

# ROOM RESERVATION AND MONITORING SYSTEM: A SMART WEB-BASED RECORDS TRACKING SYSTEM

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**Abstract:** *This paper presents the development of an online multipurpose timetable system that would be beneficial for all the staffs and students related to Universiti Teknologi Mara Cawangan Kelantan (UiTMCK). The system is designed to replace a paper-based process that gradually become unmanageable due to the increasing large volume of data. Features of the new system include online recording of forms, database query functions, electronic authorization, update, manage and monitor the progress data. We also describe the project methodology. The system is implemented on Windows platform using open-source software such as PHP4, MySQL, and Apache. Performance of the developed system is assessed practically and an efficient, and user friendly operation is demonstrated.*

**Keywords:** *Records room management reservation, web based records trading system, system development life cycle*

## INTRODUCTION

Records management is very crucial and highly critical in organizations. The purpose of records management is to ensure that adequate records are created, captured and managed. As mentioned by Currall & Moss (2008), the rapid developments and deployments of new information and communication technology (ICT) globally have lead to increase the number of electronic records and at the same time systematic management system still being implemented. As stated by Thurston (2000), electronic records provides the opportunity for government throughout the world to improve the delivery information and services to citizen and business.

UiTMCK is struggling to keep pace with the implications of ICT developments and deployments. Therefore many web-based application systems are developed to improve the manual record keeping processes. Hence, an observation is conducted, regarding a booking process of classroom which is done manually. Based on the observation, it is shown the importance of a flexible web-based application system that can properly manage booking records of classrooms. Thereby, a web-based system named as Room Reservation and Monitoring System (RRMS) is developed in order to provide an online system that effectively and efficiently fulfill staff requirements as well as to simplify the manual booking process.

The RRMS is an online booking facility that facilitates technician or administrators of Information Technology Unit (INFOTECH) and lecturers to book classroom at any time and

in any places. It checks conflicts and allows simultaneous bookings, updates of bookings, changes and deletion as well as monitoring of bookings.

The system allows the administrators to manage classroom reservation such as booking, recording, scheduling, reporting and maintenance effectively as compared to manual way. The RRMS allows for calendar view of the entire classrooms in UiTMCK ranging from academic building at block A up to block D. It gives daily, weekly and monthly views of the calendar. The RRMS can be accessed directly through UiTMCK's website by intranet as well as internet.

## **BACKGROUND OF THE ORGANIZATION**

Information Technology Unit (INFOTECH) is one of the main units that is responsible for managing facilities and ICT infrastructure on the campus of UiTMCK. This unit is placed under the administration but starting May 2009 it was placed under the Division of Academic affairs. It has two sections which are ICT and Audio Visual (AV) section.

## **VISION**

To realize the use of ICT in learning, teaching and administration by applying the latest techniques and technologies in the development of ICT infrastructure in UiTMCK.

## **MISSION**

Implementing, strengthening and stabilizing technology through infrastructure development, learning, teaching and application of ICT in the academic and administrative staff.

## **ANALYSIS OF CURRENT SYSTEM**

The problems analysis are the process of understanding the real problem happened and what the user or customer needs and propose the solutions to meet those needs. By analyzing the problems, these can gain a better understanding towards the problems itself. Listed below a few problems with the manual booking system:

### **Implementation of scheduling manually**

The procedure for booking a classroom is done manually. Staffs especially lecturers who wish to reserve a classroom need to go to INFOTECH to fill a form to book a classroom. Sometimes the administrators did not have enough time to check and update the bookings especially on ad-hoc cases.

### **Booking entry through paper**

Other problem also occurred when a booking is overlooked by the administrators because all the booking entries are recorded on papers. Missing entries or unconfirmed entries are affected the booked classroom and cannot be highlighted because there are no official approved document pertaining to the previous booking process.

