Laboratory Inventory System

N. M. Z. Hashim[1], N. A. M. M. Arifin[2]

[1, 2] Faculty of Electronics & Computer Engineering, Universiti Teknikal Malaysia Melaka,
Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia

Abstract: ***There are a lot of forms to be completed as the inventory process happened. Many systems had been introduced to manage and place the inventory items to be in a systematic ways. The proposed project was about laboratory inventory that will be used as a system at Faculty of Electronics and Computer Engineering (FKEKK). The project will be known as the Laboratory Inventory System (LIS). This system focused on recording and updating the data. It is also have a report in the system which will make user easier to check the current status of the each equipment and component in the laboratory. Besides, this system development was based on forms oriented that were used by the technicians and staffs before. This new system also used database concept to store all the information which related with land application processes. The methodology which has been used to guide this project development is RAD (Rapid Application Design) methodology. The problem of the current system of the Laboratory Inventory System (LIS) had been analyzed and from that, requirement analysis had been made. The results show that the main objective to develop the fully functional software that fulfills all the criteria needed is successfully achieved. This system is hoped to be developed with an external source uploaded which can upload the laboratory information from another source files help.***

Keywords: Database, Graphical User Interface (GUI), Inventory System, Laboratory

1. Introduction

For a conventional system in product inventory, lots of forms and books were used to list out inventory and the data are written manually. The data can suddenly misplace or even lost. For future use, this conventional system should be replaced with a user friendly and more systematically system. Nowadays, there a few of organization are still using some of manual system in recording the data processes. The system has been improves since the introducing of Laboratory Inventory System. Basically, the previous LIS is using file maker software. It is easier to use file maker but still this method produce unreliable, less user friendly and not full systematically system.

This project will be developed using PHP (PHP: Hypertext Preprocessor), Adobe Dreamweaver S3 linking with database that using SQL (Structured Query Language) as the language or instruction of the system to make it as a standalone system [1]. The new developed LIS focused on recording and updating the data. It is also generate a report in the system which will help the user to check the status of the equipment and component in laboratory. Besides that, this system developed a based forms oriented which used by the technicians and staffs before. It used databases concept to store all the information which related with land application processes. This system focused on recording and updating the data. Reports produced in the system make easier to check the status of the equipment and component. Besides, this system is a further development of conventional method using forms which used by the staffs before. It used database concept to store all the information, which related with application processes.

Survey is conducted for the proposed system named Laboratory Inventory System (LIS) that to be developed and used in FKEKK. The main focus is to help the laboratory technician to manage the information for each of equipment. Therefore, it will help technician to search, edit, update and delete information about equipment and component automatically with highly efficient. Laboratory Inventory System is one group database including complain form, equipment, login, laboratory and exertion [2]. Laboratory technician in FKEKK can choose any information that to be observed, edited, updated and deleted information about equipment and component in Laboratory Inventory System.

From the previous conventional system, all data are recorded in the system but the system looks not reliable since there are no protections against data losses. An individual file will be opened for each application. The problems that occurred in the conventional system is data loss and damage issue. By using file maker system, the probability for data loss and damage are very high. Some of the important data are vulnerable causing data violation. If this situation happens, it will bring some problems to obtain data. In some cases, the data stored in longer period time might even lose. Further, the difficulty to view list of files happened when the administration wanted to view all listing of files, the technician and staffs need to check all files at first step and then prepare the list. In conventional system, the use of listing is manually in written form. Certainly, it will take time and causing more time management interference. Difficult to check equipment and component status is another issue to be solved. For the manual inventory system, it takes time for tracking the status of equipment, the data listing sometimes not accurately been inserted. Usually when the administration wanted to check the equipment and component, the technicians and staffs needed to check their files first. Every movement and condition of equipment will be listed out. It is difficult to track down the improperly equipment status.

The proposed project target is to achieve a systematic and automated Laboratory Inventory System (LIS). This project will improve data security. The most important for data inventory is the safety. Using this invented LIS database, all data about equipment and component record will be kept in a database. By using this database concept, the problems such as data loss and damage can be avoided. The project will ease the user in checking equipment and component status. By using this system, technician and staffs can check the equipment and component status faster. The technicians and

staffs do not need to wait for a long time to check it in files like before. The searching and updating issue will be improved as the technicians and staffs can search and update the data systematically. This system already provided some functions such as searching, update, to help the technicians and staffs in controlling the data applications.

