

COMPUTER LABORATORY MANAGEMENT WITH MOBILE APPLICATION (CLMMA)

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Abstract- The purpose of the developed system entitled “Computer Laboratory Management System with Mobile Application” is to ease the managing and monitoring of Computer Laboratories and also to facilitate the laboratory on having their lecture classes in Our Lady of Fatima University, Philippines, specifically the Saint Benedict Hall Building. This study made a high impact on the non-faculty and faculty members under College of Computer Studies with the use of our System by evaluating our program using the ISO 9126 Model. The purpose of this study is to develop a LAN-Based remote control system that can monitor the activities of the terminals on every computer laboratory. Furthermore, to have a power control feature that can shutdown, log off, restart the terminals and to have a file transfer feature for the files and documents that automatically save on the computer. To have screen casting feature for lecture discussion through power points and other class purposes; and also to have an Android Mobile Application with power control feature with just one touch away on your smart phone. The developed system offers a high flexibility and functionality that will help the user to ease the managing of computer laboratory. The developed system was technically evaluated by the respondents including the I.T. Experts using ISO/IEC 9126 model. It has a set of software quality characteristics such as functionality, reliability, usability, efficiency, maintainability and portability with the overall score of 4.5 with the remarks of “Very Acceptable”. The developed system will be elevating through additional features, recommended to provide more functions that will improve the system and continuously help the beneficiaries.

Index Terms- Computer, Laboratory, Mobile

I. INTRODUCTION

Technology is the fast growing industry in this generation nevertheless it has no signs of slowing down anytime soon. Furthermore, everything will be run by technology in the near future. Technology is everywhere, lately with computers, smart phones and televisions. There is an enormous changed within this particular field over the years; since the days of the printing press and the first cellular phones, technology raise and boost in the said industry. Computers and cellular phones are used every day all over the world, in many different ways. Computers and cell phones help with businesses and work from home opportunities. Social networking and games are also a big part of everyday life of people all over the world within the technology aspect.

People in public areas especially in schools have a Computer Laboratory. A computer laboratory is a place which provides computer services to the public and usually free.

On the other hand, there is a need of protection and restrictions within networks available to the public. Users especially students might be denied access to websites featuring adult content or sites that demand too much bandwidth. Users that use computer laboratory are usually allowed to consume a limited amount of time to be signed onto a machine, whether surfing the internet or using software to do other work. Seldom, there is a charge to use a public computer laboratory but laboratories in educational facilities tend to be available only to current students of the school and usually must sign on so that their activities

can be traced and monitored if necessary. Computer laboratories can be found in libraries, schools, government buildings, science laboratories community centers companies with IT departments that requires such a place for their employees to do their jobs and research centers. Printers, scanners and other peripherals may augment the laboratory setup.

An internet café differs from a computer laboratory in the usage of a computer lab is generally free for those with access, while internet cafés charge for computer use. The term ‘internet café’ is often used interchangeably with ‘computer lab’ but may differ from a computer laboratory in that users can also connect to the internet using their own computer or device and users of a computer laboratory generally do not need any equipment of their own

II. OBJECTIVE OF THE STUDY

This study is to design and develop a Local Area Network (LAN) Based Computer Laboratory Management System with Mobile App for Saint Benedict Hall Building, to ease the managing and controlling laboratories simultaneously.

Specific Objectives

- To develop power control system that will manage computer units on each laboratory.
- To develop a remote control to monitor every activity on every computer unit.
- To have an Event Logs for monitoring and security purpose;

- To have a Client Server having a chat and SOS button feature;
- To develop a file transfer feature for distributing files and other documents;
- To have a Screen Casting Feature for lecturing purposes.

Android Mobile App:

- To develop a power control to manage the computer units with one touch.

III. SIGNIFICANCE OF THE STUDY

Significance defines the benefits of the study in a certain area. The developed study is significant to the following areas

Our Lady of Fatima University (OLFU). The study is seen significant to the University, due to the fact that they would have a competitive advantage among other universities.

OLFU IT Department. The study is seen significant to the Department because they would have a competitive advantage among other departments.

OLFU IT Staff. the study is seen significant to the I.T. Staff because the system will be beneficial to I.T. Staff for it will help them to manage the computer laboratories.