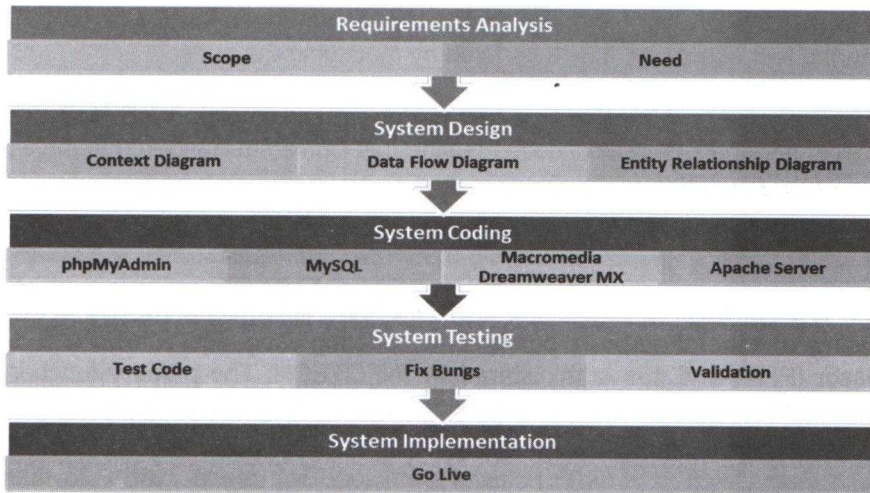
### **Miscommunication**

Miscommunication always occurred, especially lecturers who booked a classroom for a test or a replacement class but need reconfirmation whether the booking is approved or need to be rescheduled. This situation usually happened when the administrators

are not at the counter. The lecturers need to go to the counter again and check for other available classrooms.

## PROJECT METHODOLOGY

Based on the extensive problems of the manual-based implementation, a new web-based system named as RRMS is suggested to be developed to replace the previous system. System Development Life Cycle (SDLC) model is implemented as a logical steps used by a programmer to develop RRMS. The steps are schematically shown as in Figure 1.



**Figure 1 : System development life cycle for room reservation management system. (Adapted from Karim, Saad and Haque, 2011)**

**Requirements Analysis:** In the first phase, the scope and the needs of the RRMS are defined by compiling a detailed list with a clear description of application features and the requirement software and hardware. Initial meetings with the technicians/administrators and lecturers were conducted. Besides, detail information such as existing reports, documents, forms and standard operating procedures which are related to the class booking process are viewed.

**System Design:** After the requirement phase, naturally comes the design part of the application. In this phase, structured analysis is used to view the system from the data flowing through it. This phase consists of the following diagrams:

- *Context Diagram (CD):* This diagram is designed as a simple representation of the entire RRMS. It is shown how the RRMS received and sent data flows to the external entities involved which are the people who are booking the classes, technicians and system administrator.
- *Data Flow Diagram (DFD):* A detailed overview of all processes and data flows in RRMS which is highlighted in major internal processes data flows and data stores. It also repeated the external entities and data flows that are appeared in the context diagram.
- *Entity Relationship Diagram (ERD):* A design of RRMS that is based on a conceptual database as viewed by end user. It is depicted database's main components such as entities', attributes' and relationships' of RRMS. Figure 2

*System Coding:* After the design phase, the configuration features and the specifications are converted into codes by using several tools such as:

