

CLOUD BASED ATTENDANCE SYSTEM

A PROJECT REPORT

Submitted by

Aryendra Agnihotri (20BCS4230)

Anurag Tomar (20BCS4245)

Ankit Ahir (20BCS4223)

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BONAFIDE CERTIFICATE

Certified that this project report **“CLOUD BASED ATTENDANCE SYSTEM”** is the bonafide work of **“Aryendra Agnihotri (20BCS4230), Anurag Tomar (20BCS4245) & Ankit Ahir (20BCS4223)”** who carried out the project work under the supervision of **“Ms Ramneet Kaur”**.

SIGNATURE

Prof. Aman Kaushik

HEAD OF THE DEPARTMENT

AIT-CSE

SIGNATURE

Ms. Ramneet Kaur

SUPERVISOR

Submitted for the project viva-voce examination held on 19-November-2022.

INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

Student attendance management system deals with the maintenance of the student's attendance details. It generates the attendance of the student on the basis of presence in class. It is maintained on the daily basis of their attendance. The staff will be provided with a separate username & password to make the student's status.

The staff handling the particular subjects are responsible to make the attendance for all students. Only if the student presents on that particular period, the attendance will be calculated. The students' attendance reports based on weekly and consolidated will be generated.

GRAPHICAL ABSTRACT

Why Do You Need The Best Online Attendance Management System?



figure i

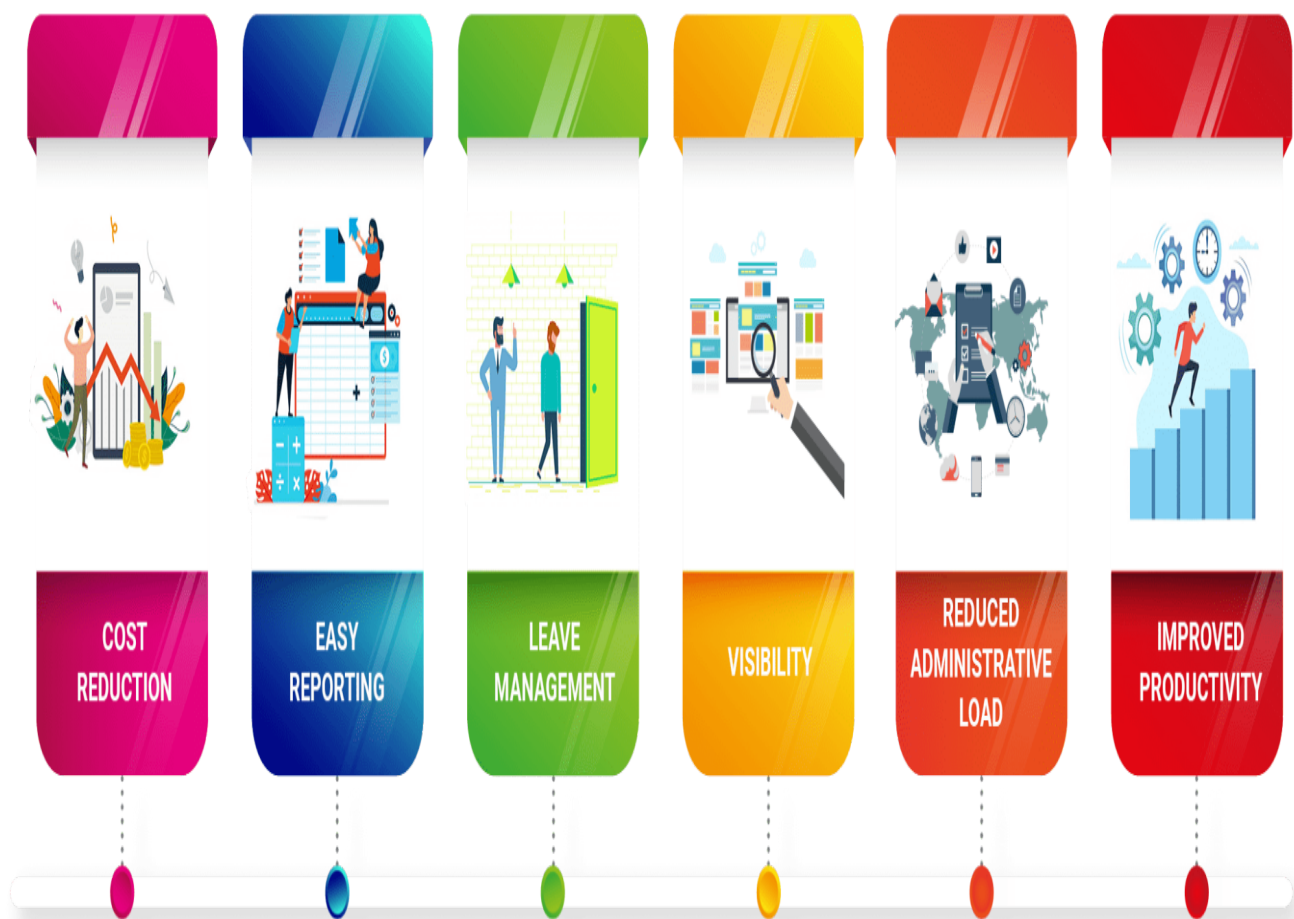


figure ii

Potential Issues With Attendance Management Software



figure iii

CHAPTER 1.