IV. SCOPE OF THE STUDY

The developed system LAN-Based Computer Laboratory Management System with Mobile App is intended only for I.T. Department of OLFU Valenzuela SBH Bldg. The system has a power control that can shutdown, restart and log off the terminal. It also has remote control for monitoring the activities of the terminal. The system can communicate from client to server and vice versa using a chat box/SOS button. The system also includes screen casting feature for overseeing client computers. A mobile application has been created that can also control the LAN Based-system. The system is running for 10-15 networked computers.

V. RELATED SYSTEM

A. Strategies for Managing School Computer Labs and Classroom Computers

Computer lab management software can have several meanings: it can refer to software like Foolproof or Fortres which "locks down" the computer and only grants users access to limited software features. In the context of this article, however, "computer lab management software" refers to programs used by a teacher in the course of a lesson to maintain student attention and enhance instructional delivery. Screen sharing is a typical feature of lab management software, allowing the teacher's computer screen or

another student's screen to be shared with every other computer in the lab. Effective use of computer lab management software can make a tremendous, positive difference when teachers use a computer lab for instruction. A copy of this article is available on www.wtvi.com/teks, including links to the software options discussed below as well as others. Use of computer lab management software is included in the online curriculum for the workshop "Strategies for Managing School Computer Labs and Classroom Computers" on www.wtvi.com/teks/labstrategies/.

Design of management system for Computer laboratory based on ITIL; currently, problems which the computer laboratories in higher learning institution are confronted with are as follows: lacking consciousness for service and standardized management, lacking means for executing and maintaining, no standardized process, no record for software and hardware configuration and change as well, and also changing configuration randomly. All these lie in that management concept of these laboratories stay in elementary mode of old mechanism, with the executing mechanism lacking the consciousness of service and practice. This article introduces the core of ITSM system implementation: ITIL-based laboratory management framework, process modeling and design for configuration data structure. The system combines with the current management situation in higher learning institution and makes some progress in the executing and maintaining management in computer center.

Managing Computer Lab Sessions, Keeping It Focussed; for many subjects it is useful to use Web-browsers for students to research information, but the difficulty is that students often get distracted from the original purpose or worse still they sneakily use extra browser windows to hide their personal email and games. This paper plans to outline a framework to efficiently manage computer lab sessions and will include the following aspects: Designing tasks in appropriate stages to ensure clarity, setting boundaries and expectations before the task, clearly communicating the task in class, monitoring the task effectively, giving appropriate feedback and measuring outcomes from the time spent on the PCs. This paper's ultimate aim is to provide a system that increases student productivity and provides a clear skeleton for teacher planning.

B. ACER Classroom Manager (ACM)

Acer Classroom Manager (ACM) is a feature-rich software solution developed with the different needs of teachers, students and technical staff in mind. ACM simplifies multimedia teaching and learning by integrating classroom PC management and monitoring via an easy-to-use interface. This allows teachers to focus on teaching and not on managing various devices.

With ACM, teachers can easily supervise and interact with their students individually, in groups, or with the

entire class. They can save time by launching applications or websites simultaneously on all classroom PCs beforehand, keep a record of attendance, monitor student activities and progress, and test students for comprehension and understanding.

VI. CONCEPTUAL FRAMEWORK

This section presents the research design in pursuing the proposed study and includes how the development of the project will be done in accordance to the systematic procedure and processes. This also includes the evaluation procedure, evaluation criteria and instruments and techniques used.

The conceptual framework is a group of concepts that are broadly defined and systematically organized to provide a focus, a rationale, and a tool for the integration and interpretation of information. Usually expressed abstractly through word models, a conceptual framework is the conceptual basis for many theories, such as communication theory and general systems theory. Conceptual frameworks also provide a foundation and organization for the educational plan in schools or university which have given additional information.

Conceptual frameworks, according to educational researcher Smyth (2004), are structured from a set of broad ideas and theories that help a researcher to properly identify the problem they are looking at, frame their questions and find suitable literature. Most academic research uses a conceptual framework at the outset because it helps the researcher to clarify his research question and aims.