2. Methodology

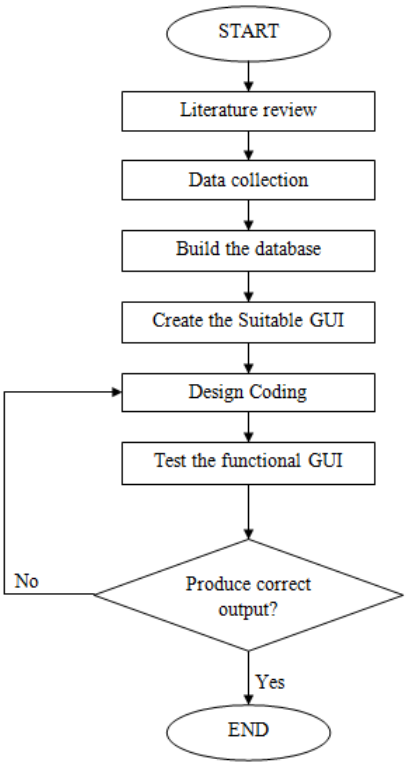

Figure 1: Flowchart of the methodology

The main methodology is divided into five parts. The parts are literature review, data collection; build the database, creating the suitable Graphical User Interface (GUI) complete with coding and software testing [3].

2.1. Literature review

The project begins with literature review where the overview of the project needs to be reviewed. The literature review is done by finding out numbers of laboratory are involved in FKEKK. All this information must be known in order to provide information inside the software that is useful in arranging the database [4].

2.2. Data collection

The data collection is done by obtaining how much equipment and component inside the selected laboratory as a sample for this data collection that is ECAAD laboratory.

2.3. Build the database

Database is required to improve the functionality of this project. Therefore, the first stage of software development is to create the database. Database is a body of information made up by related pieces of data organized so that they can be easily manipulated by computer. As for software development, it is important to have the database so that all the information need will be saved for future used.

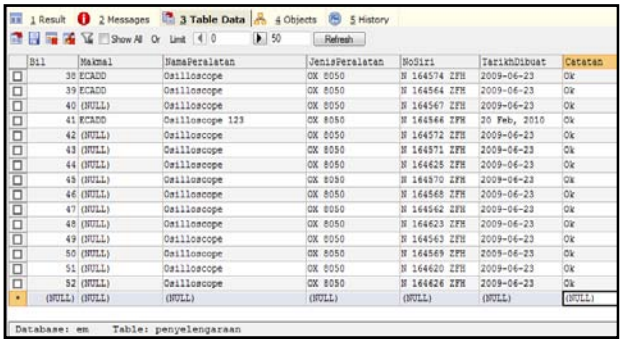

Figure 2: Interface of the database using SQLyog

2.4. Create the suitable GUI with coding

Graphical User Interface (GUI) is a way of interfacing with a computer using pictures and other visual elements displayed on a computer screen. The pictures and buttons are used to control many functions for example of a GUI [5]. GUI implementation is important to make user easier to understand what they have to do in order to use the software. The GUI must be user friendly and easy to understand. In order to make the GUI function, coding be inserted to make the software work properly. The GUI for this problem is design using Adobe Dreamweaver CS3.

Figure 3: GUI of the Main of Inventory Laboratory System

2.5. Software testing

Software testing is the process to measure the quality of developed computer software. The main intention is to determine whether the software meets its required results. It is used to finding, reduce and maybe can eliminate errors.

3. Results

3.1 Prototype Result

In software development, a prototype is a basic part of working model for a product or information system. It is usually built for demonstration purposes or as part of the developing process. Before creating the full software needed, a prototype is built in order to demonstrate what the software is basically about. GUI example of the prototype that is fully functioning as describes by figure below.

