Chapter 1

INTRODUCTION

The technology has grown so fast. It changes the way of people in doing their daily task. It made their daily lives easier. Giving a way for technology gives us knowledge in improving or innovate how to collect information in a creative way. Through technology people can store and keep different information privately and safely. Recently, the technology became the medium in all aspects in education. Students used technology in attending classes and the teachers also used technology in checking the attendance of the students who attended in their classes. The attendance is part of the grading system. It can also be the most important thing for the students to succeed in their academic performance. The School attendance is a baseline factor in determining student success (Great Schools Staff, 2016). Currently, the process of checking attendance of every student during school event is done manually. The assigned Supreme Student Council (SSC) of each class requires students to sign their names on a piece of paper as a proof of their attendance in a particular activity prior to start the program/activity.

Having this kind of work done all over again seems to be tedious and time consuming. With these methods, errors, redundancy and discrepancies are inevitable. The queues of students in the registration area cause the delay and reliability of monitoring the attendance.

During the face to face classes, the Supreme Student Council has a hard time in monitoring the attendance of the students. Further, taking student attendance manually and storing records for a long time is a difficult task and wastes a lot of time and resources. In terms of consolidation of the report of the attendance of the students, incomplete and inaccurate information may possibly happen. Additionally, it would increase the risk of direct contact among participants of any event, which may lead fast dissemination of the corona virus disease that the world is still facing right now.

Taking all these into consideration, the researchers has develop Web-based School Event Attendance System Using Biometric check the students attendance

using their fingerprint in any event and store the collected data in the database. This computer-based system has the capability to do the checking of the attendance of the students through a fingerprint scanner. The system will then be responsible in keeping the records of students present during the school event. This process of monitoring will also be paperless to lessen the time spent and hassle of the officer in charge.

Project Context

The Web-Based School Event Attendance System Using Biometric will be using fingerprint scanner to get the attendance of the students in every school event as they Time-in and Time-out, which will be stored and recorded in the database. Through this system student can easily time in and time out with ease since the system can operate by itself. Every records or data that has been store can be downloaded by the in-charge anytime with complete detail of the event and the attendees.

Purpose and Description

This study focuses on reducing effort on paper work and save time required to generate reports from the student's attendance. The system will upgrade the manual process of checking attendance in every event happened in school/university into computerizes system using the biometric where students can time-in and time-out using the system which will be recorded and stored by the system on the database. The data recorded will include the students' personal details.

Objectives

The purpose of this system is to design and develop a Web-Based School Event Attendance System Using Biometric that will help the school to make the attendance more efficient and accurate. To prove that the system developed is effective and helpful, the researchers has to do the following:

1. To develop a module wherein the student can time-in and time-out using biometric.

2. To verify students' identity/ information using fingerprint.

3. To provide consolidated records of attendance that can be use for school accreditation and signing of clearance.

Scope and Limitations

Web-Based School Event Attendance System Using Biometric will improve the way of checking attendance during school activities. The system will facilitate a faster and easier checking attendance of every student. It will also save time and reduce amount of work. Once the student places their registered biometric, the information of the students will automatically appear in the monitor which will be saved in the database. The attendance on the events will be stored in the system wherein the officers, teachers or any trusted staffs have an access on data. The time range of the event depends upon the time that the event will start.

The system will register student fingerprints, record attendance and generate reports by activity. The study will only include the attendance the students for every event or activity conducted by the school. It is not capable of monitoring the students around the school campus. The system also not capable of identifying students who are absent during the event.

The system is exclusive for JHCSC Dumingag Campus and the attendance will only cover those students who are registered to the system and who time-in using biometric.

Significance of the Study

This system aims to replace traditional manual attendance recording system by an advance system with facilitating easy analysis, minimizing time consumption and cost incurred. This study will be beneficial to the following:

Student. The students can easily sign their attendance through biometric in every school event.

Instructor. Utilizing the system, instructors can easily check and download event/activity attendance.

Department of Student Affair (DSA). The DSA can determine who are late and absent during the school event/activity.

Supreme Student Council (SSC). The SSC officers can generate a complete list of students who attended in the school event that can be use in validation of attendance during signing of clearances.

Definition of Terms

For clarification and common understanding, the keywords used in the study were defined as follows:

PHP - A scripting language to be used in the study.

Attendance - the act or state of going regularly to or being present at a place or event. Operationally, attendance refers to the number of students that are present.

Database - is a collection of information that is coordinated so that it can easily be accessed, managed, and updated. In one view, databases can be classified according to types of content.

Technology - is the collection of skills, techniques, methods, and processes used in the production of goods or services or in the fulfillment of objectives.

Visual Basic – language used in developing the system.

Administrator – SSC officers and DSA, the in-charge of the system.

Biometrics- a device that enables to scan a fingerprint for attendance of students.

Fingerprint- persons' fingertip used for identifying individuals from the unique pattern of whorls and lines.

Chapter 2

REVIEW OF RELATED LITERATURE AND SYSTEMS

This chapter presents the theoretical and technical background of the study, hardware and software specifications, programming environment, related studies both local and foreign and the synthesis that provides insights and ideas for better understanding of the proposed system.

Theoretical Background

Biometric authentication is considered as an automatic identification, or identifies verification of an individual using either a biological feature they possess (physiological characteristic like a fingerprint) or something they do (behavioral characteristics, such as a signature). For authentication purposes, an individual must first be enrolled in a biometric system and the system must verify the claimed identify by comparison with a reference template.

Roa et al (2003) proposed Employees, Students and Guests using Fingerprint Recognition are needed to scan their fingerprint every check in and out to record attendance. Minutebased matching combined with alignment-based greedy matching was used to recognize scanned fingerprint in the proposed checked in and out. Although the authors reported that the proposed system is easy to use and of low cost, the proposed system is not appropriate for course attendance system since if there are a large number of classes in the same time then the system requires a large number of fingerprint recording devices. Moreover, if there are a large number of students in a course, then the system will cause a long and time-consuming queue.

Technical Background

This project used a biometric concept to facilitate the entering in School. It used the most reliable way of uniquely identifying students through fingerprint reading. Such type of application is advantageous in school as well as in JHCSC Dumingag campus for daily entering school. This project would enable the natural way of checking Log-in with fewer efforts. School Event Attendance Monitoring System using Biometric operate straightforwardly and user-friendly. The main advantage of this project was

that it would change the procedure with a simple check-in and check outs, by just scanning the biometric since, registering the Log-in manually could usually cut down the study time in the class, but with the biometric, it would save a lot of time.

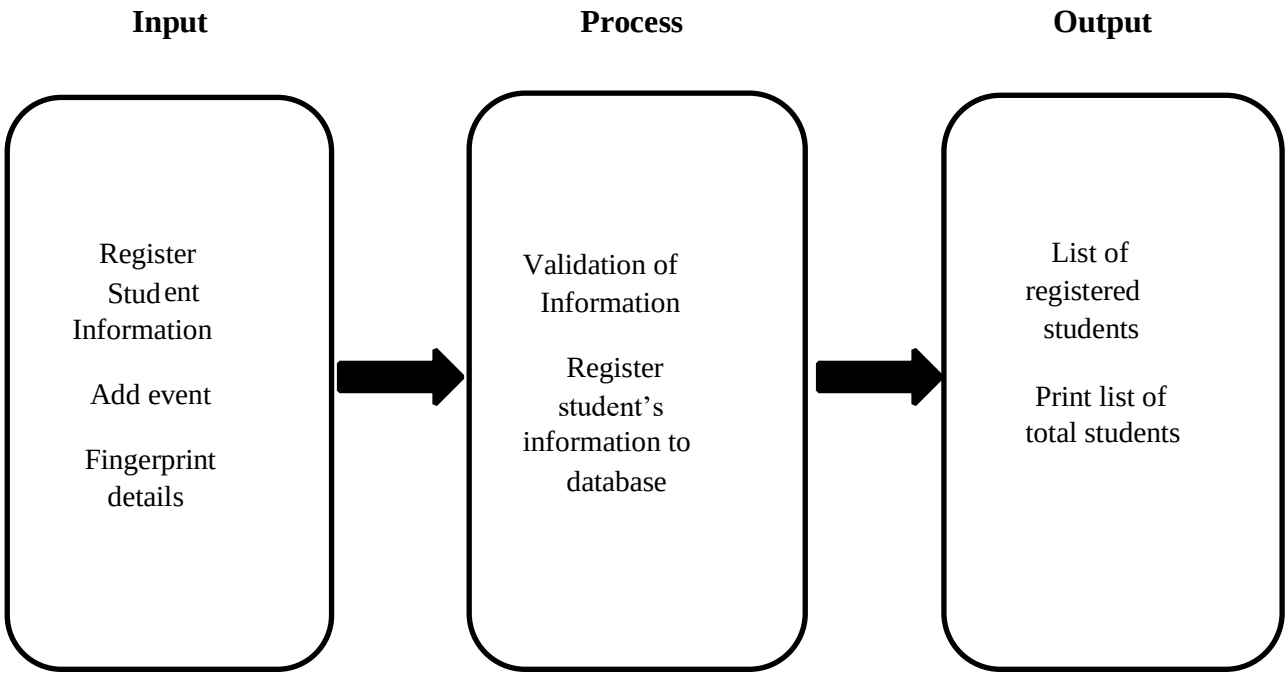

Figure 2.0: **Web Based School Event Attendance System Using Biometric Chart**

Figure 2.0 shows the whole action of the system where in the input the admin can add event, Register Students Information and fingerprint details; in the process is the validation of information and registration of student information to database; and the output shows the list of registered students and printing attendance.