INTRODUCTION

1.1. Client Identification/Identification of relevant Contemporary issue

Attendance Management System is software developed for daily student attendance in schools, colleges and institutes. It facilitates to access the attendance information of a particular student in a particular class. The information is sorted by the operators, which will be provided by the teacher for a particular class. This system will also help in evaluating attendance eligibility criteria of a student.

1.2. Identification of Problem

The purpose of developing attendance management systems is to computerize the traditional way of taking attendance. Another purpose for developing this software is to generate the report automatically at the end of the session or in the between of the session.

1.3. Identification of Tasks

The scope of the project is the system on which the software is installed, i.e. the project is developed as a desktop application, and it will work for a particular institute. But later on the project can be modified to operate it online.

CHAPTER 2.

LITERATURE REVIEW/BACKGROUND STUDY

2.1. Proposed solutions

Our system has two types of accessing modes:-

- i. Administrator
- ii. User Teacher Student

(i) Administrator: Administrator has rights to manage student details, add a new student, provide register number for all students, assign each student a course etc., Administrator can update his profile, and also can give help to the teachers and students.

(ii) User: There are two users:-

Student: -Student do the login and see profile, Attendance Details etc.

Teacher:-Add student, view the student details and take attendance.

This software gives access to two kinds of users.

1. Administrator: The administrators have features to add, delete and modify information stored in the database.
2. Authorized User: Teaching staff have access to view the data stored in the database and can update the student's attendance in the form of formatted reports. Students have access to view the data stored in the database.

2.2. Review Summary

Attendance is an integral part of education. The education industry was on a halt when the pandemic hit us. Teachers and students had to manage classes from their homes when there were no proper online curriculum or schooling strategies in practice. It was also challenging for schools to manage individual records of students digitally.

A cloud attendance management system is a dedicated software to manage the attendance records of students. It automatically tracks the progress of students and generates reports. It stores all the individual details of the students digitally on the cloud. Teachers and school management can access the data anytime. It then simplifies the job of teachers by maintaining attendance reports accurately. Since this method is entirely paperless, teachers don't have to worry about storing data.

An online attendance management system works in a straight line without chaos. It operates on the cloud, and it means users don't have to save every data or report. Initially, the system allows an authorized member of the school to register and sign up. Then you can enter the details of each student and store them in the cloud. Authorized staff can access the data from anywhere anytime. After entering the details of students, teachers can mark the attendance details in a click. Students can also apply for leave using this system. The system generates the attendance reports automatically. You can generate different types of reports like class-wise, subject-wise, month-wise, etc., for further analysis.

2.3. Problem Definition

To build a cloud based attendance management system to manage the attendance records of students. It will automatically track the progress of students and generate reports. It stores all the individual details of the students digitally on the cloud. Goals/Objectives.

Although manual time and attendance systems do have some positive points, they are not without faults. They may appear attractive in the short run, but they don't benefit your business in the long run.

1. Prone to buddy-punching

Manual attendance systems are plagued by buddy-punching and time-theft. Since the data is entered manually, it can easily be manipulated. The employee may provide inaccurate information.

2. Human error possibility

It is necessary to compile the attendance of students while considering their academics, compliance etc. When such tasks are performed manually, however, the chances of human error increase.

3. Time-consuming

Manually recording attendance is very time-consuming. As a consequence, performance and productivity can be affected. The manual process of collecting attendance data for all your employees will also take time. You might also end up spending a lot of time maintaining scorecards, rectifying errors in time entry, and so on.

4. No review of your eligibility requirements

Create a student attendance policy based on your school's priorities and principles. The Attendance Policy ensures that all school staff and managers are aware of good attendance practices. Try to review and follow your school's attendance policies, which include verbal warnings, written warnings, optional and mandatory vacation markings, vacation approval policies, etc.

5. Obsolete Systems

The use of obsolete systems carries the risk of system crashes, security issues and loss of valuable information: Have you thought about what could happen if your system does not process payroll correctly and becomes an employee complaint? A modern attendance management system reduces stress, saves time and improves accuracy.

2.4 Existing System

The existing system is a manual entry for the students and teachers' information. Here, the attendance will be carried out in handwritten registers. It will be a tedious job to maintain the record for the user. The system requires more human effort. The retrieval of the information is not easy because records are maintained in handwritten registers. This application requires correct feed in the respective input field. Supposed there were wrong inputs entered, the application resists requiring the user to input correct data.

General Objectives

This study aims to monitor the students' and teachers' attendance and to evaluate their performance according to their attendance.

Specific Objectives

- To record daily time record of the teachers
- To check the daily attendance of the students
- To maintain the security of the students and teachers within the school

Scope of the Existing System

The system covers all the students and teachers.. The system is applicable for teachers. It is limited only to students who have been monitored from time to time and who are officially enrolled and to the teachers.