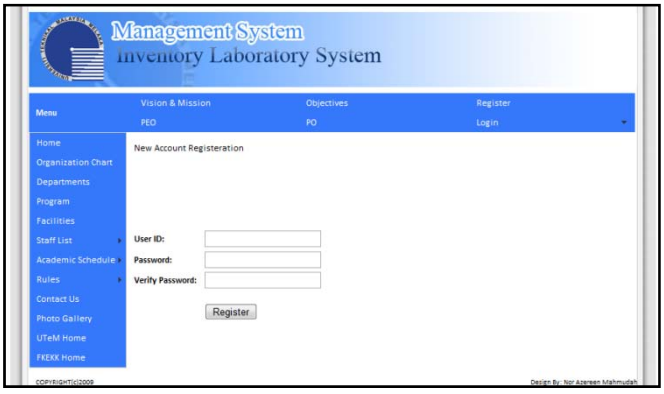

Figure 4: GUI of fully functional prototype

3.2 Prototype Testing

To test the prototype, user needs to insert the information of student. After that, click the REGISTER button and the software will automatically save the data into the database.

Figure 5: Interface of the Prototype After Data Has Been Inserted

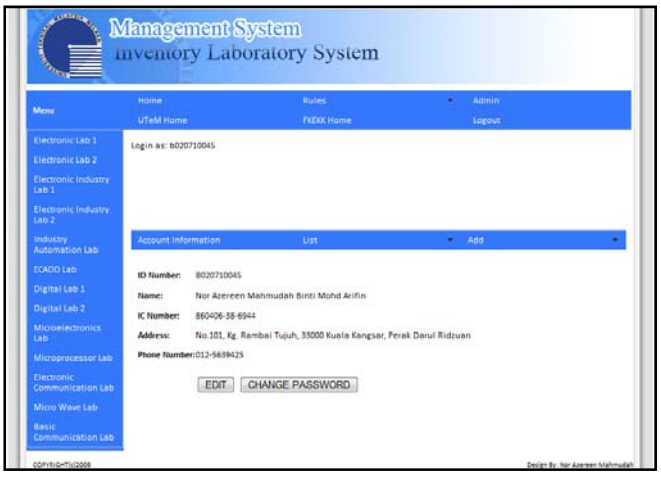

Figure 6: Interface of the Prototype After Data Has Been Inserted

3.3 System Testing

System testing is the process to measure the quality of computer software in term of correctness, completeness, security, technical requirement, capability, reliability, efficiency, portability, maintainability, compatibility and usability. Error is representing mistakes made by people and fault is result of error. Fault can be categorized as fault of commission and fault of omission. Fault is when entered something into representation that is incorrect. Fault of omission is when designer can make error of omission, the resulting fault is that something is missing that should have been present in the representation.

Failure is something that occurs when fault executes. Incident is behavior of fault. An incident is the symptoms associated with a failure that alerts user to the occurrence of a failure. Test case is associated with program behaviors. It carries set of input and list of expected output. Verification is process of determining whether output of one phase of development conforms to its previous phase. Validation is process of determining whether a fully developed system conforms to its SRS document. Verification is concerned with phase containment of errors and validation is concerned about the final product to be error free.

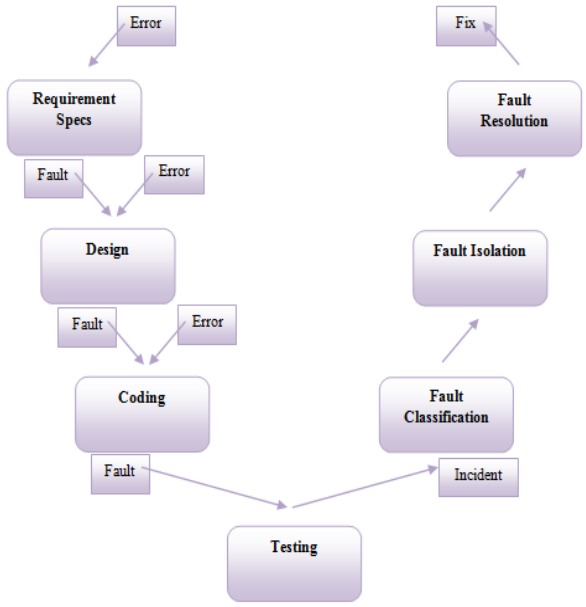

Figure 7: System Testing Diagram

3.4 Inputs and Outputs

System design includes input and output design. Keyboard and mouse are used as an important devices as input data. Data are inputs to this Laboratory Inventory System from system interfaces.