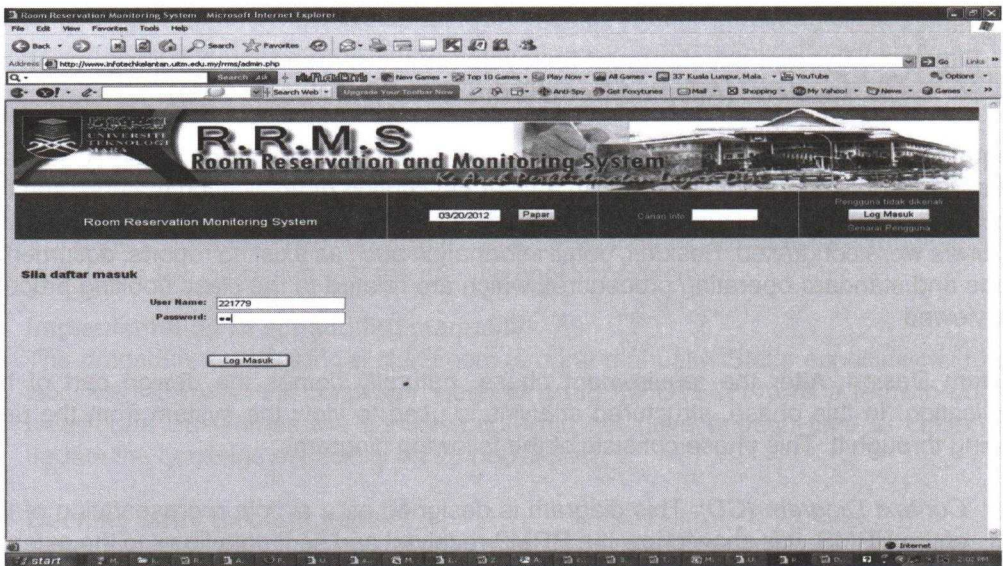
- phpMyAdmin is used to develop the codes.
- MySQL is chosen as the software to store data into database.
- Macromedia Dreamweaver MX is used to design the interfaces.
- Apache Server is used as web server software to initial growth of the World Wide Web for RRMS.

*System Testing:* After the system coding phase, RRMS is tested by executing the code in various conditions (for example using different browser) as an effort to detect all application bugs and fix them before the final release. Each page and each feature is tested. If a bug is found during test execution, it is to be fixed by modifying the code.

*System Implementation:* After the final test is done, the complete of RRMS is installed into the server and the RRMS is accessed using this Universal Resource Identifier (URL), <http://www.infotechkelantan.uitm.edu.my/rrms>.

## PROPOSED SYSTEM

The RRMS is developed as a solution to the manual implementation. It is a web-based system using a general-purpose server-side scripting language known as Hypertext Preprocessor (PHP) and it is administered by INFOTECH. The primary function of this system is the capability to display the bookings of a particular classroom in the specific academic block.



**Figure 2: Page for administrator and user authentication**

Administrators of the system are able to monitor future activities of each classroom. Lecturers and students can refer the valid timetable from administrators.