Hardware Specification

The hardware used in the system is divided into two categories-fingerprint scanner, which captures the fingerprint images, and a desktop computer which houses the database, the finger print scanner is connected to the computer via USB interfaces. Specifically, these are the following hardware specifications:

1. Desktop computer or laptop
2. Biometric reader/scanner
3. Printer

Software Specification

Software architecture consists of: the database and the application program. The database consists of tables that store records implemented in Microsoft SQL Server database. However, this can be migrated to any other relational databases of choice. SQL Server is fast and easy, it can store a very large record and requires little configuration. The application program is developed with MySQL using Php (Hypertext Pre-processor) framework and it provide a user interface for the employees, students and guests monitoring system. The search function allows users to search for specific information in the database such as name, year, course and other personal data.

Programming Environment

The Web-Based School Event Attendance System using Biometric is PHP and Visual Basic (VB.net) Project that manages the School's to entering event. The purpose of this system is to improve the process of checking the Log-in and out of the students in JHCSC Dumingag Campus and monitor their log-in in every event. The system stores the list of students. The officers will have system access and they will be in charge of monitoring the students' attendance during the event that they are assigned. The source code is very strict on when can officer checks attendance and display the result.

Related Studies

This section presents the related studies which provides the needed ideas, inspiration and background of the study.

Almazan, et.al, (2012) proposed Identity Verification and Entry Control System with a Counter. It is a computer based system with the help of digital and logical circuit concepts that enables it to have interconnections to other subsystems. A software application will be installed on the computer that serves as the means of communication of the system to the user and with other system or devices connected to the main system. This enables the user to manage records in the database, generate barcode and generate a summary of individuals that are in the school premises.

The study developed by Rao S and Satoa KJ (2013) uses the biometric technology to automate the process of taking the attendance of employees in the organizations. The study aims to develop an accurate, fast and efficient attendance

system using the fingerprint verification technique. The fingerprint verification is done by using extraction of minutiae techniques.

Similar study conducted by Oloyede MO et al. (2013) focuses on the biometric technology and determines the specific biometric identifier that can be used to enhance their traditional staff attendance system which presently affects the productivity of the organization.

The study developed by Dhiraj R. Wani, Tushar J. Khubani, Prof. Naresh Thoutam (2014), NFC Based Attendance Monitoring System with Facial Authorization is a Near Field Communication Technology (NFC) as technology has a number of advantages which is based on a wireless communication interface that has been used for quite a while. Attendance for school and collages is a necessity, smart system for schools and collages attendance using NFC is an automated process and financially cheap which can provide system accuracy and security. The reader device will be paced at every class room, the student and staff will simply tap their android devices to the NFC reader device to sign in their attendance. This system will generate a final report of attendance sheet of individual students. The basis of report generated is the percentage of attendance that can be efficiently calculated and this system detects the entry tag and exit along with facial authorization.

In the study of Olaniyi O.M et,al. (2012) "Student Exeat Monitoring System Using FingerPrint Biometric Authentication And Mobile Short Message" by using nexus combination of Ubiquitous Mobile Computing Technology through mobile short message service and biometric fingerprint approach exeat management and monitoring is quick and easy. The system shows that exeat monitoring system is less prone to forgery as stakeholders are carried along, capable of preventing impersonation among students and provide absolute electronic compliance to the policy.

The study of Elijah et,al. (2017) "Staff Monitoring System Using Biometric" fingerprint biometric system used to eliminate the problem being faced by traditional paper and pencil attendance register being provided in the organization.

In the study of Seng Chun Hoo and Haidi Ibrahim (2019) "Biometric-Based Attendance Tracking System for Education Sectors: A Literature Survey on hardware Requirements" states that the application of biometric recognition in personal

authentication enables the growth of this technology to be employed in various domains. The implementation of biometric recognition system can be used on physical or fingerprint, and face.

Local Studies:

The use of biometric attendance recording system (BARS) and its impact on the work performance of Cabanatuan City Government Employees.

Biometric Attendance Recording System of the Local Government Unit(LGU) of Cabanatuan City uses Biometric technology to provide a more comprehensive system in monitoring employee attendance and how it may affect their performances. The study assesses the impact of the use about the Biometric Attendance Recording System (BARS) on the work performance of Local Government Unit (LGU) employees based on their Individual Performance Commitment Review (IPCR) rating and the respondent's self-assessment and perception.

Biometric Attendance Monitoring System

Through all identified problems and issues encountered in monitoring attendance of Cagayan State University –Lasam Campus, Philippines, (CSU –Lasam), they come up the idea of developing Biometric Attendance Monitoring System (BAMS). The study used biometric fingerprint reader to facilitate in monitoring employee's attendance. It aims to have a reliable attendance reports of all employee in the University.

Classroom Attendance using Biometric with SMS Notification for JHCSC-Dumingag Campus

In the study "Classroom Attendance using Biometric with SMS Notification" of Tambula, et.al (2019) use biometric to monitor the classroom attendance of the students. The system will improve the way of checking the classroom attendance using fingerprint as a form of authentication as proof of attending the classes. It will facilitate a faster and easier way of checking the attendance of the students. It will also send message to the parents to be aware if their students really attending on their school classes.

Foreign Studies:

Attendance System Using Nfc Technology And Embedded Camera Device On Mobile phone.

In the study of R. RajaMurugan, T. Rohan and G. SakthiSankarapandian (2015), Attendance System Using NFC Technology and Embedded Camera Device on Mobile phone used Near Field Communication Technology (NFC) to rectify the systematic failing of taking attendance of the students. NFC is a set of communication protocol that enables communication between two electronic devices over a distance of 4 cm or less. It offers a low-speed connection through a simple set-up that can be used to bootstrap more capable wireless They put the NFC tag into service. Each tag has a unique ID, precluding the duplication of a tag. These NFC tag are given to students of Apply Mathematic department, Faculty of and while students entering classrooms and touch these tag on instructor mobile phone, NFC readers program on instructor's mobile phone will read these tags, identify the students from their respective NFC tag and send the data to an instructor's mobile phone.

Fingerprint-based Attendance Monitoring System

Monitoring student attendance in the UK use biometric-based solution to adapt the legislative pressures on data governance and information security which can grant precise, decent data for the institution to be use in future reports to UKBA. All biometric techniques obviate to need to carry a token or card, or to remember several passwords, and reduce the risk of lost, forgotten or copied passwords, robbed tokens or over the shoulder intrusion, this project shall focus on using fingerprint recognition, mainly due to the low-cost of devices for deployment and high user compliance.

Synthesis

In the Web-based School Event Attendance System using Biometric, the student will time-in and time-out in the monitor using biometric. The data will automatically store in the database. After the event, the in-charge can print the copies of attendance record.

The developed system has similarities to the study of Tambula, et.al (2019), reported that the use of biometric technology can improve the way of checking the classroom attendance. With the use of biometric monitoring system, checking

attendance of the students become easier and faster. The study proposed a project to develop a biometric-base attendance system. Most of study that uses biometric usually on school class attendance and attendance for employees in an organization. The current system will use biometric in taking attendance of every student in a particular school event or activities happened in the school campus/universities and then the system can also generate a printed report of attendance recorded with a status if the student attended or not the school.

Chapter 3

METHODOLOGY

This chapter presents the methods used such as the following: Planning, System Analysis, System Design, System Testing, Implementation and Maintenance.