Concept of Operation

Having a manual operation in a school or in a company brings a lot of work and sometimes this method causes errors in inputting data like basic student information that results in another set of work. In other words, manual operation also takes a lot of time and effort. In manual attendance monitoring, the teachers are using time sheets in their attendance, attendance log and attendance sheets. These are all paper works and these can easily get damaged and worst is that these can be tampered or modified. Security is also involved in this system.

2.5 Advantages

- Reduce paperwork and save time and money with mobile and cloud-based attendance management system
- Eliminate duplicate data entry and errors in time and attendance entries
- Improve visibility to track and manage student's attendance & absenteeism across multiple campuses
- Track the attendance of teachers and students.
- Keep the parents informed about the student's performance
- Auto-generate various types of reports of student attendance
- Increased security and confidentiality with role-based permissions to users.

2.6 Disadvantages

- Automatic calculation of leave and reward points accrued
- Automatic teachers and student evaluation about the attendance performance.
- Scheduling of events in the school

CHAPTER 3.

DESIGN FLOW/PROCESS

3.1. Evaluation & Selection of Specifications/Features

Module Description:-

The system should be designed in such a way that only authorized people should be allowed to access some particular modules. The records should be modified by only administrators and no one else. The user should always be in control of the application and not the vice versa. The user interface should be consistent so that the user can handle the application with ease and speed. The application should be visually, conceptually clear.

Administrator module:-

Student Details

This module deals with the allocation of roll no and personal details for the new batch. It will generate personal details and academic details of the students.

Teacher Details

It helps to allot the subject and the subject code to the particular staff. It provides the facility to have a username and password to the staff.

Report details

Reports can be taken daily, weekly and consolidated: Weekly report get all hour details of attendance starting date to ending date and display the status Consolidate report get all student attendance details starting date to ending date status help for the eligibility criteria of the student to attend the examination.

Teacher module:-

Attendance details

It assists the staff to mark attendance to the students for their subject. This will authenticate the staff before making the entry.

Report details

Weekly report get details of attendance from starting date to ending date and display the status. Consolidate report get all student attendance details from starting date to ending date status help for the eligibility criteria of the student to attend the examination.

Student module:-

Generate report; get details of attendance from starting date to ending date and display the status.

3.2. Design Constraints

System Maintenance Software maintenance is far more than finding mistakes. Provision must be made for environment changes which may affect either the computer, or other parts of the computer based systems. Such activity is normally called maintenance. It includes both the Improvement of the system functions and the corrections of faults which arise during the operation of a new system. It may involve the continuing involvement of a large proportion of computer Department resources. The main task may be to adapt existing systems in a changing environment. Backup for the entire database files are taken and stored in storage devices like Flash drives, pen drives and disks so that it is possible to restore the system at the earliest. If theirs is a breakdown or collage, then the system gives provision to restore database files. Storing data in a Separate secondary device leads to an effective and efficient maintenance of the system. The nominated person has sufficient knowledge of the organization's computer passed proposed change.

3.3. Design Flow

At least 2 alternative designs/processes/flow to make the solution/complete the project.

