

CAMS: CVCITC ATTENDANCE MONITORING SYSTEM

Mark Christian D. Antonio¹, Lea P. Alicaway², and Erwin N. Lardizabal^{3,*}

¹²³College of Information Technology and Engineering, Cagayan Valley Computer and Information Technology College, Inc., Santiago City, Philippines

Abstract

Manual checking of attendance may not be as effective as automated checking of attendance. The manual attendance marking is not always effective as one needs to spend extra time for arranging records and calculating the average attendance of every student. Manual checking of attendance may be time consuming, inconsistent and prone to errors. Inasmuch as people aren't perfect, with manual checking of attendance, there's a possibility that they accidentally switch details and end up with inconsistency in data entry or in hand written orders. RFID based Attendance recorder with SMS alert System is an application that was developed by the researchers to overcome the above stated problem that can provide a computerized attendance checking of SHS students in CVCITC. The objective is to implement a time wise, convenient and innovative way of attendance checking. This study made use of the developmental research design since it proposed an Attendance Monitoring System using RFID Reader with Short Messaging Service. The CAMS: CVCITC Attendance Monitoring System was studied and analyzed to provide a convenient, reliable and time-wised attendance monitoring for the Senior High School students. The system was created using the method and procedures of Rapid Application Development.

Keywords: *RFID Reader, Short Messaging System, Attendance*

1. Introduction

Absenteeism is one of the common problems in the academic field. Absenteeism is a truant behavior that negatively affects the performance of students. Moreover, absenteeism can lead to depression that may lead to poor quality of education as a result of time lost while being away from school and could also lead to moral degradation that leads to drug abuse, early pregnancies and unruly behavior (Keter, 2013). Attending school regularly is a vital factor in school success for both students and teachers. Excessive school absenteeism is often linked to poor school academic achievement (Walters, 2009). There are many factors that affect student achievement directly and indirectly at the secondary educational level. Lower attendance rates have been cited as detrimental to academic achievement; therefore, it is suggested that improved attendance is a direct indicator, rather than determinant of students' academic achievement (Murat, 2015). In a study that investigated the links between absenteeism and various characteristics of classes, it was found that smaller classes had less absenteeism; the more significant the mathematical component of the course is, the less absenteeism was incurred. Furthermore, there was more absenteeism in introductory courses than in upper-level courses; the better quality of the instruction, the less absenteeism; and



above all, absenteeism was mainly concentrated in a few students who missed many classes while most students rarely missed classes. The attendance rate is important because students are more likely to succeed in academics when they attend school consistently (Teasly, 2007). It is difficult for the teacher and the class to build their skills and progress if a large number of students are frequently absent. In addition to falling behind in academics, students who are not in school on a regular basis are more likely to get into trouble with the law and cause problems in their communities (Bruner, 2011).

Manual checking of attendance may be time consuming, inconsistent and prone to errors with the problem being that people are not perfect. With manual checking of attendance, there is a possibility that the person doing it accidentally switches details and end up with inconsistency in data entry or in hand written orders. This has the effect of not only causing problems with Administration but also disabling information for reporting or finding trends with data discovery. Reporting and checking of data may be hard and inconsistent. This is often an area where significant time and effort can be saved by automation. It takes more effort and physical space to keep track of paper documents, to find information and to keep details secure. When mistakes are made or changes or corrections are needed, often a manual attendance must be completely redone rather than just updated. With manual or partially automated systems, information often has to be written down and copied or entered more than once. Automation can reduce the amount of duplication of data entry (Arulogu, 2013).

Therefore, this study entitled “The CAMS: CVCITC Attendance Monitoring System” aims to help not only to provide a computerized attendance system but also keeping the parents informed about their child’s attendance via SMS. The CAMS: CVCITC Attendance Monitoring System is used to capture the attendance of the child. This is done using the RFID cards. RFID has become very popular these days. It uses a smart system that can identify, monitor, secure and do the object inventory by using radio frequency. This technology is also used in the Library Management System, Bank Locker Security System etc. This technique is safe, secure, faster and easy to use with lower overheads in contrast with other conventional techniques such as barcode, biometrics etc. It has two components: RFID tag and RFID reader.

1.1. Objectives of the Study

This study is designed to develop the CAMS: CVCITC Attendance Monitoring System (CAMS) which is intended for Cagayan Valley Computer and Information Technology College in Santiago City.