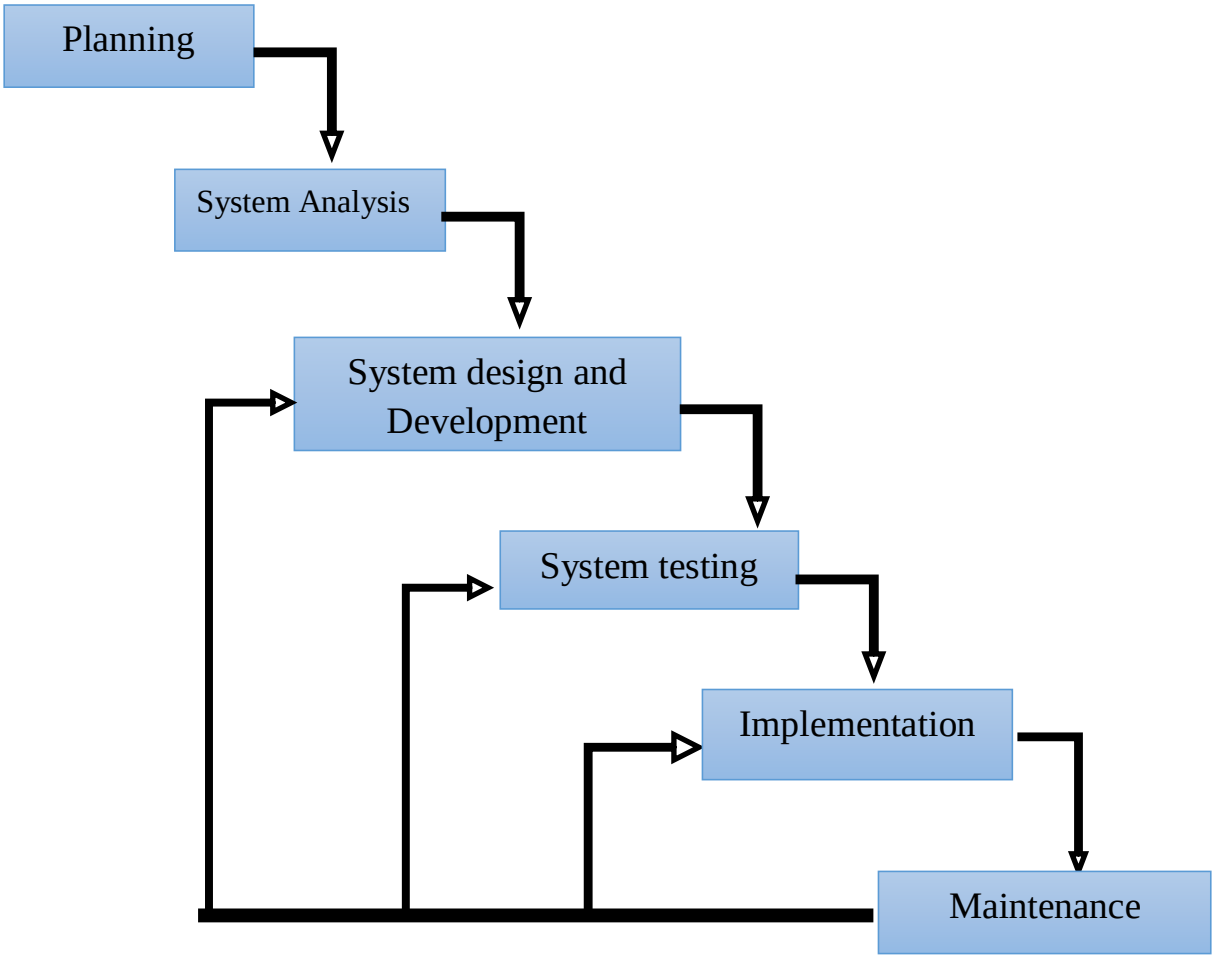

Figure 3.0 **The Waterfall Model**

Figure 3.0 shows the waterfall model, a direct flow of the series of steps in creating the system. The researchers do the planning. After planning, the researchers started to analyze the system, then it undergoes in the system design and development, system testing, implementation and maintenance.

Planning

In this phase, the researchers conducted an interview to selected SSC Officers who usually do the checking of attendance of students every school events and some of the students in JHCSC Dumingag Campus regarding on how the actual system of attendance checking works. Also, they gathered their opinion on the current attendance system that they are using. They take note all the ideas they got that could possibly use in their study.

System Analysis

In this phase, the researchers presented all the gathered data to the team for analysis and to identify the problems of the current system. Then, the team creates a plan on what will be the best way to create a system that will improve the manual process of checking attendance of every student during school event.

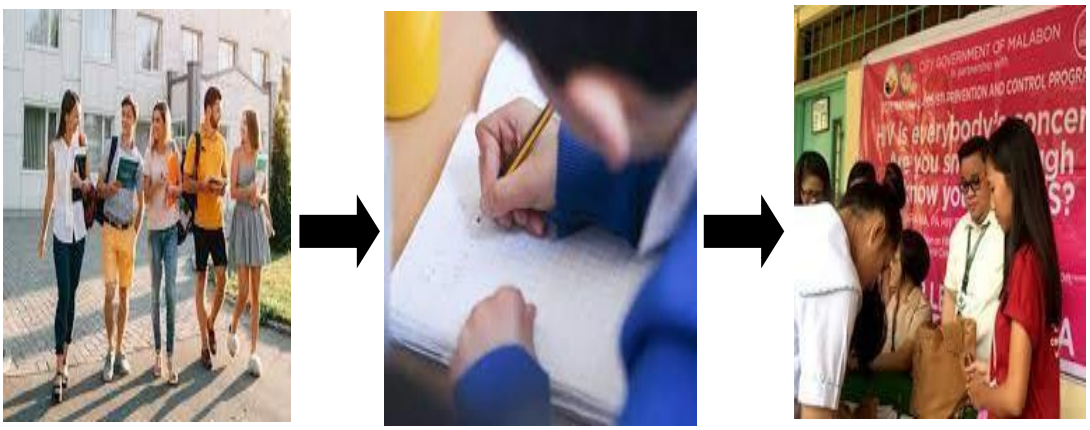

Figure 3.1: **Current System Flow**

Figure 3.1 shows the manual process of checking attendance of the students every school event. The students automatically write down their names in a piece of attendance sheet provided by the person in-charge.

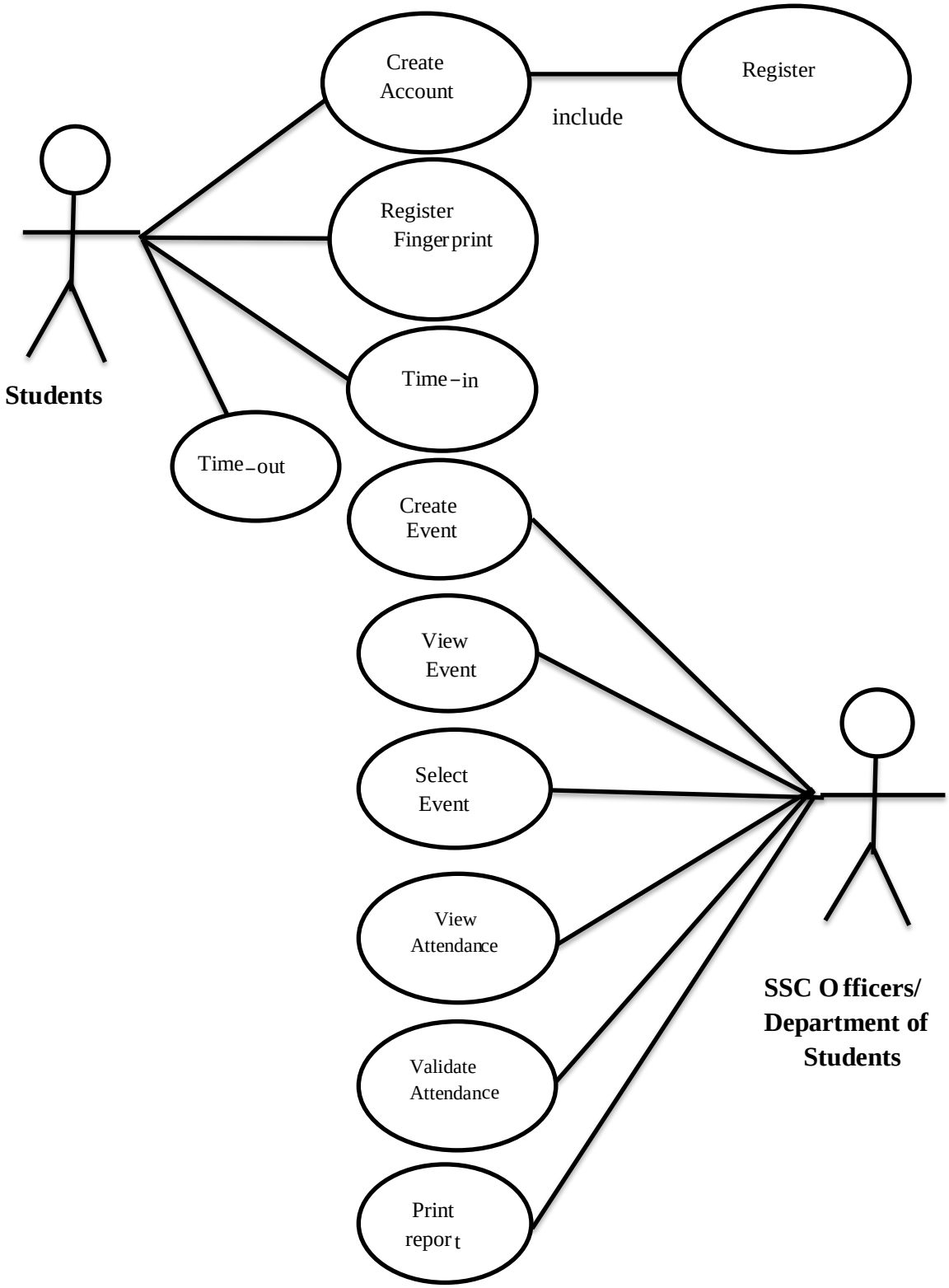

Figure 3.2: **Used Case Diagram of the System**

Figure 3.2 shows the roles of the key individual in this system: student and the in-charge. The student will create an account to be registered online/offline, register their fingerprint to the database with the use of biometric scanner and their time-in and time-out to the system. The function of the SSC officers and DSA is that they the one who can create, view and select events, view and validate attendance and download and print report.