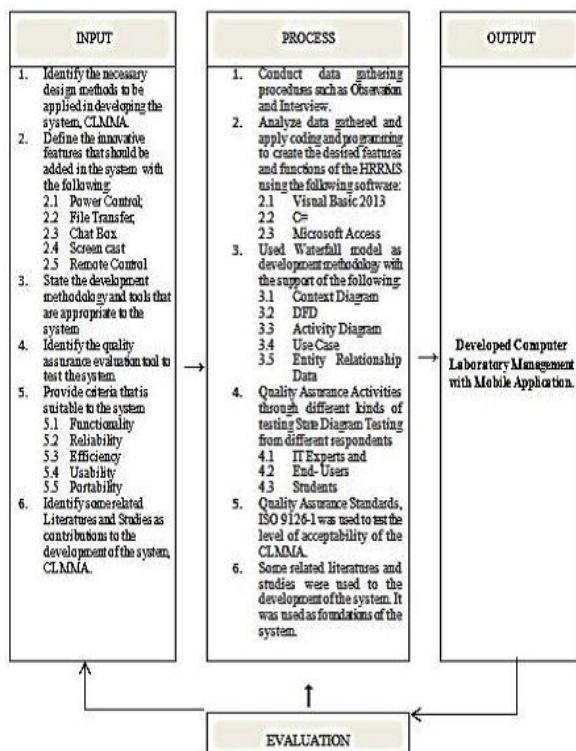


Figure 1: Conceptual Framework of the developed system
VII. METHODOLOGY

Waterfall model is a sequential design process, used in software development processes, in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of Requirements and Analysis, Design, Development, Testing, Production/Implementation and Maintenance.

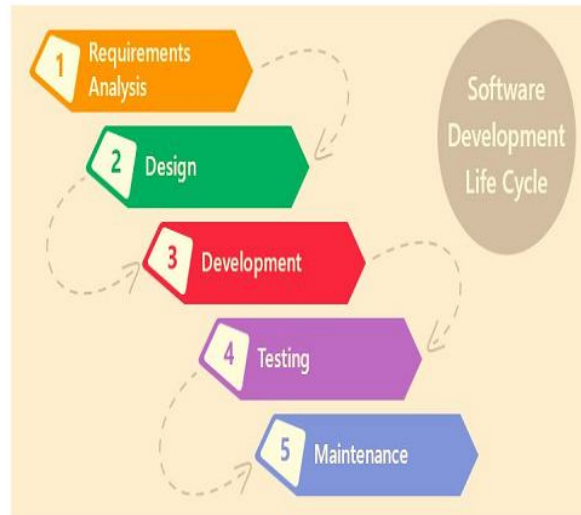


Figure 2. Waterfall Model of the developed system

The waterfall model is an ineffective process for developing software according to Abhinab Choudhury on his article: <https://www.sdlic.ws/waterfall-model/>.

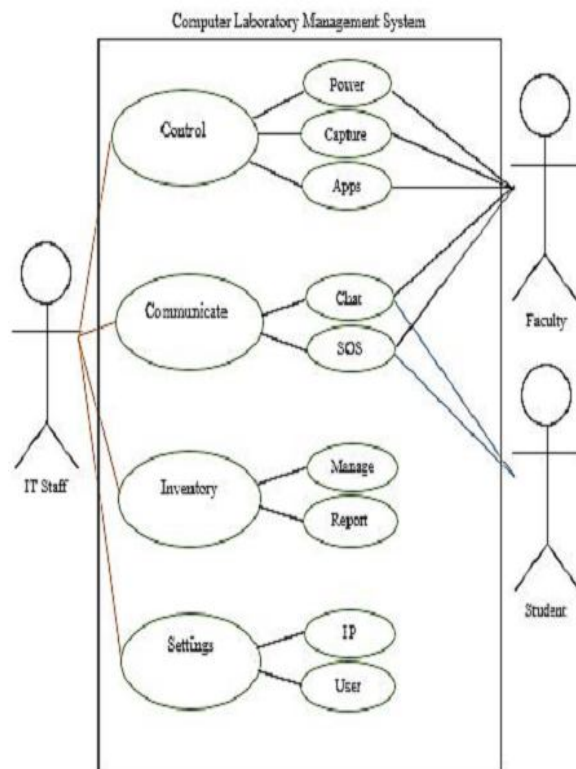


Figure 3. Use Case Diagram of the developed system

Fig 3 shows the list of action or event steps, typically defining the interactions between the actor and the system. It shows the interaction of the users on the system.