Specifically, this study aims to:

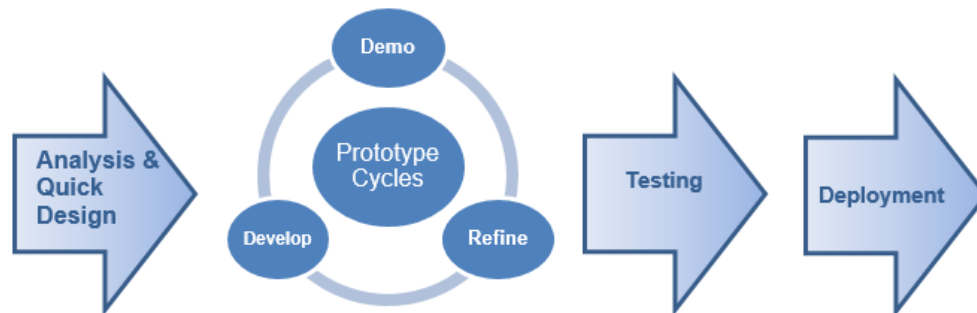
1. Determine the information requirements of the proposed system.
2. Determine the functional and non-functional features of the proposed system.
3. Design the proposed system.
4. Evaluate the technical performance of the proposed system.

2. Materials and Methods

This study made use of the developmental research design since it proposed an



Attendance Monitoring System using RFID Reader with Short Messaging Service. The CAMS: CVCITC Attendance Monitoring System is analyzed to provide a good quality service for the students. The system was created using the method and procedures of Rapid Application Development. This is shown in the Flow Chart given in the figure below.



Analysis and Quick Design. The researchers gathered needed data to fulfill needed requirements for the system, the researchers decided on the quick design of the system.

Prototype Cycle. The Prototype Cycle has three components: the **Develop** Phase, in this phase the researcher develops the system; second phase is the **Demo** (Demonstrate) Phase, where the researchers demonstrate the developed system; and lastly, the **Refine** Phase, where the researcher define and decide for the refinements and improvements of the system for better performance.

Testing. The developed system is now ready to be tested in its environment. And the final and last phase is the **Deployment** which is not part of this study.

Respondents. The primary respondents are the Enrolled Senior High School Students of Cagayan Valley Computer and Information Technology College, Inc., at Santiago City.

Instruments. This study doesn't require a questionnaire but the researchers conducted an interview with students and professors about the CAMS: CVCITC Attendance Monitoring System.

Data Analysis. The following are the Data Analysis tools used by the researchers in preparing and solving the problem encountered in the study.

a. Data Flow Diagram

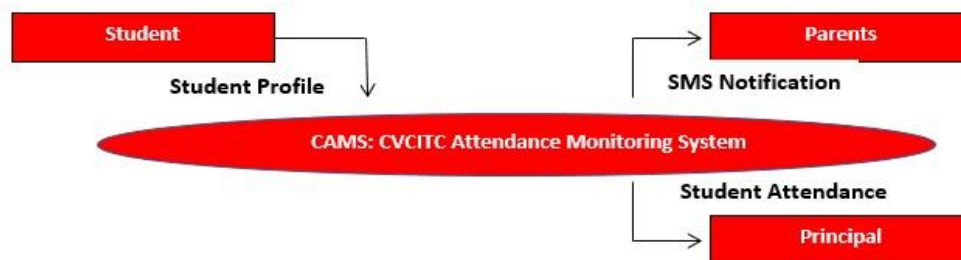


Figure 3 shows the data flow diagram of the system. It shows the graphical representation on the flow of the data every time the student will Log in and Log out and the system will process the log details. Once the process was completed, the system will send an SMS



notification to the parents about their child's arrival. The system will also provide student logs for the principal.

b. Entity Relationship Diagram

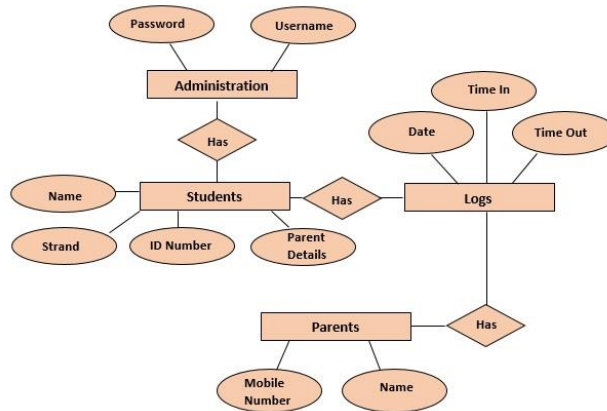


Figure 4 shows the Entity Relationship Diagram of the system. It demonstrates the relationship among entities. Before the student uses the system, the administration must enable the system and needs to log-in which requires a username and a password. After Logging in, the students are now allowed to use the system. The Log process contains Date, Time in and Time Out. After the system finish the Log process, it will automatically send a text message to the parents. The parent Entity has two components which is Mobile Number and Parent Name.

