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Equipment Inventory Management and Transaction Recording Using Bar Coding Scheme via VB6

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ABSTRACT: The aim of the study is to implement bar coding system developed through the VB6 and Microsoft Access as mechanism for the PUP ECE Laboratory Transaction recording and monitoring. The study was concerned on proper documenting and managing the daily transaction of the ECE Laboratory with the AutoLab System.Results showed that the AutoLab System effectively automated the recording of transactions merging the existing manual method into one recording mechanism. The Automated Laboratory coined as AutoLab merged the ECE Room Utilization Log Book, ECE Borrower's Slip and the ECE Transaction Log Book into one complete package in terms of transaction recording and equipment inventory monitoring.
Keywords: Equipment Inventory Management, Bar Coding, VB6

I.   INTRODUCTION

Engineering is considered as one of the vital fields for economic and technological modernization in every country. Engineering tackles not only on modernization of buildings, bridges and contructions but through the Information Communication Technology.

Modernization in ICT encompasses the development of methodologies to pave way for ease in every transaction that is made in a given office.

With modernization tracks, management therefore would be aligned to paperless and faster transactions.

This study had been developed to contribute towards development in equipment management and transaction recordings.

Conceptual Framework

Figure 1 presents the research paradigm for the study. The paradigm incorporated observation of the existing Laboratory Transaction Recording and Equipment Inventory Monitoring. After a thorough observation and analysis, a new system to improve transaction recording would be designed and recommended; as such, AutoLab would be suggested. Auto Lab is a coined term meaning Automated Laboratory.

The generation of AutoLab was through the Visual Basic System and Microsoft Access to attain a well-developed AutoLab system. Visual Basic was used for program processes while the Microsoft Access was used for the different databases designed for the system.
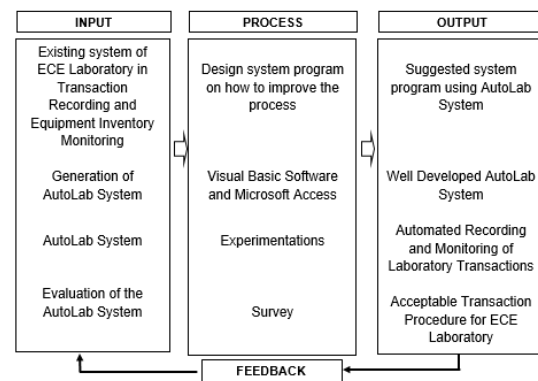

Figure 1 Research Paradigm

The AutoLab system had undergone several experiments to test the effectivity of the system. Evaluation through survey was done to assess the acceptability of the system to the ECE community.

Statement of the Problem

The study focused on the development of AutoLab system through the VB6 and the bar coding scheme inventory monitoring report.

Scope and Limitation

The study was concerned on proper documenting and managing the daily transaction of the ECE Laboratory. Records for faculty and student users will be limited to the ECE department while class and room schedules will be based on the current semester for SY 2014-2015. It does not cover students from the allied engineering programs.

The generation of bar codes for each equipment and key was done through a bar code

generator and in accordance with the PUP Equipment Inventory Property Number. The Bar code reader is a laser type reader that reads the 1D Code 128 formats while the system is implemented through the Visual Basic program.

Student Identification Card with bar codes was utilized while the faculty bar code was generated in Code 128 format.

Records allocated for equipment inventory monitoring will only cover the equipments duly located at the Office of the ECE Laboratory Head (ECE Room 304A). The system provides a record of equipment and assumes that the equipment is physically present within the premise of ECE Room 304A.

II. METHODOLOGY

The method of research used was a Quasi-Experimental method as it utilized both experimental and descriptive method. Experimental because the system will be subjected to series of experiments to test its accuracy, efficiency, effectiveness and reliability.

The researcher used experimentations to test the proposed system automation through the actual test implementations. Two main experiments have been conducted - the test for accuracy of the system in transaction recording and the equipment inventory monitoring. Test for accuracy was divided into four parts namely (1) Borrowing of Key; (2) Borrowing of Equipments; (3) Returning of Keys; and, (4) Returning of Equipments. On the other hand, the equipment inventory monitoring incorporates the analysis of the equipment utilization in terms of what equipments were usually borrowed, in what subjects a certain equipment was being used and the history of usage for a given equipment.

III. RESULTS

AutoLab is a coined term for Automated Laboratory. The system aimed to develop the transactions recordings and inventory reports under the ECE Laboratory automated utilizing the existing PUP Student Identification Card to supplement information regarding a student borrower.