System Design

In this phase, with regards to the problem of the existing system, the researchers came up an idea to make it easier for the students to time-in and time-out during any school events or activities. The diagram below shows the proposed system that can be used in JHCSC-Dumingag to improve their manual process of monitoring and keeping the record of students who had attend on that event.

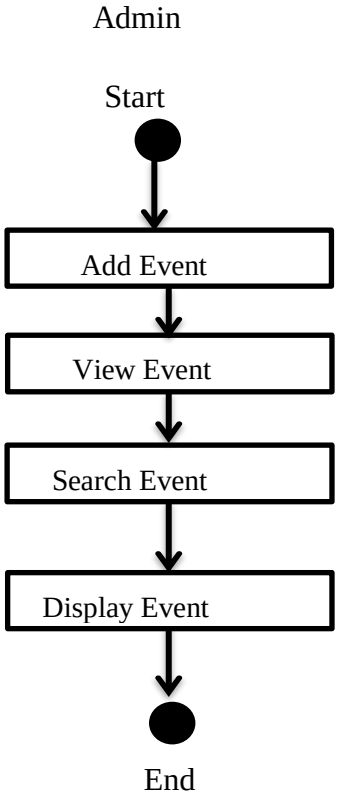

Figure 3.3: **Admin (Add Event)**

Figure 3.3 shows' that the admin can add event. Furthermore, the admin can also view the list of the events added in the system. They can also search event and display event list.

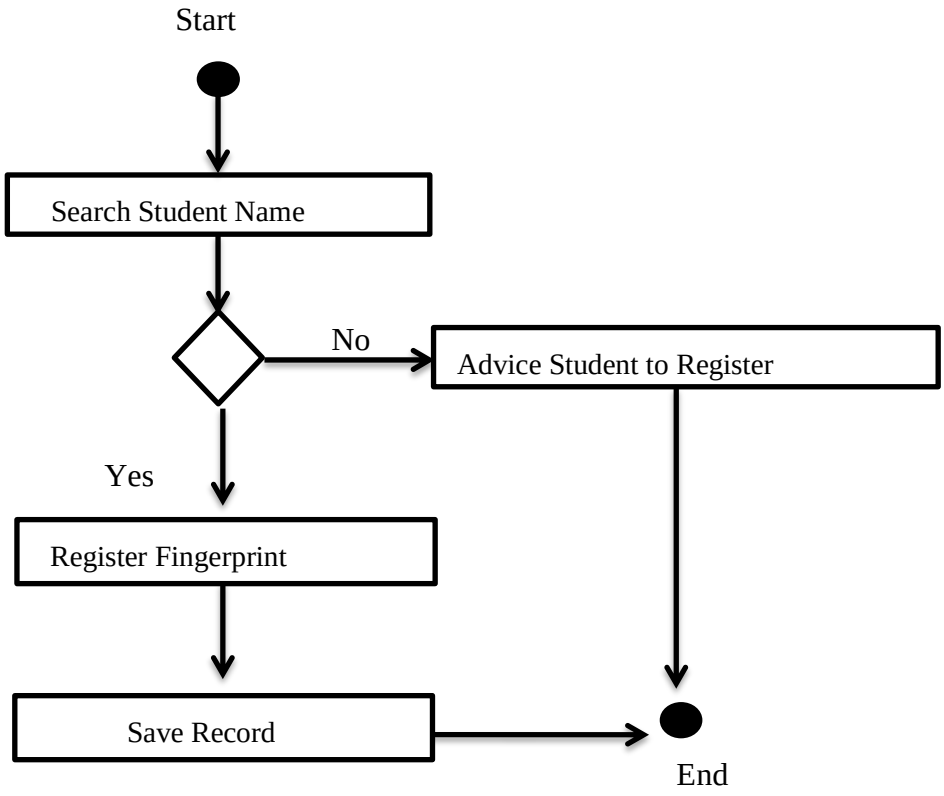

Figure 3.4: **Admin (Register Students Fingerprint)**

Figure 3.4 shows' that the admin will search the name of the students' as they registered their fingerprint. If the students' name not found in the system, the students are advice to register by creating an account. If the students' name found, the students can automatically register their fingerprint and save to the database.

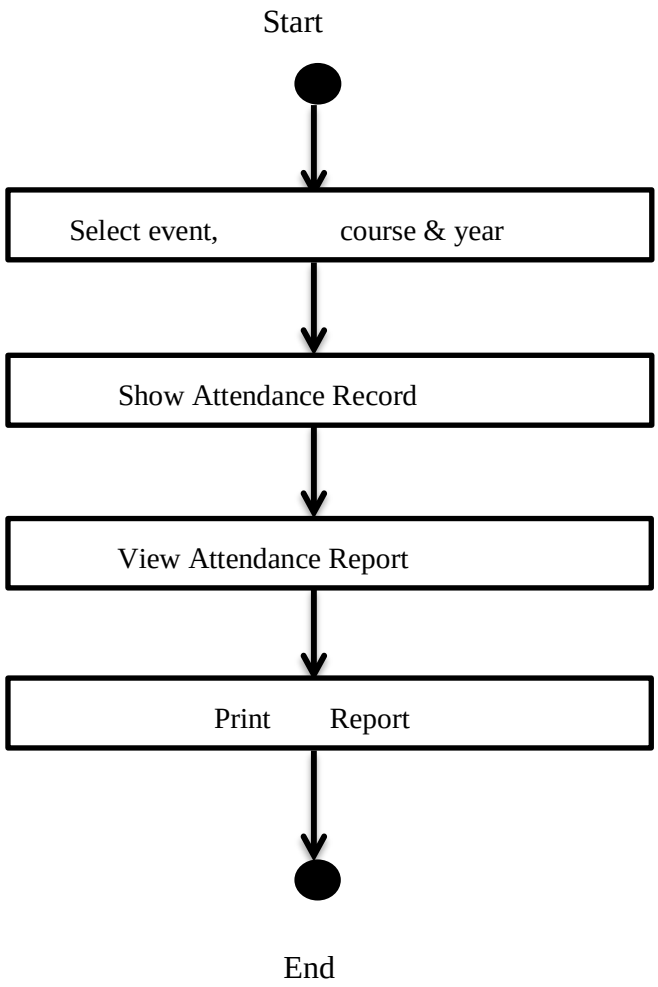

Figure 3.5: **Admin (Report)**

Figure 3.5 shows that the admin will do the selecting of event, course and year. The admin can show attendance record, view attendance report and print attendance report.

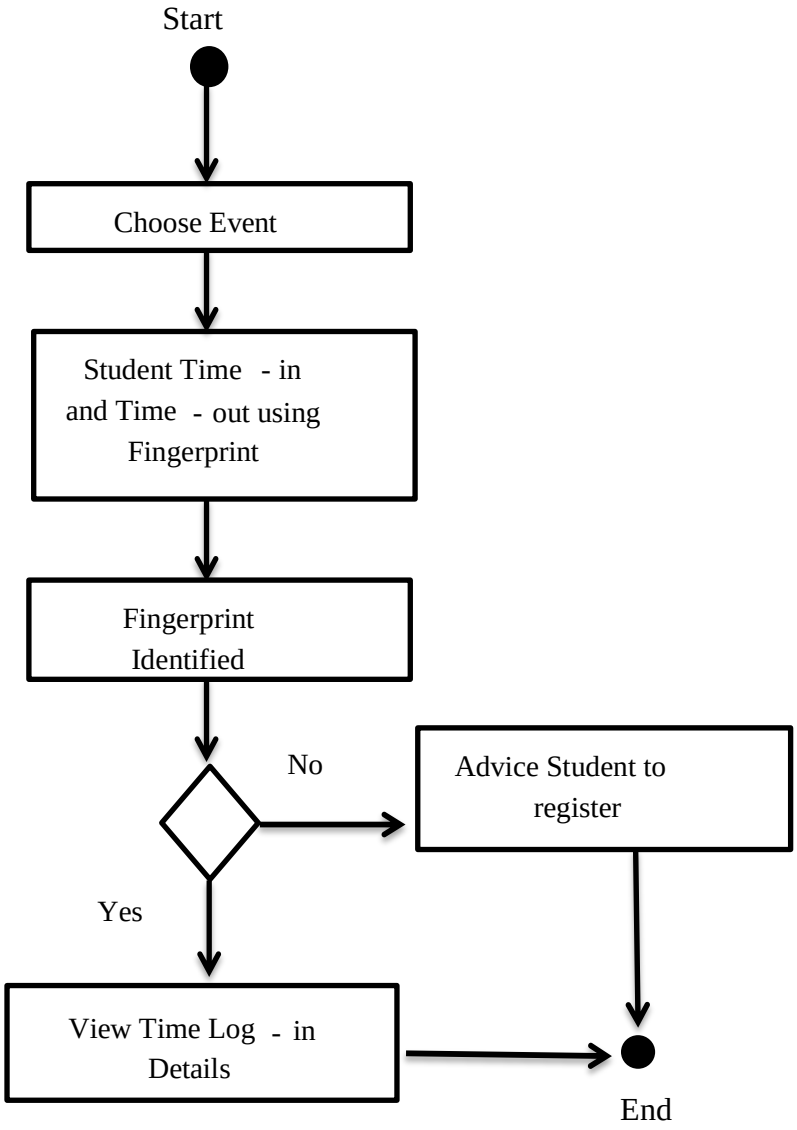

Figure 3.6: **Admin (Student Log in)**

Figure 3.6 shows' that the admin will be the one to choose an event for the students to time-in and time-out. The student will time-in and time-out using their fingerprint. If the fingerprint of the student match not found, the student advice to register their fingerprint. If the student fingerprint matched, they can view their time log-in details.

