Implementation of an Asset Management and Maintenance System for the College of Information and Communications Technology

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ABSTRACT: The Implementation of an Asset Management and Maintenance System intended for the College of Information and Communications Technology – Bulacan State University. The researcher proposed the system because of the fast – growing number of resources of the College. The system provides the management and monitoring of assets such as computer peripherals, furniture's and appliances except for consumable materials and assets in the library such as books, theses and magazines because it is not included the scope of the system. The system offers three types of users to secure data in the system. The administrator type will be handled by the dean and assistant dean of the College. The administrator type has the privilege to view all the encoded data in the system. The technician type will be handled by the room technicians and technician of the College. They have the authority to view reports such as Monthly Report (Technician's Report) and changed the asset status. And lastly, the custodian/instructor type will be handled by the custodians and instructors of the College. The custodians and instructors are allowed to view the assets listed to their names or accounts and the assets in the room they are assigned. The encoding of information in the system is done with a separate account called secretary account. In the secretary account, the authorized person will encode all the data into the system. The secretary account also has the authority to update and delete any data in the system, since the encoding of information is done with this account.

KEYWORDS: monitoring, secure data, administrator, reports, encode.

1 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Asset Management describes the management of technical infrastructure for business operation it also helps in delivering additional reports to support management decisions. IT asset management involves the management of IT infrastructure like computer, monitor, keyboard and even software installers. IT asset management helps in tracking and configuring all IT devices within one information system, it also includes the detailed analysis of all the assets of the organization [1]

The objective of asset management is to maximize the use of an asset. In managing the asset properly, it does not only maximize the life or the use of an asset but it also improves the production costs and quality that the assets can provide. Managing the assets includes the regular maintenance of the asset and keeping it in working condition. It also involves replacing it when it becomes obsolete or too costly to operate and maintain.

Nowadays, organizations rely on IT for their operations, protecting and managing IT assets. IT asset management involves the managing of the existing equipment and other physical assets. It also protects high value data and coping with the fast changing technology

As to the researcher clientele, the College of Information and Communications Technology, has a current technology which consists of computer units for laboratory, lecture and office purposes. The clientele has a total of 22 Computer

Laboratories with an average of 30 computer units per room, six Academic Rooms and eight Logic and Hardware Rooms . As of August 2011 and also as a requisite for level three accreditation, the College of Information and Communications Technology has already purchased 120 new computer units and new LCD projectors.

The researcher have considered the managing and the maintaining of assets of the College of Information and Communications Technology which are the major concerns in the growing number of properties of the college. As of today, the clientele uses the manual method of managing assets, where the room technician and room custodian check the room assigned to them; this is done twice a month or every fifteen days. After the room technician and room custodian finished checking all the assets inside the room, they list down all the status of every asset, and then they transfer it on Microsoft Excel for the final report. Then, the room custodian and the room technician submit their report to their respective department head. In the report, prior to the room the custodian and technician handles, there must be a indication if an asset is moved to another room or what is the status of that asset because the property custodian of that asset must be informed about the condition of the property named and handled by them. After the report is given to the department head, the department head will now check if the report has been done correctly. Finally, the reports using Microsoft Excel are submitted to the dean of the college and if there are assets to be condemned in the report, the technicians must prove that the asset is not functioning at all. The distribution of the newly procured assets is also in a manual method which is a time and effort consuming. If the employees of the college are on-leave or attending seminars, they cannot commit to their job in maintaining, monitoring and managing the assets of their room assignment and they will fail to provide proper and accurate information in their report. Also, the dean, the department head and the property custodians should monitor the all the assets of the college based on the reports given by the room custodian and room technician.

The common tools in manual method for asset are the Microsoft Excel and Microsoft Word. The users can sometimes mistype and miscalculated some data that leads to a severe problem when an audit exercise has been launched or sometimes leads to inaccurate and incomplete report.

In response to the aforementioned issues, the researcher have come up with an idea of proposing an IT Asset Management System called CICT Asset Inventory and Management System.

CICT Asset Inventory and Management System is an Online Asset Management System intended for the use of the College of Information and Communications Technology. It will help the college in managing, monitoring, and maintaining all the assets such as computers, computer peripherals, software, appliances and furniture's. It also features an announcement page where the administrator can notify all the employees about the current information pertaining to the assets of the college even if they are not physically in school. CICT Asset Inventory and Management System can generate report based on the duration of the date selected by the user. The system is a web based Asset Management System, which can help all the employees in monitoring and checking any updates and information about the assets of the college even they are not physically present in the school or in their workplace. The inventory of assets, their location, condition assessment, and other relevant information can be shared in real time and updated continually.