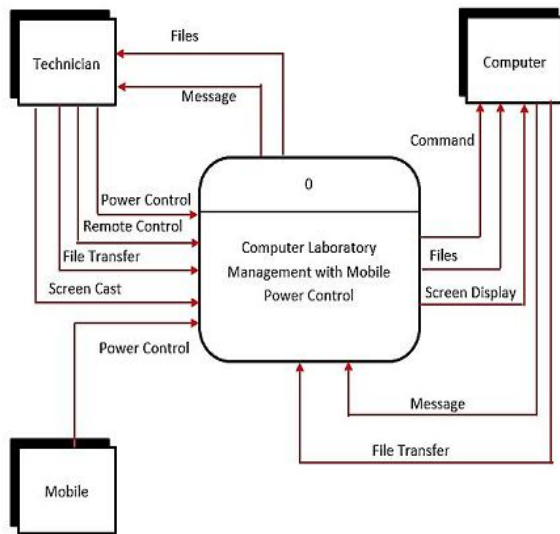


Figure 4. Context Diagram Level 0 of the developed system

The fig 4 defines the boundary between the system, or part of a system, and its environment, showing the entities that interact with it.

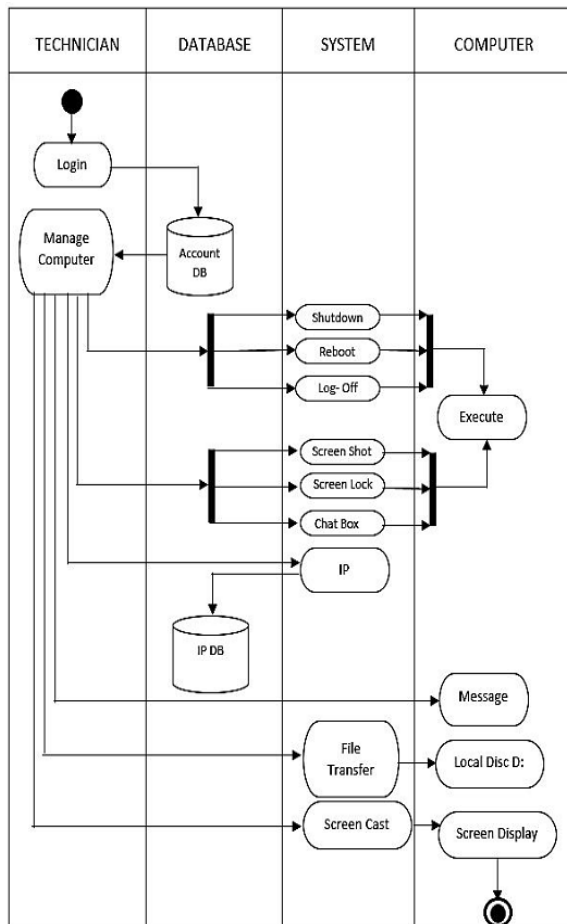


Figure 5. Activity Diagram of the developed system

Fig 5 shows the representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency.

VIII. EVALUATION CRITERIA

The ISO 9126 model is an international standard in evaluating certain software. It represents the research into characterizing software for the purpose of software quality control, software quality assurance and software process improvement. This model has 6 main quality characteristics namely:

- **Functionality** - performed to verify that a software application performs and functions correctly according to design specifications. It verify that an application is still fully functional after localization.
- **Reliability** - about exercising an application so that failures are discovered and removed before the system is deployed. The purposed of reliability testing is to determine product reliability, and to determine whether the software meets the user's reliability requirements.
- **Usability** - technique used in user-centered interaction design to evaluate a product by testing it on users.
- **Efficiency** - tests the amount of code and testing resources required by a program to perform a particular function.
- **Maintainability** - basically defines that how easy is to maintain the system. This means that how easy it is to analyze, change and test the application.
- **Portability** - process of testing the ease with which a computer software component or application can be moved from one environment to another.

IX. RESULTS AND DISCUSSIONS

This section is all about the discussion of the results of the evaluated CLMMA software. In able to determine the capabilities of the software, this chapter will show the tabular reviews to interpret and analyze the data that the proponents gathered.

The tabular reviews will show the strength and weaknesses of the software that will determine the probable cause of a problem that will serve on how the proponents will improve the software.

The table below shows the number or frequency of the respondents.

Table No.1 Number of Respondents

Position	Frequency	Percentage
IT Expert	5	15%
Student	20	57%
End-Users	10	28%

Table No. 1 shows the position and numbers of the respondents. It shows that 15% with a total of 5

persons are IT experts, 57% with a total of 20 persons are students, and 28% with a total of 10 persons are End-Users of the Software.

X. PROJECT EVALUATION

Project Evaluation provides the results of the acceptance of the developed system.