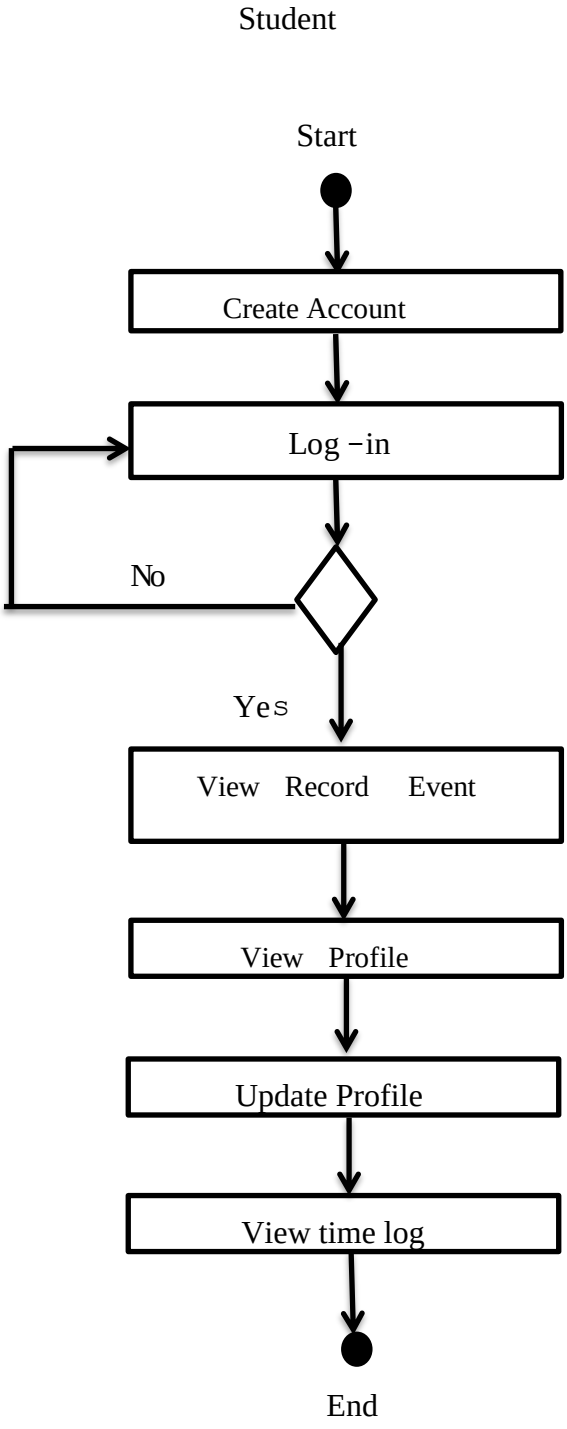

Figure 3.7: **Student Account**

Figure 3.7 shows' that the student will create an account and log-in. If they are failed to log-in, the student advice to go to the admin to get the correct username and password. If the student got logged in, they can view record event. Student can view and update their profile. They can also view their time log of every event.

Chapter 4

DEVELOPMENT, TESTING AND IMPLEMENTATION

Description of the System

The system uses biometric scanner in getting the attendance of the students every school events/activities. It was designed to have two users: the system administrator or the person in-charge and the students.

- The system administrator tasked is to operate the system. It has also the authority to register the fingerprint of the students, adding events and print attendance report.
- The student will only register their fingerprint in the system using biometric scanner. It also time-in and time-out in the system during the school event

Gantt Chart

In a Gantt Chart, Figure 4.0 shows the working schedule of the researchers. During the development of the system, the researchers execute a variety of task. The bar indicates the length work in weeks and the task name, which is planning, system analysis, system design and development, system testing, implementation and maintenance in the diagram below.

	Nov. 2021			Dec. 2021					January				February				March				April				May				
Planning																													
System Analysis																													
System Design and development																													
System Testing																													
Implementation																													
Maintenance																													
	W1	W2	W3	W1	W2	W3	W4	W5	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W5

Table 4.0: **Gantt Chart**

Development

The system took seven months (7) to finish as shown in figure 4.0. During the requirement gathering, researchers interviewed selected SCC officers and students of JHCSC Dumingag about the existing process of checking of attendance of students during school events. This includes the challenges faced by the students while implementing the manual process and an opportunity to be addressed by the system. After gathering the necessary data, the researchers analyzed the existing problems of checking attendance of students during school events. This includes the strengths and opportunities of the proposed system as a tool in upgrading the manual process of checking attendance of the students.

During the design phase, the researchers conducted research about related studies that uses biometric. This helped the researchers to design an effective algorithm for both front-end and back-end of the system.

Testing

Evaluating the performance of the system was done in this phase and to check the possible errors to ensure that the system was applicable and reliable. The researchers tested the developed system using biometric to the selected 5 students and 5 SSC officers of J.H. Cerilles State College Dumingag Campus to test the systems' capability. During developing of the project, there were some error that occurred such as the biometric scanner can't detect the fingerprint immediately. As a result, 96.66 % said that the system is very satisfactory and 3.34% satisfactory. Therefore, the researchers conclude that the system meet the objectives of the system that leads to give good benefits to the students, teachers, DSA and SSC Officers.

Implementation

This phase described how the system will be deployed, installed, and transformed into an operational system. The system was installed and the future users undergo training on how to use the system.

STRATEGY	ACTIVITIES	PERSONS INVOLVED	DURATION
Approved from the Administrator	Defend The System	Researchers and Administrators	1 day
System Installation	Installation of the required software/hardware	Researchers and Administrators	5 hours
Information Distribution	Distribution of manuals information	Researchers	1 week
User Training	User will undergo training on how to operate the system	Users	3 days

Table 4.1: **Implementation Plan**

Maintenance

After implementation, there were runtime errors or minor bugs needed to be fixed in order to have a smooth and clean system. In this phase, changes and update will be conducted to improve the system.

Chapter 5

RESULTS, DISCUSSION, CONCLUSION AND RECOMMENDATION

Results and Discussions

This chapter presents the results and outcomes based on the main objectives of the study. It also discusses each of the following specific objectives of the study:

Module wherein the student can time-in and out using Biometric

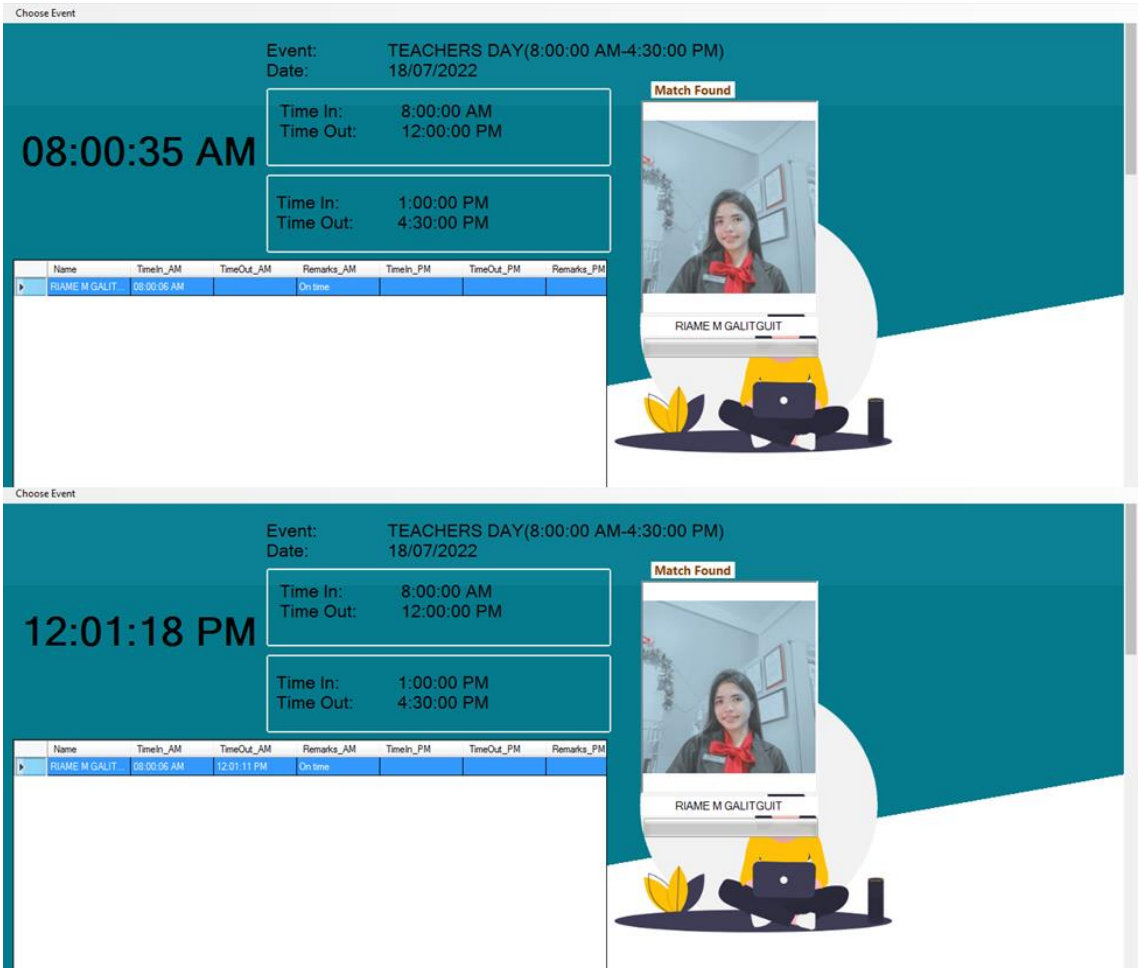

Figure 4.0: **Student time in and time out**

Figure 4.0 Shows a form for the student to time in and time out. Students need to scan their fingerprint to the biometric reader for them to log in and out into the system. The system will indicate the time when did the student time-in and out with

remarks if they are late or not. It will also show students profile, the event name, the date of the event, and the time duration of the event.

Module that will verify the student.

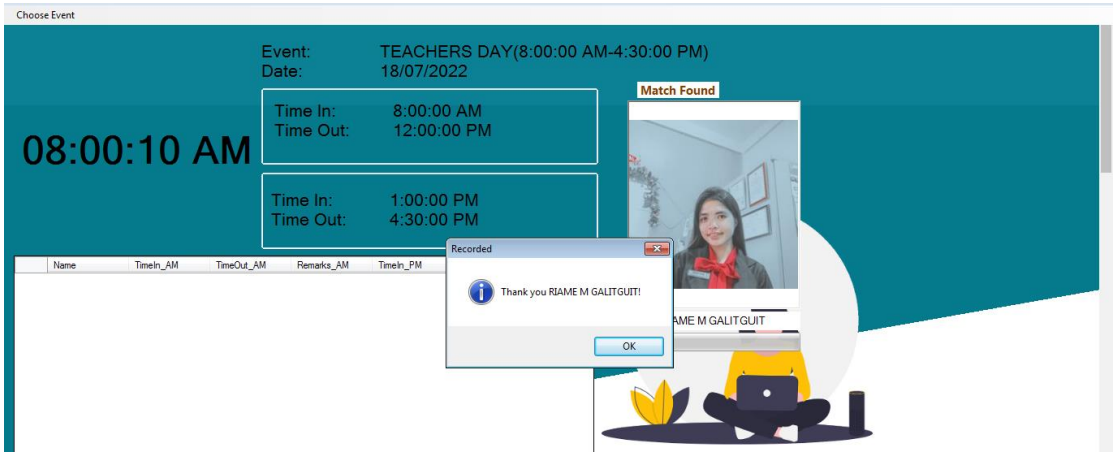

Figure 4.1: **Student's Verification**

Figure 4.1 displays the profile and name of the verified students before they time-in and time-out and the time they login and out.

Module that provides consolidated records of attendance that can be used for school accreditation and in signing of clearance .

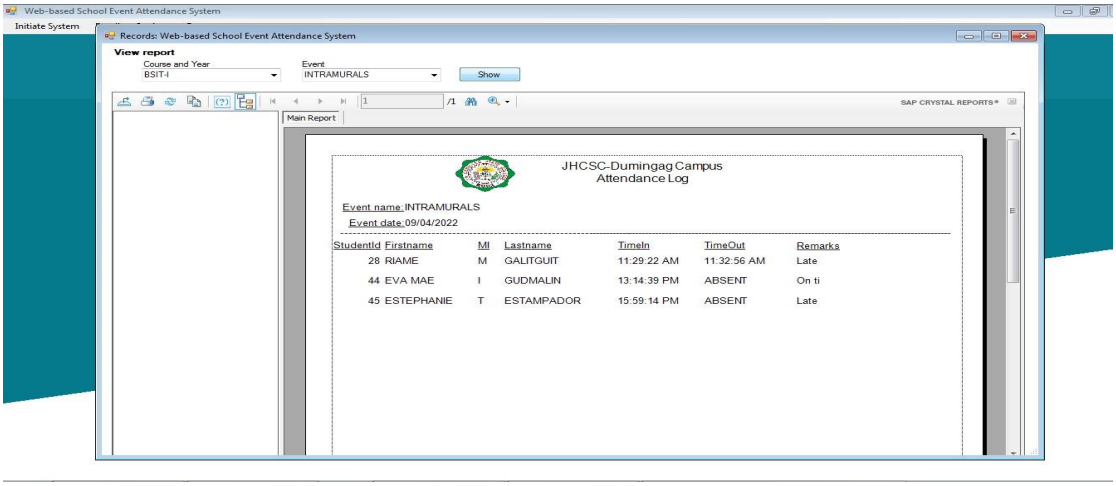

Figure 4.2: **Student's List**

Figure 4.2 shows all the list of the students' present in that school event. The admin can select department and event to download or view attendance.

Student Registration to online

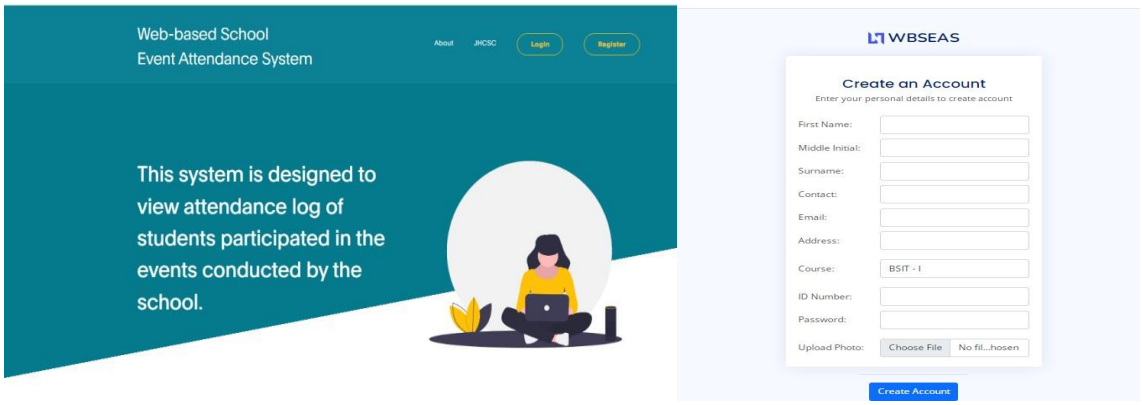

Figure 4.3: **Student Registration Form**

Figure 4.3 displays a form for the students to register online. Students need to fill up the form for them to be registered into the system.

Conclusion

It was concluded that the system was able to meet the objectives of the project. The developed system could check the attendance using the biometrics of the student, the system has a module wherein the student login using fingerprint reader, could monitor the attendance record of the students in every department, could provide accurate attendance record that can be used for School accreditation and signing of clearance and the system could also give the authorized users appropriate access for adding and updating of information.

Recommendation

From the conclusion drawn, the following recommendations are hereby offered:

That the school will adopt the newly-developed system and implement it to avoid time consumption in manual checking of attendance of the students, and that the further enhancements like the fingerprint reader built behind the touchscreen monitor and face recognition. The developments be pursued by the succeeding studies or researchers to increase School Event Attendance using Biometric for the JHCSC School fundamentals functionalities and to eliminate possible undiscovered bugs.

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Research Gate (2016). Smart Mobile Attendance System using voice recognition and fingerprint on smartphone.

Iiste.org Journal (2004). Development of Fingerprint Biometric Attendance System for Non-Academic Staff in a Tertiary Institution

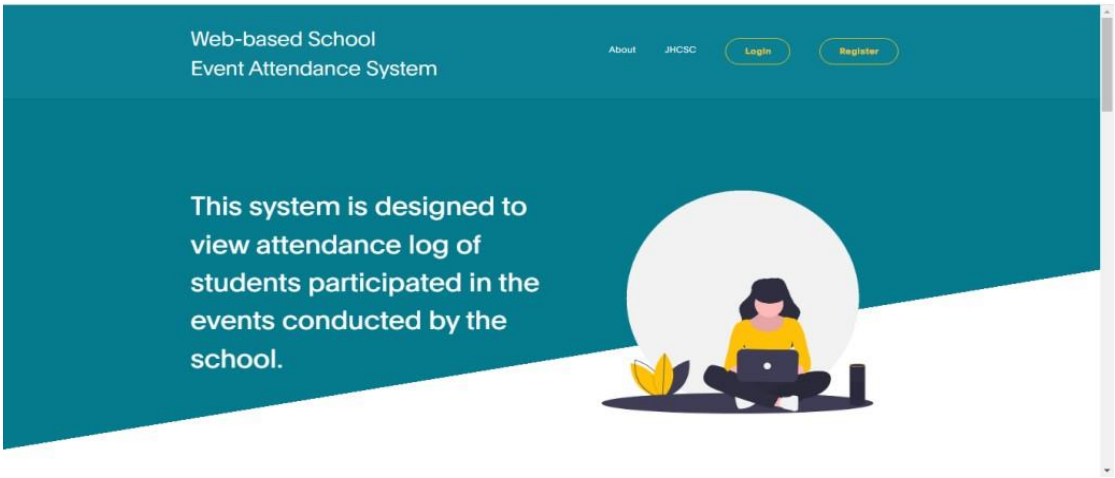
Research Gate (2015).Students Exeat Monitoring System Using FingerprintBiometric Authentication and Mobile Short Message Service.