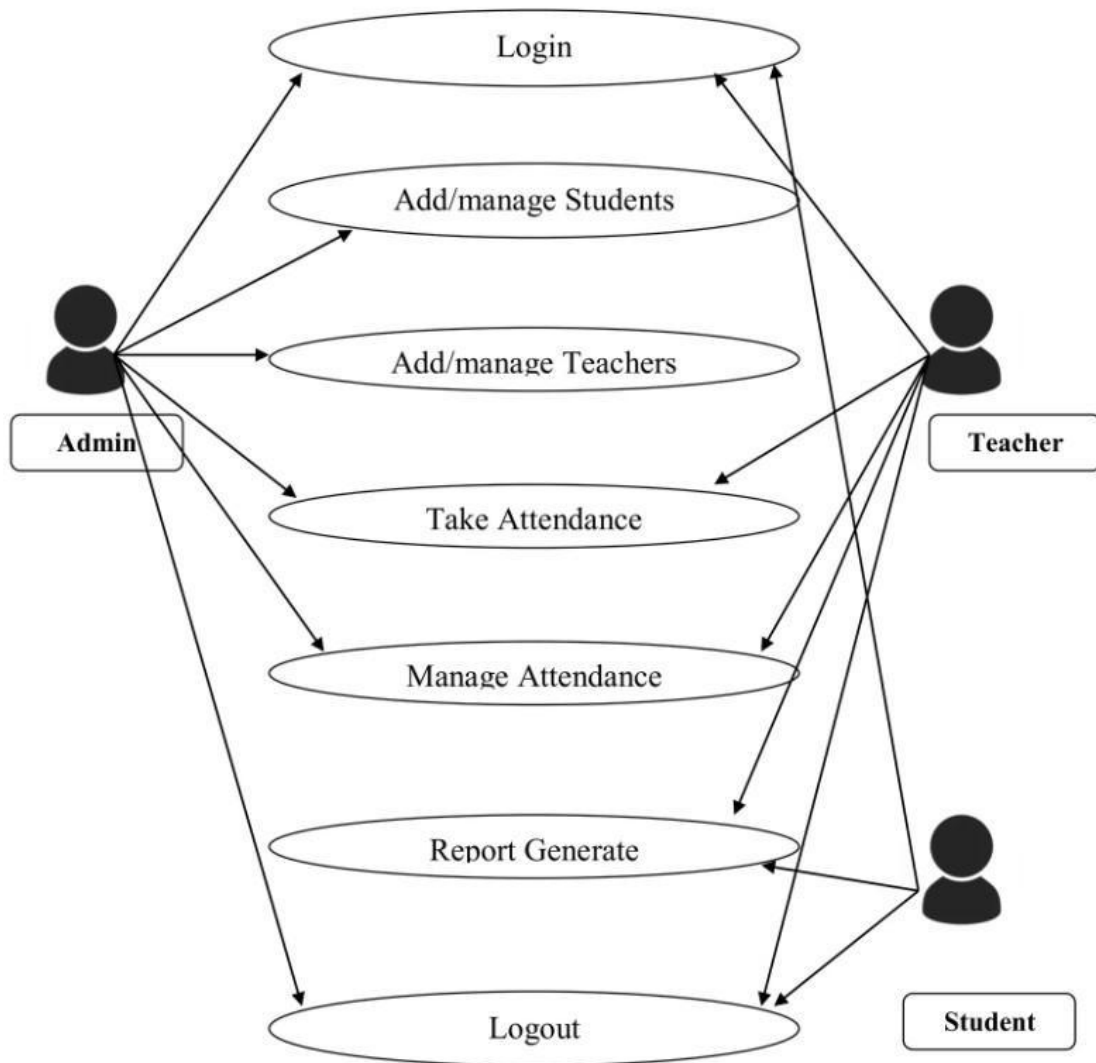


fig 3.3

3.4. Data Flow

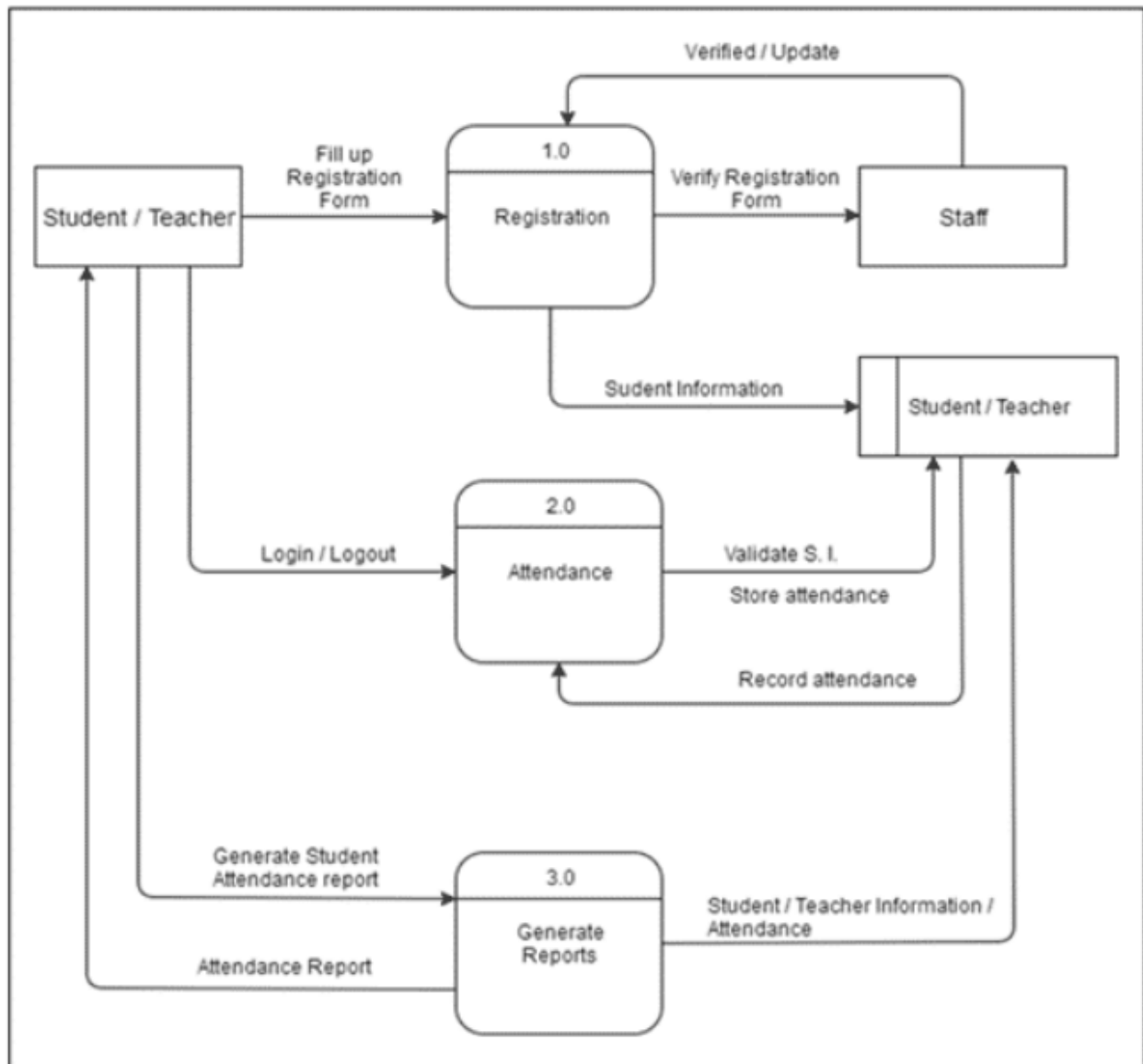


fig 3.4

3.5. Design selection

Analyze the above designs and select the best design based on comparison and reason.

