

LABORATORY MANAGEMENT SYSTEM

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ABSTRACT

Nowadays, many application system use online system to interact with the user. It is because online system has many advantages rather than using manual system. Laboratory Management System is an example of online system that will be develop for lab administrators to manage the labs. In this project, several modules will be applied to the lab management system. All these modules are choosing based on the lab administrator and user request. This project has its objectives and problem statements that give the reason why this online system should be develop. Before developing the project, the developers should make a plan that consist the objectives, problem statements, scopes, and methodology including the system analysis, system design and system requirement that will used. All these components will helps the developers what should they develops and how to develops the system.

ABSTRAK

Hari ini, banyak aplikasi sistem komputer menggunakan sistem atas talian yang digunakan mengikut keperluan pengguna. Hal ini adalah kerana sistem atas talian memiliki banyak kelebihan daripada menggunakan sistem manual. Sistem Pengurusan Makmal adalah salah satu contoh dari sistem atas talian yang akan dikembangkan untuk menolong pembantu makmal menguruskan makmal komputer dengan lebih berkesan. Dalam projek ini, beberapa modul akan diterapkan dalam sistem pengurusan makmal. Semua modul ini dipilih berdasarkan permintaan pembantu makmal dan permintaan pengguna. Projek ini mempunyai objektif dan laporan permasalahan yang tersendiri yang memberikan alasan mengapa sistem pengurusan makmal atas talian harus dibangunkan. Sebelum membangunkan projek ini, para pemaju perlu membuat rencana yang terdiri dari objektif, rumusan masalah, liputan projek, dan metodologi termasuk sistem analisis, sistem desain dan keperluan sistem yang akan digunakan. Semua bahagian ini akan membantu pemaju apa yang harus mereka kembangkan dan bagaimana projek ini perlu dikembangkan.

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CHAPTER 1

INTRODUCTION

This chapter briefly discuss on the overview of the research that includes introduction, followed by the problem statements, objectives of the system, scope of the system, and the organization of thesis.

1.1 Introduction

Laboratory Management System or Lab Management System is an online web based application that manages several tasks of Faculty of System Computer and Software Engineering (FSKKP) laboratories at University Malaysia Pahang (UMP). This system will manage several modules in FSKKP laboratories such as lab booking, equipments borrowing, lab maintenance, disposal, report the use of lab and

staffs work schedule. FSKKP only have manual system that manages these modules before. So, this system will be developing to help the lab administrators to set up and manage the labs easily using the online web base application.

FSKKP laboratory is one of the facilities that had provided by University Malaysia Pahang to help students practice the theories that have been thought in lecture. FSKKP has 18 laboratories and has provided a total of 418 computers and 35 iMac with an average of 32 computers per lab. The labs are all located at block X, Y and M close to lecture halls. Each laboratory devoted to the subject provided by faculty like CCNA lab (FSK2 and FSK11) used for CCNA Networking subject, Operating system lab (FSK6B) used for Operating System subject and Apple iMac Graphics lab (FSK14 and FSK15) is used for multimedia and graphics subject. These laboratories are managed by 4 Vocational Training Officer assisted 5 other assistants. The software installed on computers in each lab differs based on the usage specifications of the lab. For example, CCNA lab was provided with software and devices that will be used by students majoring in computer systems and networking.

Generally, this system will be developed using web based technology to make the several modules in that system more structured and systematic beside can make the lab administrator easier than before. Hypertext Preprocessor (PHP) language will be used to develop the system interface and connect the interface with the database that will store recorded data. So, this method will make the user easy to access by using web browser application. Lab administrator will record each task into the system to enable data to be stored into the database and to make the troubleshooting work easier if there are errors when recording the data.

This system also can be upgrade by adding more module if there are new modules need to be recorded into this system that related to the FSKKP laboratories. So, this system quite important to the FSKKP Technical Unit to make the lab management at UMP more advance than other universities.

1.2 Problem Statements

Problem statement is the description of an issue currently existing which needs to be addressed. This problem provides the context for the research study and generates the questions which your research aims to answer. The laboratory management system (manual system) has several problems. The problems that have been facing for a past year are:

- 1) Hard to manage the task in different location by using manual system. For example, the user such as staffs and students must go to the resources room to booking the lab.
- 2) The recorded data easily lost if the lab administrators use the manual system. So, this issue will create another big problem to the lab administrators.
- 3) Lab administrators hard to troubleshoot and repairing lab equipment if there are certain devices damage in labs when using manual system.

