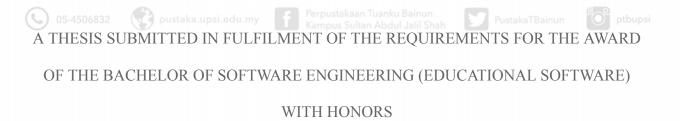# LABSYS: ONLINE SCHOOL LABORATORY MANAGEMENT SYSTEM FOR SECONDARY SCHOOLS

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FACULTY OF ART, COMPUTING & CREATIVE INDUSTRY

UNIVERSITI PENDIDIKAN SULTAN IDRIS

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LABSYS: ONLINE SCHOOL LABORATORY MANAGEMENT SYSTEM FOR

SECONDARY SCHOOLS

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Tarikh

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(Prof. Madya Dr. Hjh. Nor Hasbiah Binti Ubaidullah)

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First and foremost, all praise be to Allah S.W.T., the Almighty, for providing me with the blessing, the strength, the opportunity, and the endurance to complete this final year project, LabSys: Online School Laboratory Management System For Secondary Schools.

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ABSTRAK

Projek ini adalah mengenai pembangunan LabSys: Sistem Pengurusan Makmal Sekolah Dalam Talian Untuk Sekolah Menengah. LabSys ialah sistem berasaskan web makmal dalam talian yang boleh membantu Pembantu Makmal menguruskan makmal dan Guru menempah sebarang inventori dan makmal yang ada. Projek ini dijalankan dengan memilih reka bentuk dan antara muka yang sesuai untuk memastikan akses ke dalam sistem pengurusan makmal akan lebih mudah untuk Pembantu Makmal dan Guru. Faktor yang perlu diambil kira ialah bagaimana Guru boleh menempah makmal dan alatan yang diperlukan tanpa membuat tempahan secara manual di makmal dan bagaimana Admin Makmal dapat menyusun dan menguruskan semua inventori di makmal tanpa masa yang terhad. Model ini dibahagikan kepada empat peringkat: pembangunan spesifikasi abstrak, pembinaan sistem prototaip, penilaian sistem prototaip, dan penghantaran sistem. Metodologi memastikan penyelidikan dan pembangunan produk diuruskan untuk dijalankan secara tetap dan objektif tercapai. Kebolehgunaan projek ini akan dijalankan menggunakan teknik kuantitatif untuk menguji dan menilai keberkesanan LabSys. Diharapkan projek LabSys: Sistem Pengurusan Makmal Sekolah Dalam Talian Untuk Sekolah Menengah ini akan membantu mengurangkan kerja Pembantu Makmal dan Guru.

LABSYS: ONLINE SCHOOL LABORATORY MANAGEMENT SYSTEM FOR SECONDARY SCHOOLS

ABSTRACT

This project is about the development of LabSys: Online School Laboratory Management System For Secondary Schools. LabSys is an online laboratory web-based system that can help Lab Admin to manage the laboratory and Teacher to reserve any available inventory and lab. The project is carried out by selecting the suitable design and interface to ensure the access into the laboratory management system will be easier for Lab Admin and Teacher. The factor that needs to be considered is how Teacher are able to book the laboratory and tools needed without manually booking it at the laboratory and how Lab Admin are able to sort and manage all the inventory in the laboratory without limited time. This model is divided into four stages: development of abstract specifications, construction of prototype systems, evaluation of prototype systems, and delivery of a finished system. The methodology ensures that product research and development are managed to carry out on a regular basis and that the objectives are met. This project usability will be conducted using quantitative techniques to test and evaluate the effectiveness of LabSys. It is hoped that this project, LabSys: Online School Laboratory Management System For Secondary Schools will help to lessen work of Lab Admin and Teacher.

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INTRODUCTION

1.1 Introduction

Through the years, school laboratories have played a very crucial role in the development of students' analytical processes. Many research results show that practicum and laboratory activities are significant in helping students with practical work. School laboratories have a significant role in supporting the learning process in schools, especially for science learning such as physics, biology, and chemistry. This means that the management and maintenance of the school laboratory is an important part of daily work as lab administrator.

LabSys: Online School Laboratory Management System For Secondary Schools is the system that will be created special for laboratories to solve all of the problems including management of information, reservation lab and equipment and storing data. LabSys will have a function for lab administrators to manage inventory data by editing,

deleting or adding the details. While the teacher will be able reserve the lab and all the equipment in the laboratory also view the inventory. Lab admin will be able to see the details of the reservation that had been requested by the teachers.