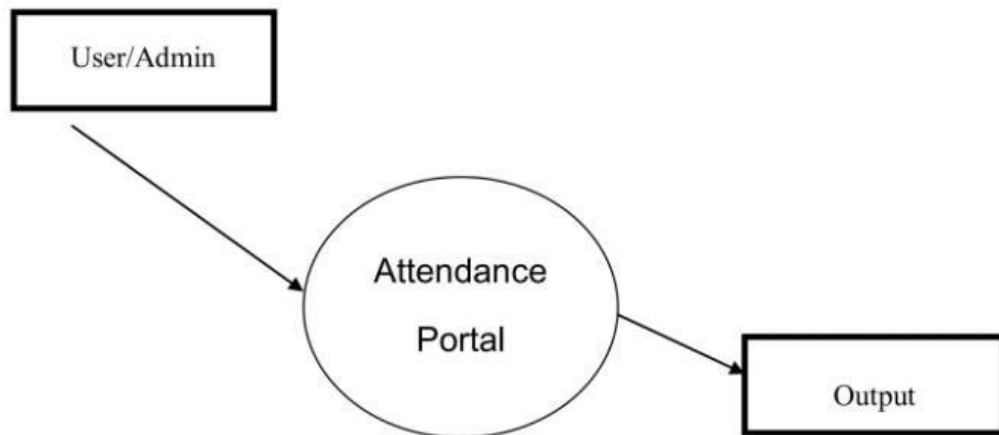


fig 3.5.1

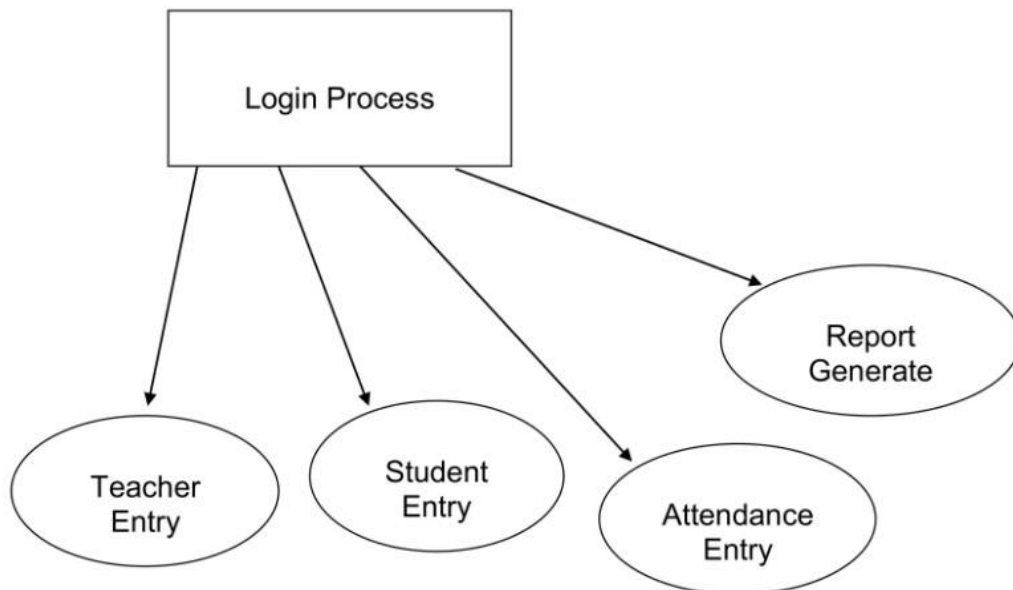


fig 3.5.2

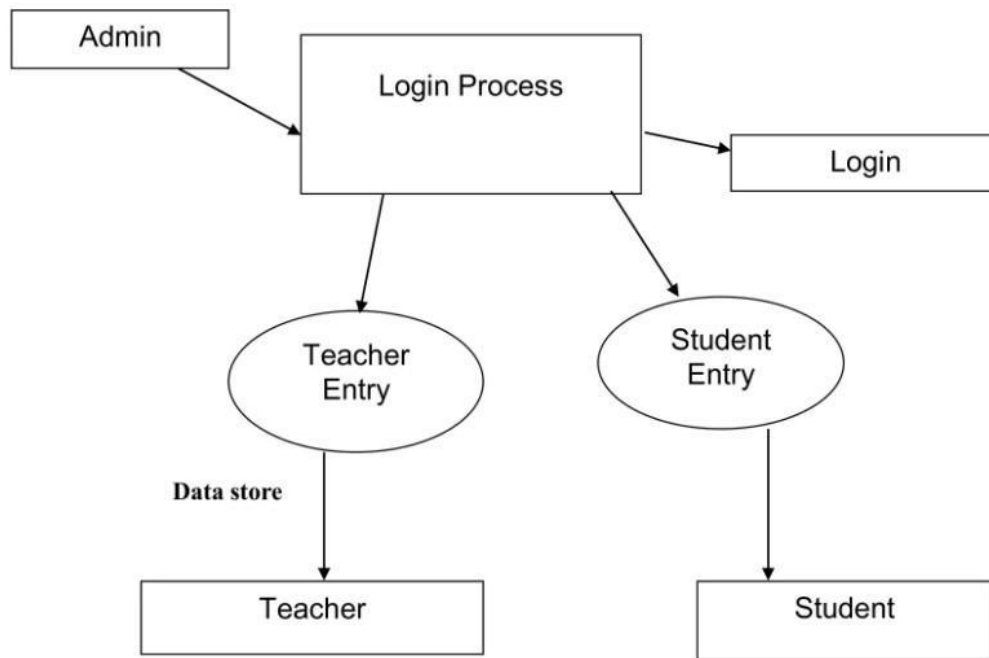


fig 3.5.3

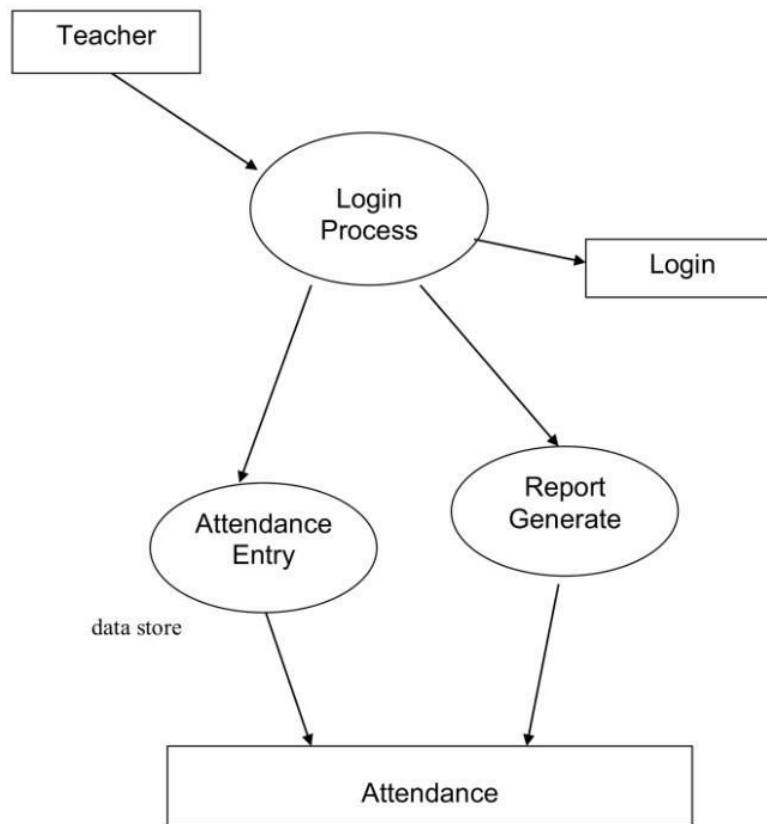


fig 3.6.4



fig 3.5.5

3.6. Implementation plan/methodology

3.6.1 : Attendance Management System Methodology

This chapter discussed the methods used in the collection and analyses of data. The methodology focuses on the experiences of people involved and attempts to understand the reasons behind certain behavior descriptions. The evaluation was carried out using data collection techniques and interviews.

3.6.2 : Planning

This part is the initiation part where the research study was started. In planning, we start in searching where we conduct our study and we decide to conduct our study. We plan on how to collect data and how to organize our time in conducting a research interview. Organized the members of their individual roles and obligations in conducting the study. In planning, it includes analyzing, designing, software development, testing, and implementation.

3.6.3 : Analyzing

This is where we collected the needed data for the research. The part of the interview was to know what was being used in their current system and we noticed that the transactions were manually operated in the school. After gathering the data and analyzing the problem according to their existing system, we analyzed how to give a concrete solution to those problems and based on the problem.

3.6.4 : Designing

Designing is based on users and client roles. This stage is creating a design for the system. It includes a student registration form, teacher's registration form, reports, attendance transaction, and student and teacher's information management. The system is designed as a user-friendly system.