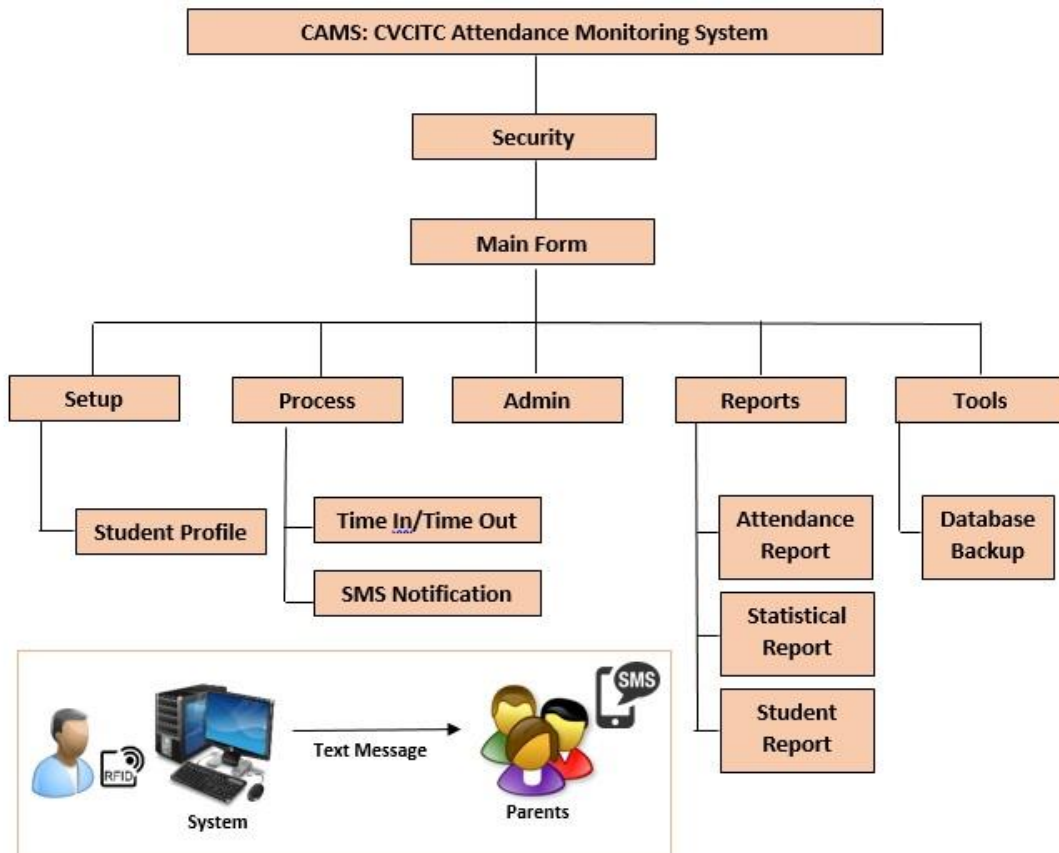
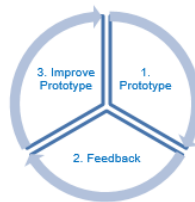


Figure 5 illustrates the Hierarchical Input Process Output of the system and shows how the system works and the components of each of the Processes. It shows the overall design of the system being implemented and its specific requirements. Setup module contains one sub module, the student profile. Process module contains two sub modules: The Time in/Time out and SMS Notification to the parents. Report module contains one sub module, the Attendance Report. Finally, the Tools module with one sub module, the Database Backup.



Figure 7: Prototype-Feedback-Improved Prototype



Data Gathering involves acquiring data that are needed in designing and crafting of the system. Gathering of data can be done by meetings with the Administration, Students and Parents. It also uses internet for conceptualization of the system and overview.

Prototype Development. This involves crafting a prototype system that is intended for presenting the design and how the system works; this was presented to the administration of the school to identify and collect additional requirements needed for the improvement of the system. In addition, the construction of the system includes the creation of databases, application programs, user and system interface.

System Implementation. Before the implementation stage, the following were completed:

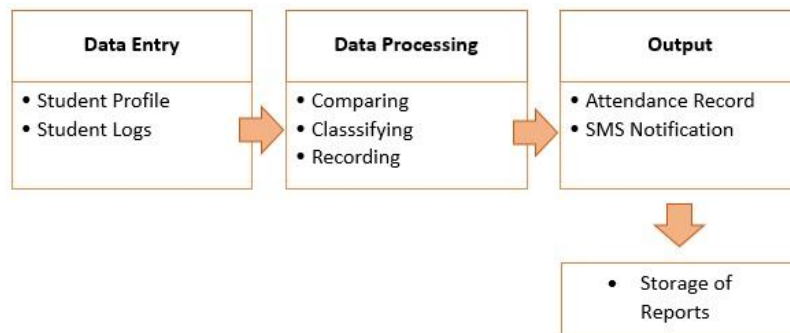
1. System Testing, to make sure that the system is working properly.
2. Device Testing, to make sure that the device works properly.
3. Installed the Application needed for the system.
4. Provides a User manual and installation manual for the users/clients.