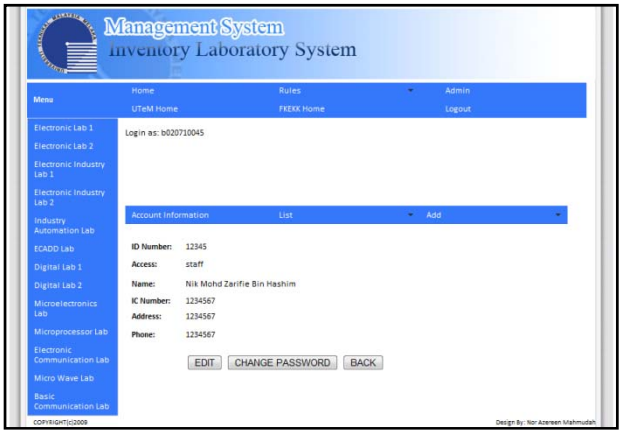

Figure 8: List of Laboratory Interface

Figure 9: List of Laboratory ECADD Interface

4. Conclusions

As for the conclusion, the main objective to develop the fully functional software that fulfills all the criteria needed is successfully done. The purpose of developing this software is to make an arrangement for the collective data regarding to the lab equipment are to be easily obtained and managed. The implementation of this project increased the quality time and saving man power. This system will give a better performance in storing the component and equipment information without having to do it manually. This system will help faculty's technician to arrange information faster and easier to allow them to focus on other important commitment. In the future, this software should be developed with an external source uploaded which can be uploaded the laboratory information from another source files. By adding the function to upload another source files, user can put the existing information from another file easy and faster without typing it again. All this while, information can only be getting from Microsoft Access file, by adding the function to upload sources from another file, user can get the information from Microsoft Word file and other files.

5. Acknowledgement

We are grateful to Universiti Teknikal Malaysia Melaka (UTeM) for their kind help for giving their laboratory facility as the place to do research and experimental works in order to complete this study. Thank you to all the supports given from our Centre of Telecommunication Research and Innovation (CeTRI) especially the knowledge and supplying the components which related to this project.

References

[1] Thomas & I.Mclean. (2007). MCITP self – paced training Kit (Exam 70 – 444): optimizing and maintaining a database administration solution using Microsoft SQL server 2005. Washington: Microsoft Corporation and Ian Mclean.

[2] W.V.Wezel, R. Jorna & A.Meystel. (2006). Planning In Intelligent Systems. New Jersey: John Wiley & Sonc, Inc.

[3] R.S.Pressman. (2005). Software Engineering. New York: McGraw Hill.

[4] J.M.Chambers. (1998). Programming with Data. USA: Lucent Technologies.

[5] N. M. Z. Hashim, N. A. Ali, A. S. Jaafar , N. R. Mohamad, L. Salahuddin, N. A. Ishak, "Smart Ordering System via Bluetooth", International Journal of Computer Trends and Technology (IJCTT) – volume 4 Issue 7, pp. 2253-2256, 2013.

Author Profile

N.M.Z Hashim received the B.Eng. and M.Eng. degree in Electrical and Electronics Engineering from University of Fukui, Japan in 2006 and 2008, respectively. From 2008, he worked as Lecturer in Faculty of Electronics and Computer Engineering, Universiti Teknikal Malaysia Melaka (UTeM), Malaysia. He is acting the Head of Department of Computer Engineering Department. His works are in Signal and Image Processing, Wavelet Transformation, Communication and Electronic Engineering. He joined Institute of Electrical and Electronic Engineers (IEEE), Board of Engineering Malaysia (BEM), Institute of Engineering Malaysia (IEM), Society of Photo-Optical Instrumentation Engineers (SPIE), International Association of Computer Science and Information Technology (IACSIT) and International Association of Engineers (IAENG) as member.

N. A. M. M. Arifin received the B. Eng degree in Electronic Engineering (Computer Engineering) from Universiti Teknikal Malaysia Melaka, Malaysia in 2010. Currently he is working with Yamaha Electronics Manufacturing (M) Sdn Bhd as Electronic Engineer.