3.6.5 : Software Development

1. Coding

In the development of the system, we made use of Microsoft Visual Basic Studio 2010 for encoding the source code of the system, in order to be accurate and fast acquisition of data and information.

2. Testing

After finishing the main parts of the transaction of the system, the proponents gave a test sample to the client and there is a lot of learning they encountered, it made them know the minor and major mistakes in the system and it gave the researchers more understanding on how to develop it.

3.6.6 : Implementation

The Project is loaded in Visual Studio 2010. We used Visual Studio for Design and coding of projects. Created and maintained all databases into SQL Server 2008, in that we create tables, write query for store data or record of project.

Documents were compiled for final output to be submitted to the client. This includes the documentation and software. Giving some user orientation or tutorials on how to use the system is held at this stage.

Hardware Requirement:

- i3 Processor Based Computer or higher
- Memory: 1 GB RAM
- Hard Drive: 50 GB
- Monitor
- Internet Connection

Software Requirement:

- Windows 7 or higher
- Visual studio 2010.
- SQL Server 2008.

3.6.7 : Attendance Management System Constraints

The lists below are some constraints that may be encountered during the operation.

- **Natural Disaster** – can naturally interrupt any operation in the school such as floods, earthquakes, and typhoons.
- **Hardware** – in some cases like unexpected brownouts, using computerized transactions is unavailable and sometimes the hardware components of the computer like power supply, motherboard, and hard drive could be affected by the improper shutdown of the computer due to unexpected brownouts that will cause computer malfunctions. Improper use of the computer may also cause hardware problems.
- **Software** – computer virus is the most common problem in software functionalities. This is done by downloading from the internet like images, music, videos that are not necessary to the system. File sharing from infected USB pen drives could spread the virus to the computer system.

3.6.8 : Softwares Utilized:

Application

Language used: Python

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages.

- Python is Interpreted – Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.
- Python is Interactive – You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.
- Python is Object-Oriented – Python supports Object-Oriented style or technique of programming that encapsulates code within objects.
- Python is a Beginner's Language – Python is a great language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