The **Personnel-in-charge** and the authorized personnel to operate the system is the computer laboratory officer who is responsible in maintaining the system including the annual system reviews in order to make sure that the system is working properly and also conducting a regular data back-up.

Evaluation. The clients or respondents evaluated the system for improvements and adjustments. We used the standard evaluation form by ISO 9126 since this is a developmental research. ISO 9126 is an international standard for the evaluation of software quality which identifies 6 main quality characteristics, namely: Functionality, Reliability, Usability, Efficiency, Maintainability and Portability.



Present System Workflow. First is the **Data Entry** where the students log in/log out in the system to record the attendance with their name, strand, grade and time of arrival. Second is the **Data Process** wherein the system classifies whether the ID number is matched with the system. Last is the **Output** where the Log details will display on the screen and the information will be stored in the database; the system will also send an SMS notification to the parents. Figure 8 shows the Present System Workflow.



Technical Work flow of the System. The technical work flow describes how the student uses the system. The student will tap his/her ID into the reader and the details will be processed by the system. After confirming, the log details of the student will be directly saved in the database and the system will send a SMS notification to the parents with child's name and time of



3. Results and Discussion

1. Requirements of the Proposed System

1.1 Functional Requirements

- User must be computer literate and can do basic computer operations.
- User must be knowledgeable in basic troubleshooting.
- User must be knowledgeable in basic database systems.
- Administrator can Add, Edit and Delete student profile.
- Administrator can deactivate a user account.

1.2 Non-Functional Requirements

- Easy to use and friendly user system.
- High cost but can be useful.
- Need electricity to operate.

1.3 Hardware and Software Requirements

Software	Requirement
Operating System	Microsoft Windows 8 or Higher
Apache Server	XAMPP
Database Server	MySQL
Microsoft Visual Studio Ultimate	Version 11.0.50727.1 RTMREL
Hardware	Requirement
DESKTOP	
Processor	Intel core i3 or higher recommended
Motherboard	GIGABYTE GA-H110-DS2 1151, DDR3, HDMI
Memory RAM	4GB DDR3 PC10600/1333 or Higher
Hard Disk Drive (HDD)	SP550 120GB SSD
Keyboard/Mouse	USB mouse/ PS2 keyboard
LCD Monitor	AOC/HKC 18.5 LCD Monitor
Automatic Voltage Regulator (AVR)	500VA AVR
RFID Reader	USB 2.0

1.4 Manpower

User. A user must be a computer literate and should have the ability to do basic computer troubleshooting when an error occurs during the process.

1.5 Cost Analysis

Cost				
Category	Item	Quantity	Price	Total
Equipment	Laptop Computer	1	P 14,500	P 14,500
	RFID Reader	1	P 3,000	P 3,000
	Broadband Dangle	1	P 999	P 999
Total Cost				P 18,499

2. Features of the Proposed System

2.1 Login Form (Administrator)

The administrator can operate and access the system through the login form. This is a security feature of the system where the only authorized personnel can use and access the system. The administrator can add, edit and delete student profile and can limit the access of ordinary users.



2.2 Automated Attendance Monitoring

The Automated Attendance Monitoring System provides a computerized attendance for the students so that the time consumed in checking of attendance is lessened. The system is also geared with RFID Reader for efficiency and accurate attendance checking. In addition to its feature, it also has an SMS notification for the benefit of the parents.



3. Development of the Proposed System

3.1 Pre- Development. This is the stage where the researcher gathers information needed to develop the system through questionnaires and interviews. This stage may help the researchers to craft the system and also to identify the relevant features that the system must possess. This planning phase must be completed before proceeding to the development phase.

3.2 Development. This phase is the proper start of development of the system where the developers start creating the design, modules and database of the system. The researchers start to write codes for the system to work.

3.3 Post – Development. This stage of system development is where the researchers guaranteed that the software and hardware components of the system are properly working and compatible in its working environment. In addition, this phase determined the revisions and recommendations before the implementation of the system in actual environment.



3.4 Acceptability of the Proposed System

Recognizing the need of effective and time wised attendance monitoring for the senior high school students of CVCITC, the importance of notifying the parents about their child's attendance is the reason for the development of the system. The study was conducted to evaluate the level of acceptance of the developed system in terms of its functionality, efficiency, reliability, usability, maintainability and portability.

4. Conclusion

Based on the evaluation made by the respondents on the developed system, the researchers arrived at the following conclusions: 1) The system helps not only the school but also the Parents in monitoring the students' attendance; 2) The system lessens the time for attendance checking; 3) The system becomes a good relief for the parents because they can monitor their child's attendance even at home or at work without any worries; 4) The system lessens the paper work; everything is automated so the manual intervention has been removed; 5) The system is more efficient, reliable and user friendly to its users.

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