1.2   THEORETICAL AND CONCEPTUAL FRAMEWORK

Asset Management and Maintenance System is about tracking and managing all assets during their life duration period. Assets management and maintenance system can be classified into two types, the hardware and software. Even the two classifications are very different from each other, they are often joined because the hardware contains the software and the software determines requirement of the hardware. The software and hardware are both significant to each other in one way or another. Inventory must be efficient and practical. The entire process should be unified to the client's processes and should require limited user interaction. The database should automatically update data based on the latest changes done by the users without requiring manual intervention or interaction in the system.

As of today, there are still organizations, company, colleges and institutions that are using the manual method of maintaining, protecting and tracking their assets. However, the manual method of asset management may fall short. Records of assets and store were not kept properly and the office-in-charge cannot perform physical inspection from time to time. The procurement method of assets is not always based on the requirement as well as the disposal was not carried out according to the procedure, it is also troublesome, time and effort consuming in tracking the physical assets. The common tools in manual process of maintaining assets are the Microsoft Word and Microsoft Excel that can be sometimes mistyped, incomplete and miscalculated, resulting to a serious problem when an audit exercise has been launched where the records are inaccurate.[3]

There are organizations that rely on IT for their operations and managing their assets. IT asset management includes the detailed analysis of all the assets of the organization [1]. Protecting assets is essential in every organization since a lot of

money is involved in obtaining new assets. One of the objectives of asset management is to maximize return on assets. In managing the assets properly does not only maximize the lifespan or the use of an asset but it also improves the quality the assets can provide. [4]

PHP or HyperText Preprocessor is a programming language that is used mostly for building interactive websites. It was originally called "Personal Home Page Tools" and it was created in 1994 by Rasmus Lerdof. It was installed on more than 15 million websites like the giant Yahoo!.

PHP program usually runs on a web server and is accessed by many people using web browser on their own computers. PHP interpreter is written in C programming language. PHP uses the <?php as the start tag and ?> as the end tag. PHP interpreter ignores anything outside the start and end tag. However, text before the start tag and after the end tag is printed. PHP interpreter on a web server follows the instructions in a PHP program to output a webpage. PHP is a server-side language, meaning it runs on a webserver, while the languages and technologies such as JavaScript and Flash, they are called client-side because they run on a web client like a desktop pc.[5] HyperText Preprocessor is a cross-platform. It can run on different operating system such as Windows, Mac OS X, Linux, Solaris and UNIX. PHP works with many different web servers in many different ways, but the most popular way of running PHP is as an Apache Module.[6]

Asynchronous JavaScript and XML or commonly known as AJAX is one of the new technologies that are changing the World Wide Web. In using AJAX, typical page flow changes compare in a normal web application. An AJAX web application adds a new type of request, for a web server it looks just like a normal page request but to the web browser it is a request that won't require a page reload on completion and doesn't have to be directly initiated by the user. XML or Extensible Markup Language is a standard for text document markup. XML is not a programming language but it is a set of rules for creating other markup language.

Nowadays, World Wide Web is a dynamic environment, users set high bars for both style and functionality of a website. Developers used jQuery in building interactive, interesting sites, since jQuery can simplify complicated tasks. The library is designed for novice programmer and most of its concepts are copied from the structure of HTML or Hypertext Markup Language and CSS or Cascading Style Sheet.[7] In using raw JavaScript dozens of lines are created for each task, the creator of jQuery created the library to make tasks easy.

MySQL and PHP work together, they are dynamic partners. In fact they are called the dynamic duo, MySQL provides the database part and PHP provides the application part of the system. The Application is a web-based or web application if the end user intermingles with the application using a web browser. And if the web application requires a long-term storage of information using a database, therefore it is a web database application. A web database application consists of a database, which is the long-term storage of the application, and an application, which is a group of programs that perform the tasks.[7]

The Database is the heart of a web database application. It stores information for the application in an organize manner so the information can be easily found when it is needed. Databases are useless unless there is a movement of data, in and out [8].