Figure 2 illustrates the process on how the system would work all throughout. The Bar Code in a PUP student identification card is scanned and read through a bar code reader. It sends the scanned code for verification wherein it would automatically presents the student number, student name, year and section. With automatic time updating, the time that the room key bar code is scanned, automatically logs the time borrowed and returned to the transactions recording.
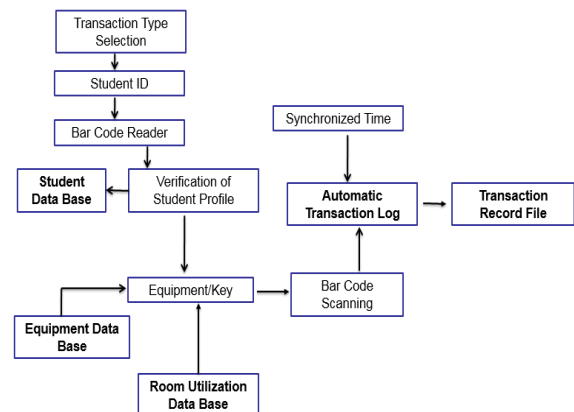

Figure 2 AutoLab System Transaction Flow

The borrowing of equipment undergoes the same process. The equipment bar code would be scanned and automatically register the equipment borrowed under the name of the borrower. The time of release would be log to the system.

Bar Code for equipments was generated and coded in relation to the PUP Property Number in a Code 128 Format.

As the Identification Card of the student is scanned, the system retrieves the information of the user and displays such information to the Graphical User Interface.

When a key bar code is scanned, the system filters and presents the room utilization schedule. The system is synchronized with the time embedded in the computer unit used - signifying that when transaction is being saved, it automatically log in the time of a key being borrowed and automatically log out when returned.

During the equipment transaction, when an equipment is being borrowed and scanned, the subject box in the GUI must be filled out through the generated subject bar codes. This is to monitor the subject where the equipment would be utilized. When the save button is clicked, the information is automatically sent to the system for entry log of the time borrowed or returned.

In the experimentation made in returning keys and equipments, record was seen to be complete and accurate in terms of time log during the returning process. The record was seen to be complete and automatically log the time the key or an equipment had been returned as shown in Figures 3 and 4.

Figure 3 Sample Transaction Recording for the Key Transaction Using the AutoLab System

Figure 4 Sample Transaction Recording for the Equipment Transaction Using the AutoLab System

The AutoLab is equipped with four (4) significant databases needed for the system to work out.

The first one is the class list which presents the record of ECE students from first years to fifth year's section one to five.

The second database is the Class Schedule where each section of each year level can be checked with regards to each whereabouts during the current semester.

The third database is the Room Schedules; which present the utilization of each ECE room from Mondays through Saturdays, 7:30 am to 9:00 pm.

The last database incorporated the equipments under the ECE Laboratory which include the property number and the status of the equipment.

Figure 4 shows the Log In Graphical User Interface allocated for the Admin (the Laboratory Head) and the Student Assistants. This is implemented so that only the permitted personnel of the ECE Laboratory would operate the system.

Figure 4 Log in Graphical User Interface of the Bar Coding System

Figure 5 shows the Log in Graphical User Interface allocated for the Admin (the Laboratory Head) and the Student Assistants. This is implemented so that only the permitted personnel of the ECE Laboratory would operate the system.
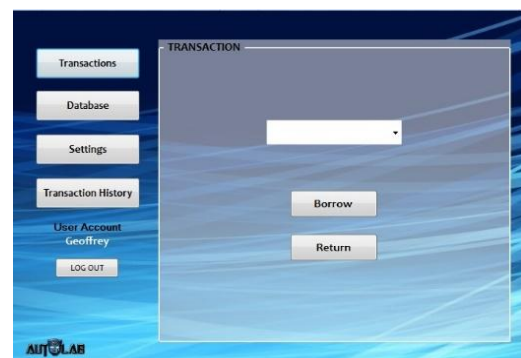

Figure 5 Graphical User Interface of the AutoLab identifying the transaction being held

Figure 6 Graphical User Interface for Equipment Transactions

IV.   CONCLUSIONS

From the given results, this study concludes that:
1. AutoLab system as a mechanism for automation in transaction recording and equipment inventory monitoring showed effectivityfor the PUP ECE Laboratory Office;
2. AutoLab system shows high potential and effective method for transaction recording and equipment inventory monitoring as it has seen to be a 100% efficient and could provide a convenient way of analysis for equipment utilization and room transactions as well; and,

V.   RECOMMENDATIONS

For further improvement of the study, the following are hereby recommended:
1. Enhancement of the Graphical User Interface; such as adding a profile picture of the borrower for security purposes in terms of room keys and equipments;
2. Access code for faculty members may be integrated in order to record the permission of the faculty, for the student users to use equipment or room key; and,
3. Further studies regarding the total efficiency of the new system may be conducted.

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Author's Note

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