1.3 Objectives

A goal or objective is a projected computation of affairs that a person or a system plans or intends to achieve a personal or organizational desired end-point in some sort of assumed development. It is roughly similar to purpose of aim, the anticipated result which guides reaction, or an end, which is an object, either a physical object or an abstract object, that has intrinsic value. Meanwhile, this project embarks specific objectives as follow:

- 1) To develop the manual lab management system into online web base lab management system.
- 2) To develop several modules in online Lab Management System such as equipments booking, warranty and items disposal, and lab booking.
- 3) To help the lab administrators easy to manage the data, troubleshoot and repairing damage equipments in laboratories.

1.4 Project Scopes

Project scope is the work that needs to be accomplished to deliver a product, service, or result with the specified features and functions. The scopes of this project are:

- 1) The scope of this project is at University Malaysia Pahang (UMP) only.
- 2) This system is developed based on Faculty of Computer System and Software Engineering (FSKPP) laboratories and members only.
- 3) This system only consist three modules only which are laboratory booking, laboratory equipments borrowing, and warranty and repairing laboratory items.

1.5 Project Organization

This thesis consists of six (6) chapters. Chapter one (1), discuss on introduction of this project. This chapter has several parts such as introduction, problem statement, objectives, scopes and thesis organization.

Chapter two (2) is literature review that will explain the previous projects that have been done on baseline on-line system. This chapter consists of two parts, i.e., studies on current or existing system and explains about hardware and software requirement that have been used to implement this project. For this chapter, the related information can get via book, internet, article, journal and others.

Chapter three (3) is methodology. This chapter will discuss the proposed approach and the entire draft of the project that taken in the development of this project. It also will explain the justification of the proposed approach, hardware and software requirements. This topic also explains project development that has designed.

Chapter four (4) is implementation. This chapter discusses about the environment used and coding used to develop the system. It also contains some of the coding like the engine for the system.

Chapter five (5) is result and discussion. This chapter briefly discusses how the system runs. System testing will be showed here if got any error or not. The system must have error handling and user friendly.

The last chapter will be the conclusion which will summarize the results of this project. It also presents the summarization of project's methodology, implementation that has used, and finally suggestion for possibility to enhance this project for the future research.

CHAPTER 2

LITERATURE REVIEW

This chapter briefly explains about the manual process laboratory management system in University Malaysia Pahang and background of the project studied is stated. The other aspect that will be discussed included comparison with the similar existing systems.

2.1 Introduction

Faculty of System Computer and Software Engineering (FSKKP) is one of the faculties at University Malaysia Pahang. The objectives of this faculty are to produce knowledgeable, high skilled and competitive graduates within the sphere of software engineering, computer and computer network and graphics and multimedia.

The faculty is currently among the best IT program in Malaysia for its quality of education, softskills and technology based skills. Before the year 2009, FSKKP only have three programs which are computer systems program, computer science program and software engineering program. In 2009, a new course majoring in Multimedia and Graphic was introduced by the faculty to increase the number of students who enter the field of IT.

Laboratory is one of the FSKKP facilities that had provided by UMP to help students practices the theories that have been thought in lecture. Originally, FSKKP has 15 laboratories and has provided a total of 358 computers with an average of 32 computers per laboratory. The laboratories are all located at block X and M close to lecture halls. These laboratories are managed by 4 Vocational Training Officer assisted 5 other assistants. The addition of a Multimedia and Graphics program has resulted in faculty add another laboratory block, block M and add over 60 computers and 35 iMac. So, this additional will make the Vocational Training Officer (PLV) and Vocational Training Assistance Officer (PPLV) more hard and complex.