In this study, the researcher used diagram that recapitulated the steps on developing the system as presented in figure 1 as a conceptual model. A system can be modeled using IPO model. The IPO model describes how a process can transform and input to give a desired output. [7]
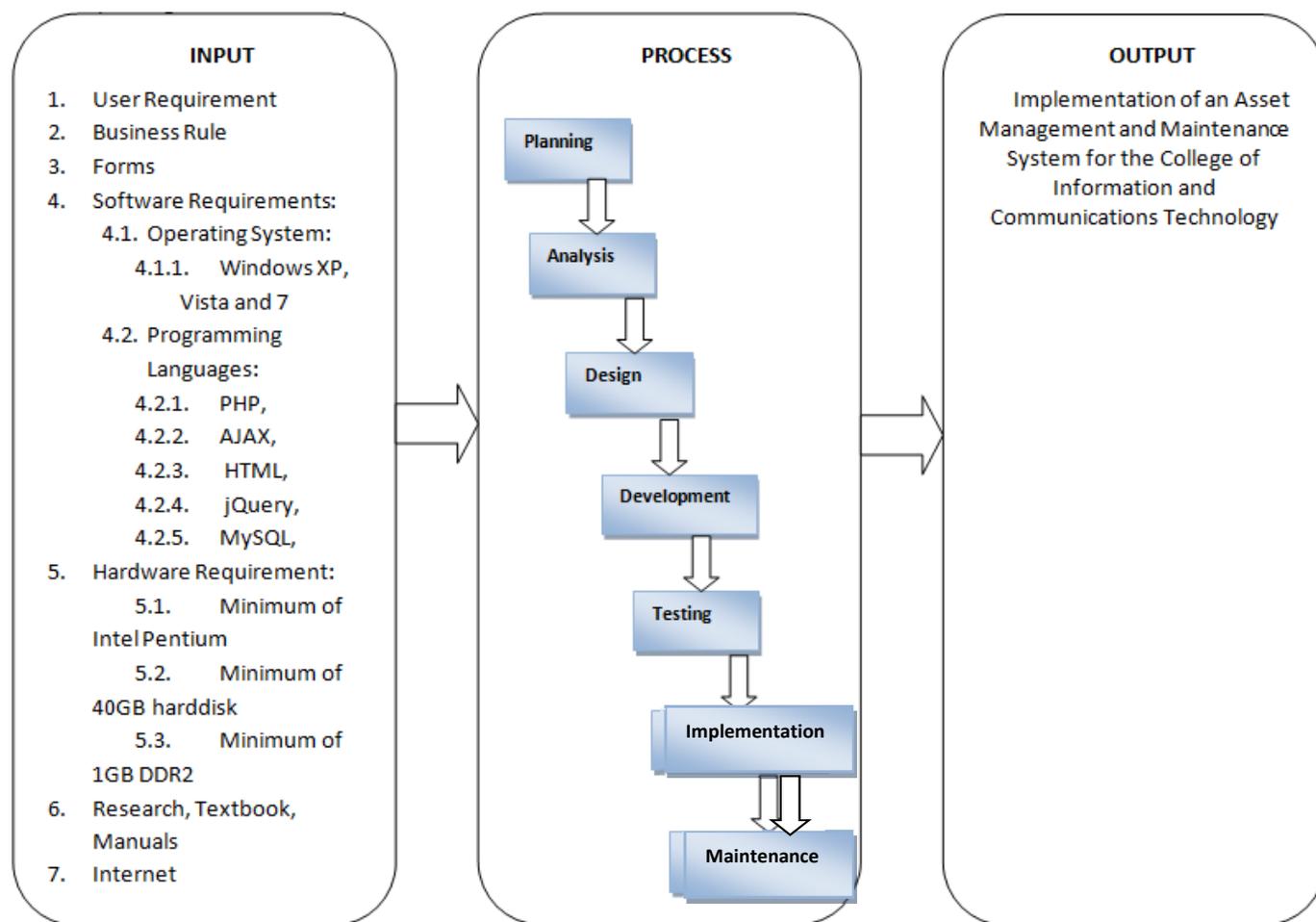
INPUT

1. User Requirement
2. Business Rule
3. Forms
4. Software Requirements:
   4.1. Operating System:
       4.1.1. Windows XP, Vista and 7
   4.2. Programming Languages:
       4.2.1. PHP,
       4.2.2. AJAX,
       4.2.3. HTML,
       4.2.4. jQuery,
       4.2.5. MySQL,
5. Hardware Requirement:
   5.1. Minimum of Intel Pentium
   5.2. Minimum of 40GB harddisk
   5.3. Minimum of 1GB DDR2
6. Research, Textbook, Manuals
7. Internet

PROCESS

Planning → Analysis → Design → Development → Testing → Implementation → Maintenance

OUTPUT

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Fig. 1.   Conceptual Model of the Study

The first part of the diagram is the input which refers to all raw materials required in the development and producing output, basically the most common input from the user as user's requirement, research done by the researcher, forms for the data required to validate and the business rules that will define the system process.

The second part is the processing side, which involves different stages. The first stage includes planning and analysis which discusses the analysis of the input and converting into technical aspect resulting of programming and development. During this activity the proponent discovers ambiguities and inconsistencies in the transaction management particulary in the asset management and maintenance of the College of Information and Communications Technology. The result of the analysis is a system model annotated with attributes, operations, and associations. The design phase of the study will follow after the analysis, and in this includes precisely describing object and subsystem interfaces, selecting off-the-shelf components, restructing the object model for performance. Interface of the system is properly layout as what has planned during the analysis stage. Development stage includes the programming side such as the development of the front-end application and back-end application of the Asset Management and Maintenance System for the College of Information and Communications Technology. For better quality of the output testing is being applied also under the processing. In this stage, the differences between the system and its model are find by executing the system with the sample input data. During the implementation stage the developed Asset Management and Maintenance System for the College of Information and Communications Technology becomes operational. This include user training and software installation. The maintenance part will accommodate all necessary enhancement to the system as well as correction of any errors encountered.