The idea to create this system was created when many researchers were doing analysis of a laboratory in school in Malaysia that does not have any internal system that controls all the information. In the end, with the concept of innovation and technology, this system will be created with a combination of systems with the latest concepts of database.

1.2 Research Background

A laboratory is a room or building that is set up for science experiments, research, or teaching, as well as the production of medicals or chemicals. Although, research by Nyoto Suseno, Partono, Riswanto, Purwiro Harjati and Dedy HA (2018) proves that many school labs have not been effective in helping the process of learning until now. Laboratory work feels very complicated is the main reason that leads to the lack of effectiveness of laboratories in supporting the learning process of the students. Most of the school laboratories in Malaysia still practice the traditional way of managing the documentation and management of the laboratories logistic. Current laboratory work feels very complex and complicated, so it requires a strong and persistent force where much administrative work has to be done in laboratory management, according to Suseno, et al. (2014). So this manual and traditional way is obviously inefficient and not systematic enough. This is because traditional ways make the data of inventory and lab management difficult to arrange and find. Therefore, the concept of a database

management system is applied as an initiative to help manage the documentation of laboratories in the school.

1.3 Problem Statement

Nowadays, computer-aided technology is widely used in the management and maintenance of school laboratories due to the rapid development of computer technology. But there are still many schools that still use manual systems that contain weaknesses because of human error such as not adequate and orderly because there were no professional and persistent human resources in managing the school laboratory. This traditional way also will lead to communication between the teachers and the laboratory administrators being limited. Because the teacher must prepare his practicum tools and also contact the lab admin to use the lab in order to implement the practicum with their students, this resulted in less interest and motivation among teachers to use the laboratory.

The laboratory is one of the standard facilities and infrastructure that must be met by each education unit, according to the RI Minister of National Education Regulation No. 24 of 2007. As a result, the government has attempted to meet the needs of the school laboratory through procurement. As a consequence lack of systematic systems will cause the laboratory equipment and materials to have not been well arranged and the data management is not well documented. Therefore, the online management system proposed in this work can reduce and optimize the work of the laboratory administrator and also help the teacher to use the laboratory without any difficulty.

1.4　　　Research Objectives

The following are the research objective of this project:

1. To identify the requirements needed in the database management system and inventory for schools' laboratories.

2. To develop a database system - LabSys that gives access to the teachers and lab admin of the laboratory management, tools and chemicals without limited time.

3. To evaluate the ease of use of the system to teachers to reserve the equipment and session to use the laboratory.
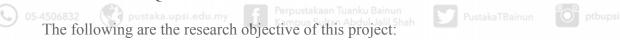
1.5　　　Research Questions

The following are the research objective of this project:

1. What are the requirements needed in the database management system?

2. How to develop a database system that will give access to teachers and lab admin?

3. Does the system easy to use for the teachers to reserve the session in the laboratory?

1.6   Scope of the Project

Focus of this project is on the studies on the development of the database which aims to build a management system for school's laboratories. In order to achieve the objectives of the project, the scopes of work are identified as:

1. This system will be focusing on laboratories in secondary schools where they will use it often for their practical activities.

2. The main function of this system is to make sure that school laboratories can be used to facilitate student learning and run more optimally, effectively, and efficiently for teachers and lab administrators mainly.

3. The system will provide a list of details of the materials and equipment that will be inside of each of the laboratories. The details can be updated by lab administrators at any time and anywhere.

4. The system also will provide a page where teachers can fill in the details to reserve the session to use the laboratory. The lab administrators will be updated with the reservation details to prepare the suitable equipment for the session.

5. This system will be developed using phpMyAdmin, create a database server using XAMPP server and Visual Studio Code to create the programming language.

1.7   Significant of the Study

1. Students will enjoy their learning session in the laboratory.

   Secondary school students will have suitable equipment and material in the laboratory to complete their practicum without any obstacles by waiting for the lab admin to prepare it.

2. Teachers will be motivated to give a lesson and make demonstrations to the students.

   All the teachers that need to use the laboratory to instruct students will be motivated to give a lesson about a certain topic that includes practicum.

3. Will benefit the lab admin to manage and keep track of everything about the laboratory.

   Help the laboratory admin to arrange the session for the class and prepare suitable equipment and material for the students to do their practicals. Also help the lab admin to manage and organize all the inventory and equipment that is available in the laboratory.

1.8   Summary

LabSys: Online School Laboratory Management System For Secondary Schools is about providing information and access to laboratory admin who want to see and update information about the laboratory and teachers to reserve the session for lesson purpose. Other than that, this system also provides detailed information about the equipment and inventory in the laboratory. Finally, this system can be a proactive method of improving and supporting the learning process in schools, especially for science learning.