Great Schools Org (2016). Great leaders for great school. https://www.americanprogress.org/article/great-leaders-for-great-schools

APPENDIX “A”

USER’S MANUAL

STUDENTS’ HOMEPAGE

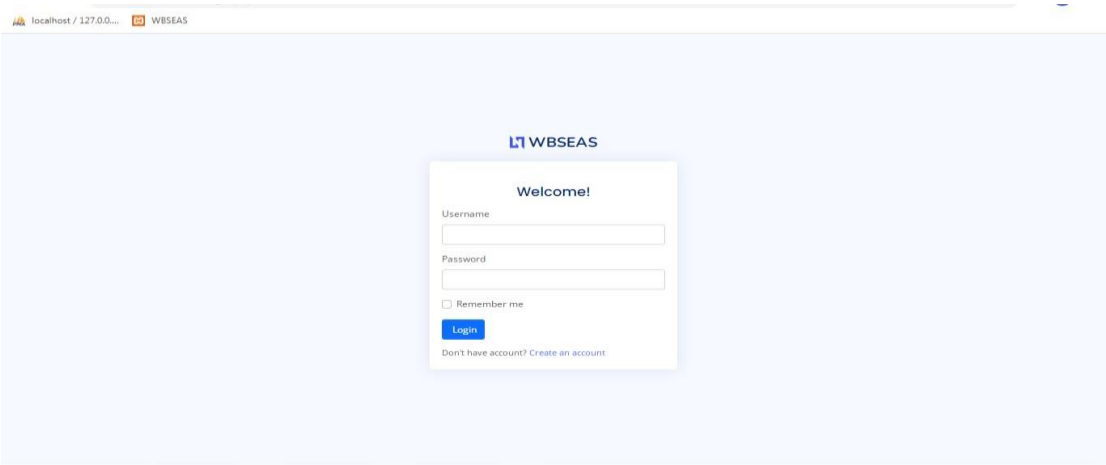


This is the students’ homepage where in the student can choose either they will register by creating an account or login to their account. S

STUDENTS’ REGISTRATION FORM

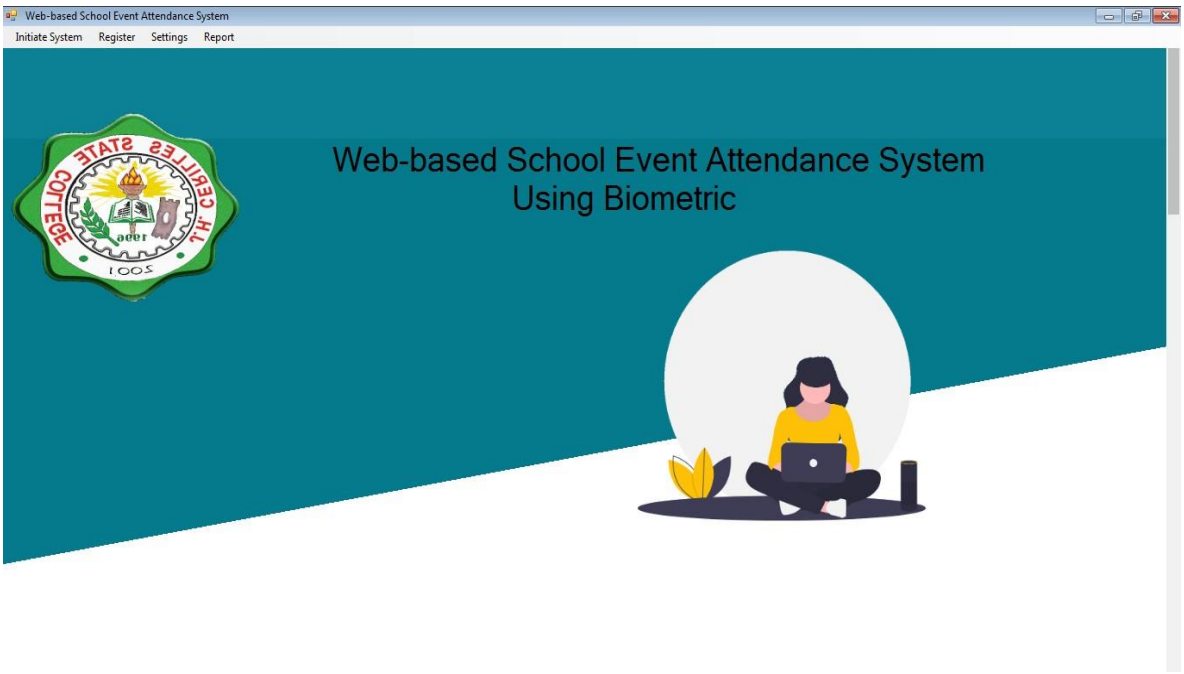
This is the Students’ Registration form where in the student must enter their personal details to create an account.

STUDENT LOG-IN FORM



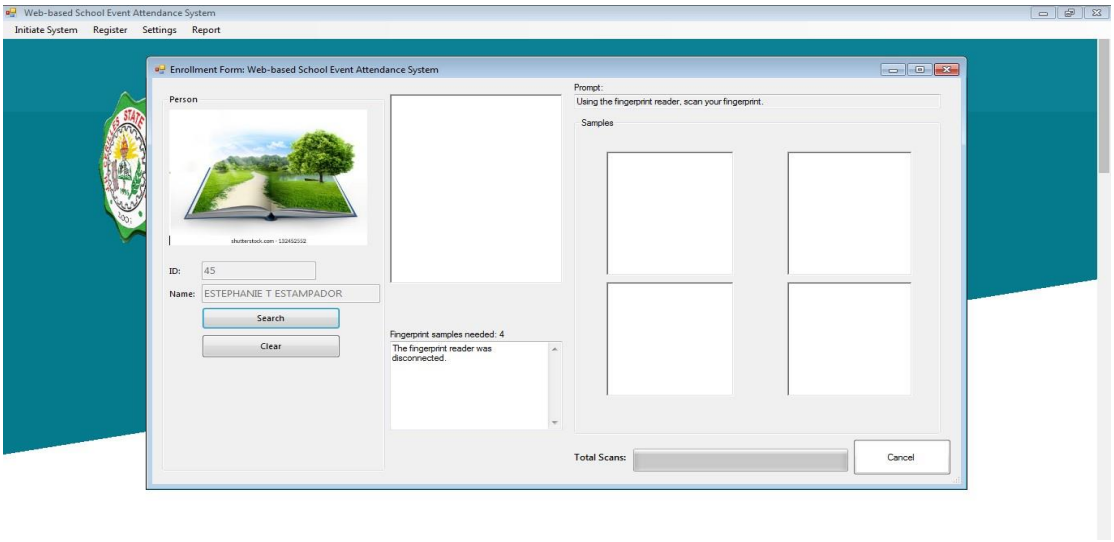
This is the Log-in form where the student must enter the username and password to access their account.

ADMIN HOMEPAGE



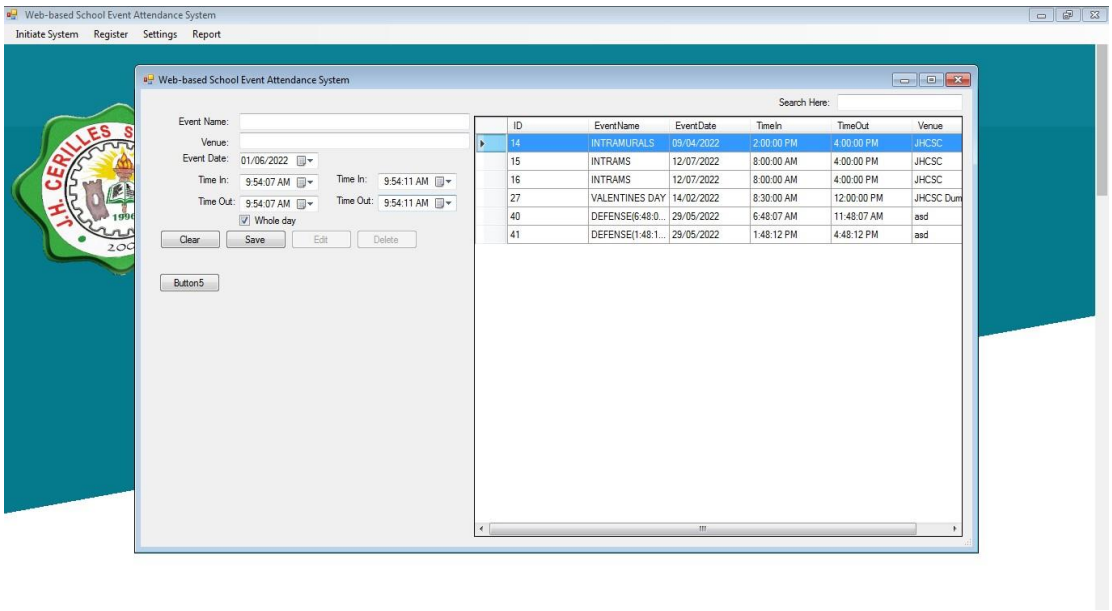
This is the homepage of the system or a start-up page where the admin can view and select the following features: Initiate System, Register, Settings and Report**.**

