-...	08:50-...	09:40-...	10:30-...	11:20-...	12:10-...	14:30-...	15:20-...	16:10-...
MONDAY	CSE 4205 SS N201		CSE 4206 SS, ASR Lab 3	CSE 4206 SS, ASR Lab 3					
TUESDAY									
WEDNESDAY	Math 4237 ASA N201	Math 4237 ASA N201	Math 4237 ASA N201						
THURSDAY									
FRIDAY									

Figure 6: Viewing and printing Routine.

This form shows the different routines available in the system. The user first makes his selection (batch, room, teacher or lab) and then the corresponding timetable will be displayed in the table.

## **CHAPTER 6: CONCLUSION**

In conclusion, Routine Management System (RMS) is a desktop-based application that can be considered useful at Islamic University of Technology (IUT) as it improves the process of generating academic timetables. This software will be of great support in routine generation because there is a great difficulty in managing many faculties' as well as students' timetable in a properly in the current system. However, due to some restrictions, we could not make it a whole system. Therefore, in the future, we plan to add the following functionalities:

- Make the system handle routines for all available department of Islamic University of Technology (IUT)
- Facilitate the insertion of different classes or labs associated with different groups within a batch during the same period of time.

## **REFERENCES**

<http://www.asctimetables.com/>