There are several modules in the laboratory management system used by PLV and PPLV to manage the laboratory such as laboratory booking by FSKKP member, borrowing laboratory equipments, laboratory booking by other faculty or other association, disposal of the laboratory assets, and the warranty and repairing of laboratory equipments. Some modules such as laboratory booking, and borrowing laboratory equipments are commonly requested by students and staffs. They should follow the laboratory policies and procedures that have been provided by FSKKP before PLV and PPLV approve and record the applications to make the system work smoothly. The other modules such as disposal of the laboratory assets and repairing and warranty of laboratory equipments need fully control by PLV and PPLV without any request from the user. All these modules will be recorded by PLV and PPLV into Laboratory Log Books and will be display on the white box that located at each laboratory blocks. PLV and PPLV need to be always update the information in the log book and display it on the white board. The laboratory policies and procedures will be discussed in the manual system topic.

This title had been suggested by Mr. Abdullah Bin Mat Safri. And the interview with one of the Technical Department staff, Mr. Kirahman Bin Ab Razak had been done.

2.2 Manual System

Vocational Training Officers and Vocational Training Assistant Officers are the main persons that control all the FSKKP Laboratory Management System in UMP guided by Head of Technical Unit. The current Laboratory Management System that has been used by PLV and PPLV is only the manual system. This manual system operates by recording all data in the laboratory log book and will be shown on a white board in each block. Procedure and policy for each module in the manual system will be discussed in the subtopic below.

2.2.1 Borrowing Laboratory Equipments

This module aims to provide laboratory equipment borrowing services to associates, students and society at the Faculty of Engineering Faculty of Computer Systems (FSKKP) and UMP (Limited). Each user should be follows all the borrowing rules and procedure to make sure there are no mistakes during recording the information [1]. Application for rental of laboratory equipment can be made by memo or e-mail or letter of application before three working days from the date of borrowing and need to get support from the head of FSKKP technical unit. PLV and PPLV will be inform the rules or terms and conditions of loans to applicants before filling the log book of FSKKP Laboratory Equipment Borrowing Records. The

borrowing period that allowed is not more than two weeks for each period of the borrowing. The late returning of equipment at the prescribed date will be charged a fee of RM 0.50 per day. The borrower is responsible for safety and cleanliness of all equipment. Any loss and damage to the equipments, the borrower will be responsible to replace the similar equipment [2].

Using web based technology, this manual system module will change into web based application that allowed applicants or user to enter their information in the application form and will send it to PLV or PPLV. Then, PLV or PPLV will approve the application if all the information from user is completed. If the information does not complete, PLV or PPLV will inform the user the complete the application. This method will make the Borrowing FSKKP Laboratory Equipment easier to manage without asking the user to send memo, or meet the PLV if they want to borrow some equipments from FSKKP laboratory.

Figure 1 show the flow chart of manual FSKKP Laboratory Borrowing Equipment [3] procedures that has been described before this.