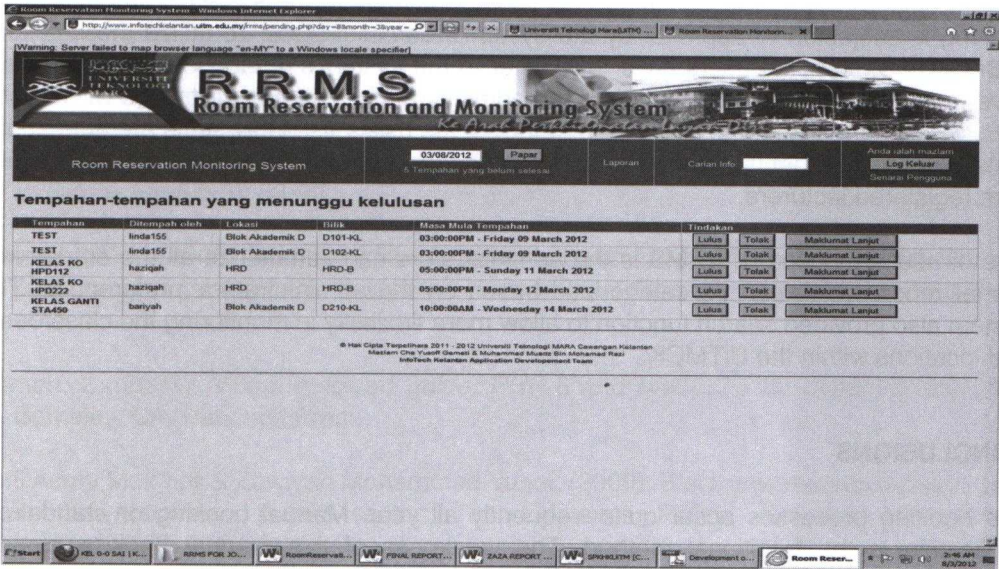


Figure 3: Page for administrator to manage the bookings

Other feature of RRMS is its function to enable registered users to reserve a room for their future activities. A prime example would be a lecturer can book a location for his/her replacement class ahead of time. The system is structured on the policy of allowing a minimum of 3 days ahead for booking a location. This is to give ample time for the administrators to evaluate the status of the booked class, approve and make the necessary preparations before the intended time of the booking. Before any entry can be made for a vacant classroom, users are required to submit an online. The form is stored into the system's database.

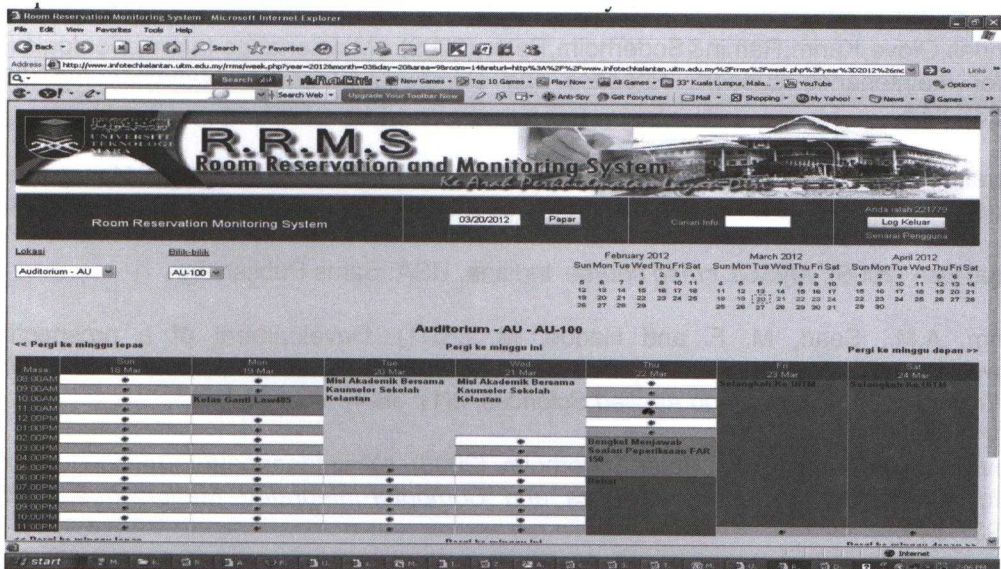


Figure 4: Page for user to make a booking process

The information about the booking is be posted instantly in the system's timetable. The booking is subjected to approval by the system's administrators. To utilize the functions of the RRMS, first time users have to register to the system's database. First time users have to submit personal information to the administrators. The administrators will register the users into the system to avoid redundancy in the users' list. Only staffs are able to use the system and students are not permitted to use the system unless granted permissions from registered lecturers.

One of useful function of RRMS is the administrators can summarize all the entries into a brief report which can be categorized based on the administrators' preferences. The system also provided search function to allow more flexibility in monitoring the classrooms and locations within the UiTMCK.

## CONCLUSIONS

The booking processes occur quite frequently all year. Manual booking or standalone application is the traditional method. The weakness of this manual booking system may be faced by the user such as inability to make reservation and share information simultaneously online. It also does not permit multi user environment. The proposed system Room Reservation Monitoring System (RRMS) is considered a necessity as the current manual system causes many problems. The system can assist administrators in effectively and efficiently manage the room reservations. The semester schedules can regulate more conveniently and in real time. Clashes between normal classes and booked activities can be avoided. The project is considered very relevant. The RRMS can contribute significantly to the campus. Consequently, time and cost savings as well as data quality can be achieved.

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