FINGERPRINT REGISTRATION



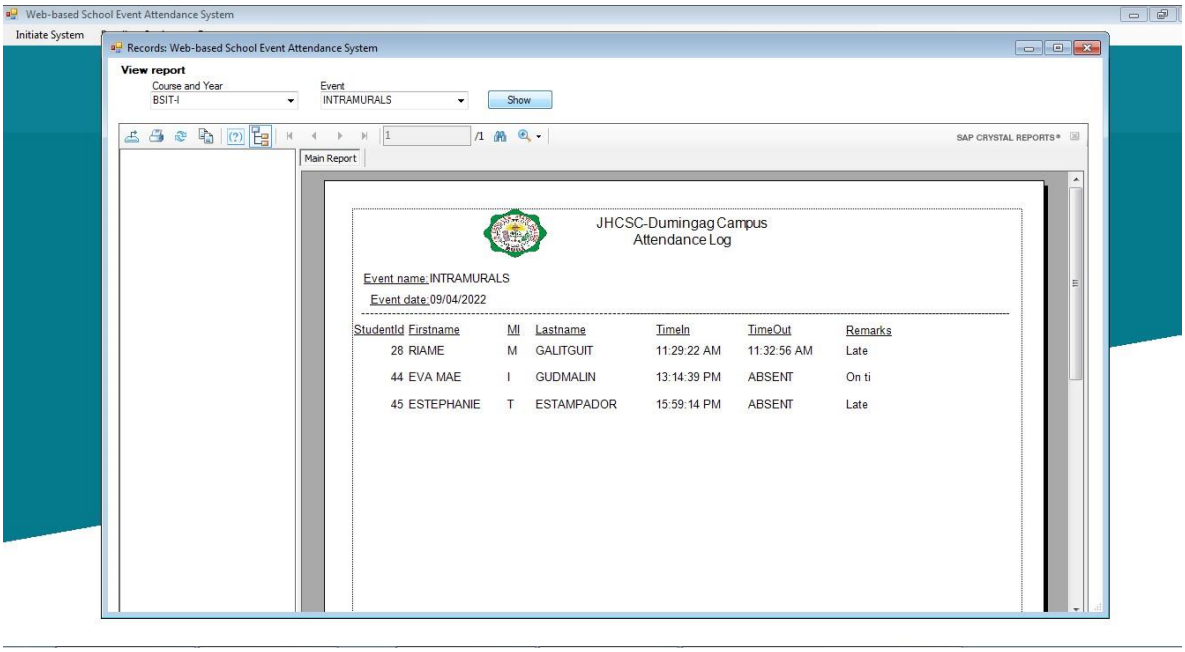
This is the fingerprint registration form where the admin will get the fingerprint of the student using biometric scanner. The Fingerprint of student continue to be scan until the green bar will be full and saved into the database.

ADDING EVENT FORM AND THE EVENT LIST



This is the adding event form where the admin can add any school events and activities. They can also view the event listed or added on the system

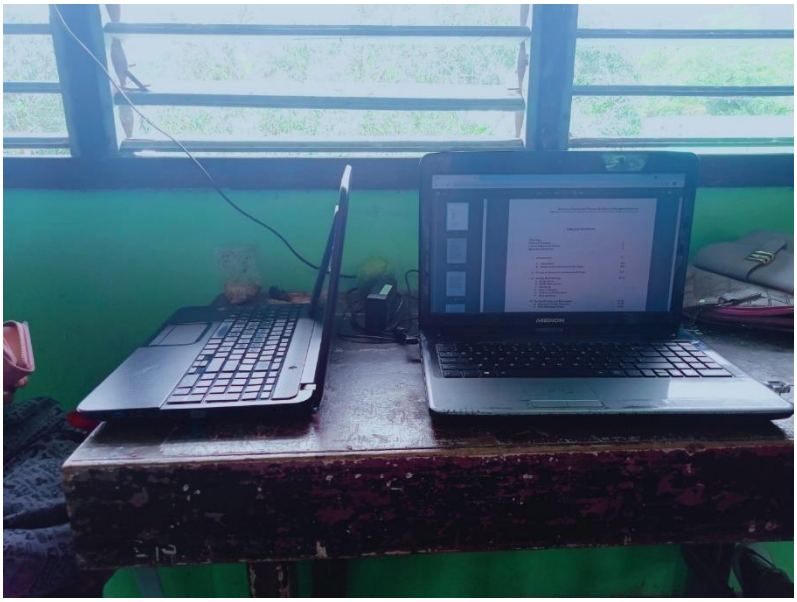
ATTENDANCE LOG



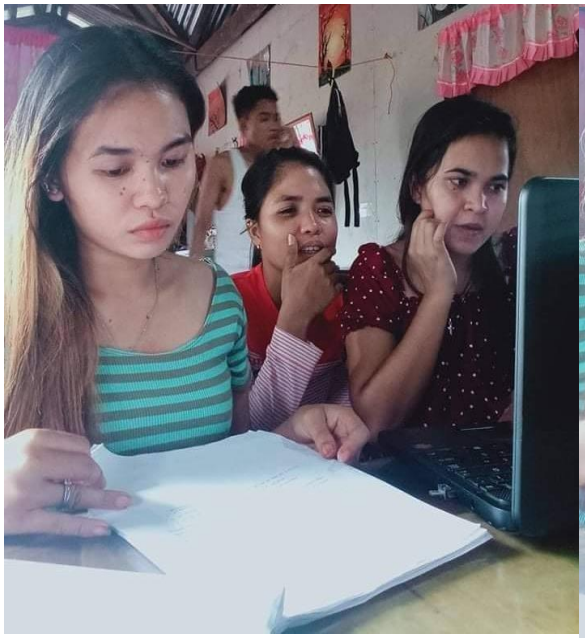
This is the attendance log where the admin can select what course and events to be displayed. They can also view students' attendance record and print attendance report.

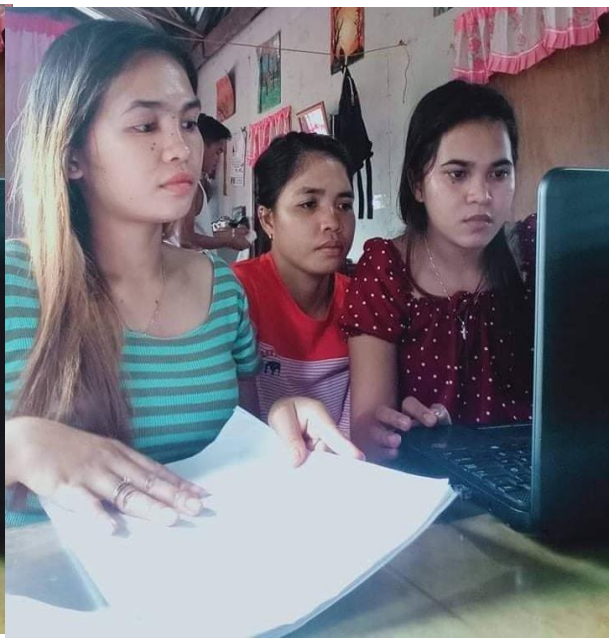
APPENDIX “C”

PHOTO DOCUMENTATION

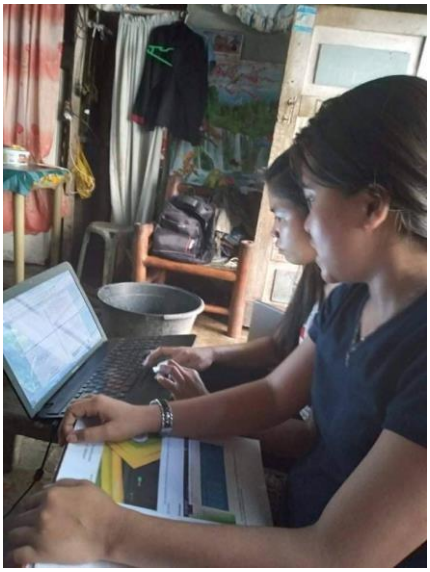


The researchers share their ideas regarding the requirements and the design of the system.





Editing manuscript as corrected by the adviser.



Editing manuscript as corrected by the panelist and critic.

Conduct testing in 5 selected students and 5 selected SSC officers of J.H. Cerilles State College Dumingag Campus.

APPENDIX “D”

POSTER DESIGN