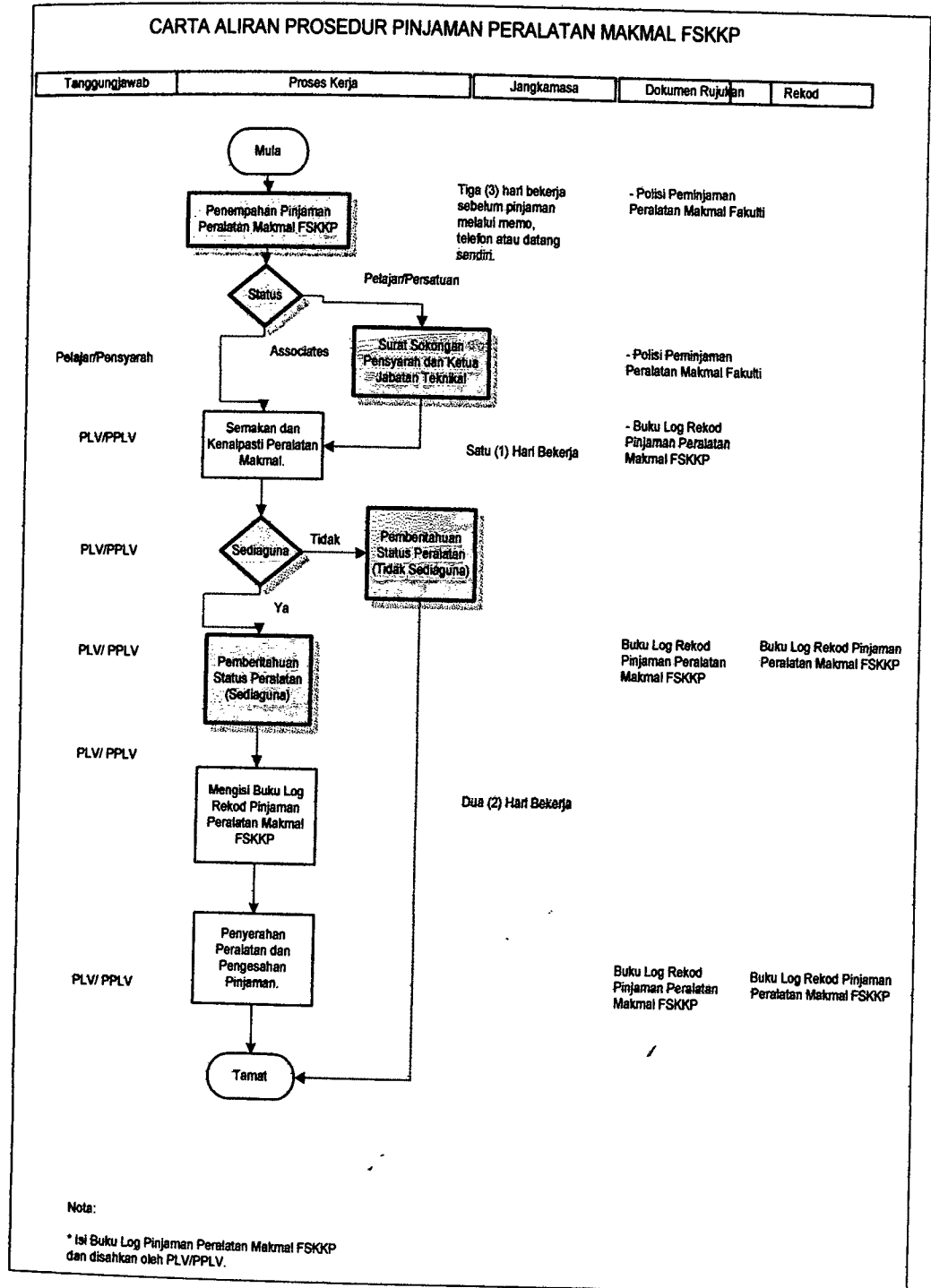


Figure 2.1: Flow Chart of Manual FSKKP Laboratory Borrowing Equipment

2.2.2 Laboratory Booking By FSKKP Members

This module aims to provide the laboratory facilities for the user. Some students or association need to use laboratory for their own purpose such as, substitution class, surfing internet, complete assignments and so on. The user should follow each term and condition according to FSKKP Laboratory Booking Policy provide by FSKKP when booking the laboratory [1]. Reservations can be made by memo, e-mail or letter of application, seven working days before the date of the use of laboratory. For internal users (faculty members) reservations can be made by memo, e-mail or letter of application three working days before the date of the use of laboratory. All reservations must be entered into the laboratory log book by PLV or PPLV. The information should be record include the date of reservation, date of use, metric number and user signature. This log book should be kept well by PLV or PPLV at least for one year for future reference. If time and applied laboratory inappropriate, PLV / PPLV will propose other suitable date and time, if the user agrees, then the reservation will be accepted. If no appropriate date requested, the user should be discussed with the Head of Technical Unit. PLV / PPLV will update the latest reservation that has been made to avoid any conflict. Students or the Association, who wish to cancel their booking must inform the PLV / PPLV through memos, phone or come to the laboratory FSKKP one working day prior to the use of the laboratory [2].

Using Web based technology, this manual system for lab booking management system by FSKKP members or other faculty members will allow the applicants to fill the application form in the web based application. So, the applicants should not make the reservation by memo or meet the PLV / PPLV if they want to book the laboratory. PLV / PPLV will check the date and time of the reservations and approve the reservation if the reservation's time and applied laboratory appropriate. Then, the data from the application form will automatically store in the database. PLV / PPLV can check the approved reservation in the application reports. So, this web based system will help the PLV / PPLV and user easy to make any labs reservation.