Upon completing all the stages under the process the final output will be fully functional Asset Management and Maintenance System for the College of Information and Communications Technology.

2   OBJECTIVES OF THE STUDY

2.1   GENERAL OBJECTIVES

To develop an Asset Management and Maintenance System designed for the needs of the College of Information and Communications Technology.

2.2   SPECIFIC OBJECTIVES

2.2.1.1   To develop an asset management and maintenance system, that is capable of not just monitoring the assets it is also capable of receiving new assets by saving information about the asset;

2.2.1.2   To develop a system that is Web based for an easier way of managing, monitoring, and maintaining all the assets of CICT;

2.2.1.3   And to integrate the following:

2.2.1.3.1   easy update the status of the asset by using the asset status reporting module;

2.2.1.3.2   user can update the information of an asset including its location;

2.2.1.3.3   adding new room on the system is easy and quick;

2.2.1.3.4   user can easily add new department on the system and adding new category, description, brand and asset type is possible by using the Asset Maintenance module;

2.2.1.4   The system can generate accurate and reliable PDF report according to the filter selected by the user

3   STATEMENT OF THE PROBLEM

The general problem of the study is: How may the asset management and maintenance system for the College of Information and Communications Technology be improved?

Specifically, this study sought answers to the following questions:

1. What are the important features of the Inventory and Asset Management System for the College of Information and Communications Technology?
2. What application development model shall be used for the Inventory and Asset Management System for the College of Information and Communications Technology?
3. What operational requirements are needed by the system in terms of hardware and software requirements?
4. How functional is the Asset Management and Maintenance System for the College of Information and Communications Technology in terms of the following software evaluation criteria: user – friendliness, security, usability, reliability; and functionality?

4   METHODOLOGY

This section also discussed the methods used by the proponent in gathering data and information need in this study. As the proponent developed the system, research plays a vital role thru investigation regarding the existing system must be done in order to formulate an effective plan for the development of the system to meet the needs of specific objectives of the developed system.

A reflective thinking is a situation of an aesthetic value, a process in which creative resources are used to produce valuable objects for the development of the system. It must consider the specific problem to identify the hypothetical solution. A research method employs basically the implicit and the stylistics approach of value. It operates toward production of object and aesthetic value thru the process of reflective thinking.

The proponent used different methods in order to formulate a detailed design for the presentation of the developed system. Therefore this study developed a system that is user-friendly, informative and can effectively use in maintaining office records.

Developmental research attempts to answer the question: How can researcher build a 'thing' to address the problem? It is especially applicable when there is not an adequate solution to even test for efficacy in addressing the problem and presupposes that researcher don't even know how to go about building a solution that can be tested. Developmental research generally entails three major elements:

- Establishing and validating criteria the product must meet
- Following a formalized, accepted process for developing the product
- Subjecting the product to a formalized, accepted process to determine if it satisfies the criteria.

Developmental research is distinguished from product development by: a focus on complex, innovative solutions that have few, if any, accepted design and development principles; a comprehensive grounding in the literature and theory; empirical testing of product's practicality and effectiveness; as well as thorough documentation, analysis, and reflection on processes and outcomes

Since the study is developmental in nature, it attempted to determine the acceptability of the developed Asset Management and Maintenance System for the College of Information and Communications Technology. And so, the proponent used this method to gather data which is necessary for creating the developed system.

5   CONCLUSION

1. The Inventory and Asset Management System for the College of Information and Communications Technology has the following important features managing, monitoring, and maintaining all the assets of CICT. These features greatly increase the functionality of the said system
2. The developed system make used of the Waterfall Model as an effective development model.
3. The Inventory and Asset Management System for the CICT used PHP , AJAX, jQuery, HTML for the front end application while about MySQL is used for its back-end application.
4. The Inventory and Asset Management System for the College of Information and Communications Technology is functional in terms of reliability, efficiency, accuracy, user friendliness and security.

RECOMMENDATIONS

Based on the abovementioned conclusion, the following recommendations are presented:

1. That deployment of Inventory and Asset Management System for the College of Information and Communications Technology as full running system in the College be carefully considered;
2. That the enhancement of the application to make is web – based be periodically observed; and
3. That inclusion of the possible improvements is the automatic reporting of defected computer hardware, meaning the computer itself will report to the system about the damage without the help or intervention of the faculty members.

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