1. Design – the software is designed for school computer laboratories technically Microsoft Windows based computer.
2. Programming - The programming language that is used to develop this software is Visual Basic 2013 and C# for the development of the mobile application.
3. Testing - The software was tested to ensure the beneficiary that it is free from any kinds of bugs or errors to avoid any problems while using the software.
4. Implementation of the Developed Application - The proponents implemented the proposed software on Windows 7, 8 and 10 to computers and Android JellyBean to ensure the software is flawlessly functioning on the computer. The software needs a LAN and WAN for the connections of the terminal.
5. Technical Feasibility – In developing the CLMMA software the proponents needs to deal with the system requirement to determine the reliability and competitiveness of the software and identify the sudden cause of a problem depending on the complexity of the software. The system is said to be technically feasible before conducting the development.
6. Operational Feasibility – CLMMA is assessing the current work practices and procedure to support the beneficiary on how will affect the working lives of the faculty and non-faculty on using this software

XII. PRESENTATION OF DATA

Table No. 2 Overall Criteria of CLMMA

Criteria	Mean	Description
Functionality	4.5	Very Acceptable
Reliability	4.2	Very Acceptable
Usability	4.5	Very Acceptable
Efficiency	4.6	Highly Acceptable
Maintainability	4.6	Highly Acceptable
Portability	4.5	Very Acceptable

Table 2 shows the results of the evaluated software by the respondents including the I.T. Experts using ISO/IEC 9126 model. It has a set of software quality characteristics such as functionality, reliability,

usability, efficiency, maintainability and portability with the overall score of 4.5 with the remarks of “Very Acceptable”.

XIII. PROJECT EVALUATION

The system was tested and evaluated based on the criteria functionality, reliability, usability, efficiency, maintainability, and portability to decide the IT Experts acceptance. The researchers did a demonstration of the system in order for the respondents to know the functions of the system and how to manipulate it. The system was tested and evaluated in Nestle Business Services located at Meycauayan, Bulacan, in Action Center located at Dalandanan, Valenzuela City. Questionnaires were distributed to four (4) respondents from NBS, one (1) respondent from Officer in Charge - Flood Control, two (2) respondents from Accenture, and one (1) respondent from ClariTrade. The acceptability of the software was determined after computing the evaluation of the result of IT expert’s evaluation.

SUMMARY, CONCLUSION AND RECOMMENDATION

SUMMARY

The proponents developed a LAN- Based System and Android Application entitled Computer Laboratory Management System with Mobile Application by using Microsoft Visual Studio 2013 and C# with Microsoft Access for database. The purpose of this study is to manage and monitor the computer laboratory to maintain its quality.

The proponents used a waterfall model for the system development approach with the phases of requirements analysis, design, development, testing and maintenance. The proponents also used a lot of diagrams to be able to understand the flow of the software and to guide the users on how they will use the modules.

After several testing of the software to determine if it’s flawlessly functioning, the proponents conducted an evaluation procedure to know the strength and weaknesses of the system using ISO/IEC 9126 Model and Likert Scale. The following respondents are the I.T. Experts, the End-Users and the students. CLMMA software got a mean score of 4.5, having a remark of “Very Acceptable” which means it is successful.

CONCLUSION

After following the sequential process on developing this project entitled Computer Laboratory Management with Mobile Power Control (CLMMA) , the proponents conclude that Our Lady of Fatima University must have a computer laboratory manager that will help the professors and I.T. Technicians to maintain the quality of the terminal in each laboratory, not only for the maintenance but also for the

innovation of our education in our university. As the technology develops, students must innovates their learning process and increase their knowledge. Furthermore, the proponents developed the CLMMA with the following Features:

- The system has a power control system that will manage computer units on each laboratory;
- It has a remote control to monitor every activity on every computer unit;
- It has Event Logs for monitoring and security purpose;
- It has a Client Server having a chat and SOS button feature;
- It has a file transfer feature for distributing files and other documents;
- It also has a Screen Casting Feature for lecturing purposes.

Android Mobile App:

- It has a power control feature to manage the computer units with one touch.

RECOMMENDATION

Everything has its own limitation that needs an improvement; CLLMA also needs an expansion of ideas to improve more the functionalities of the software. The researchers of this study aims to help the future researchers to enhance more the CLMMA system. The following are the suggestions and

recommendations for the enhancement of the developed system.

- To have a certain limit for file transferring;
- To have a list or logs for file transfer;
- To have an access control for admin;
- To develop a lock screen remote;
- To have a warning message for students

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