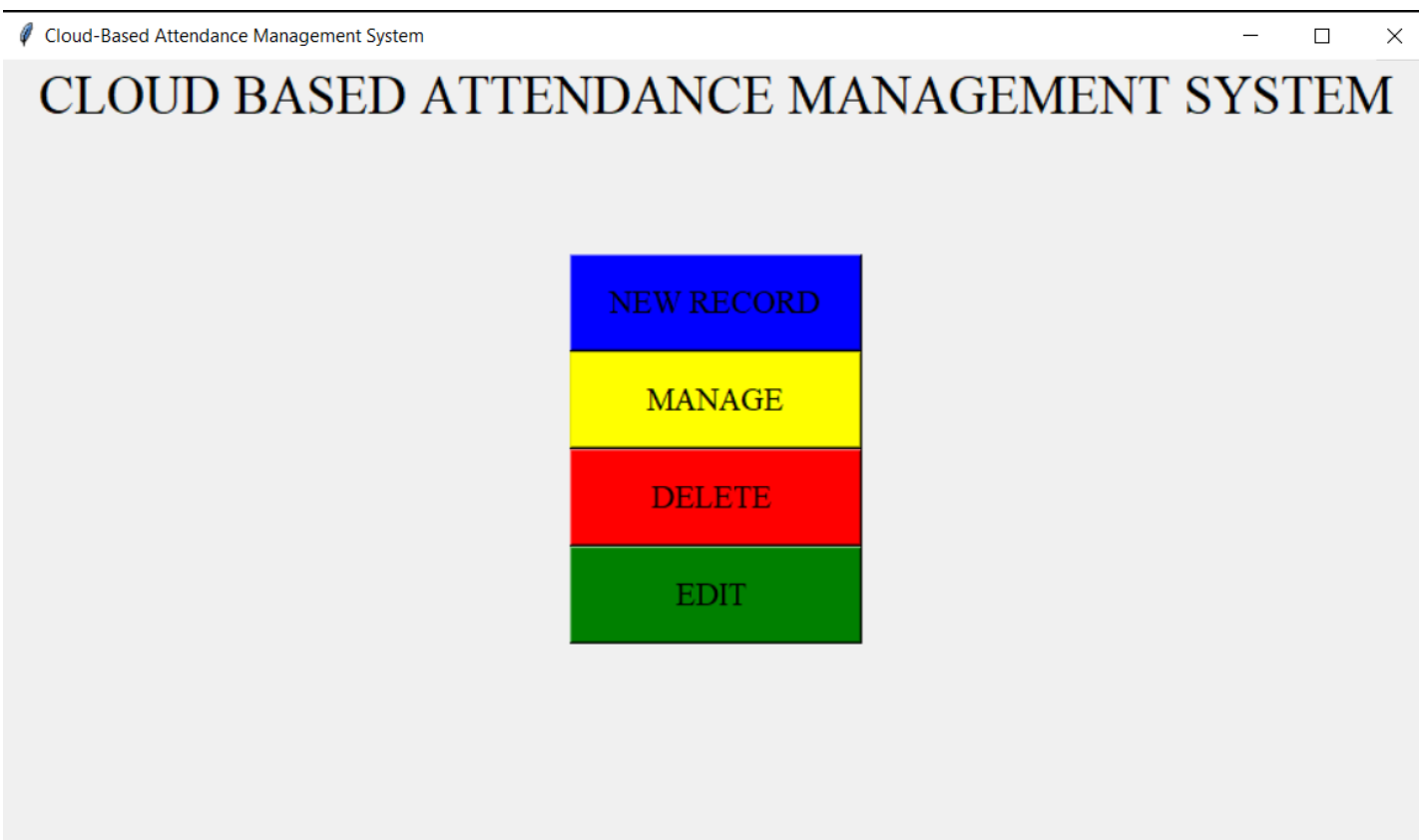


fig 3.6.8.1 : Home Page

New Record : To insert a new record of courses

Manage : To manage the attendance record

Delete : To delete the inserted attendance record

Edit : To edit or update the attendance record

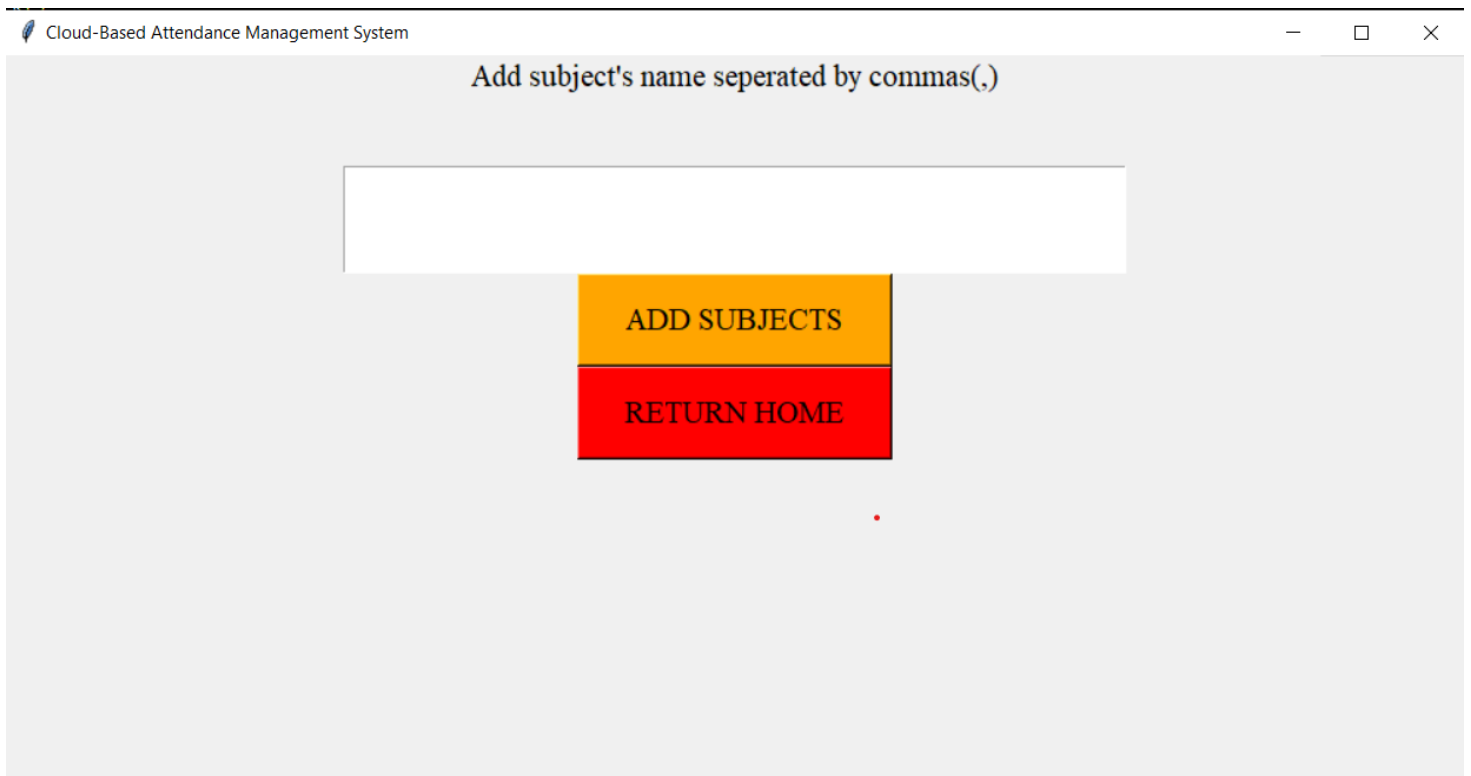


fig 3.6.8.2 : Add Courses Page

Dialogue Box : Enter the name of courses in the box to add

Add Subjects Button : To add the subjects and assign the subject code

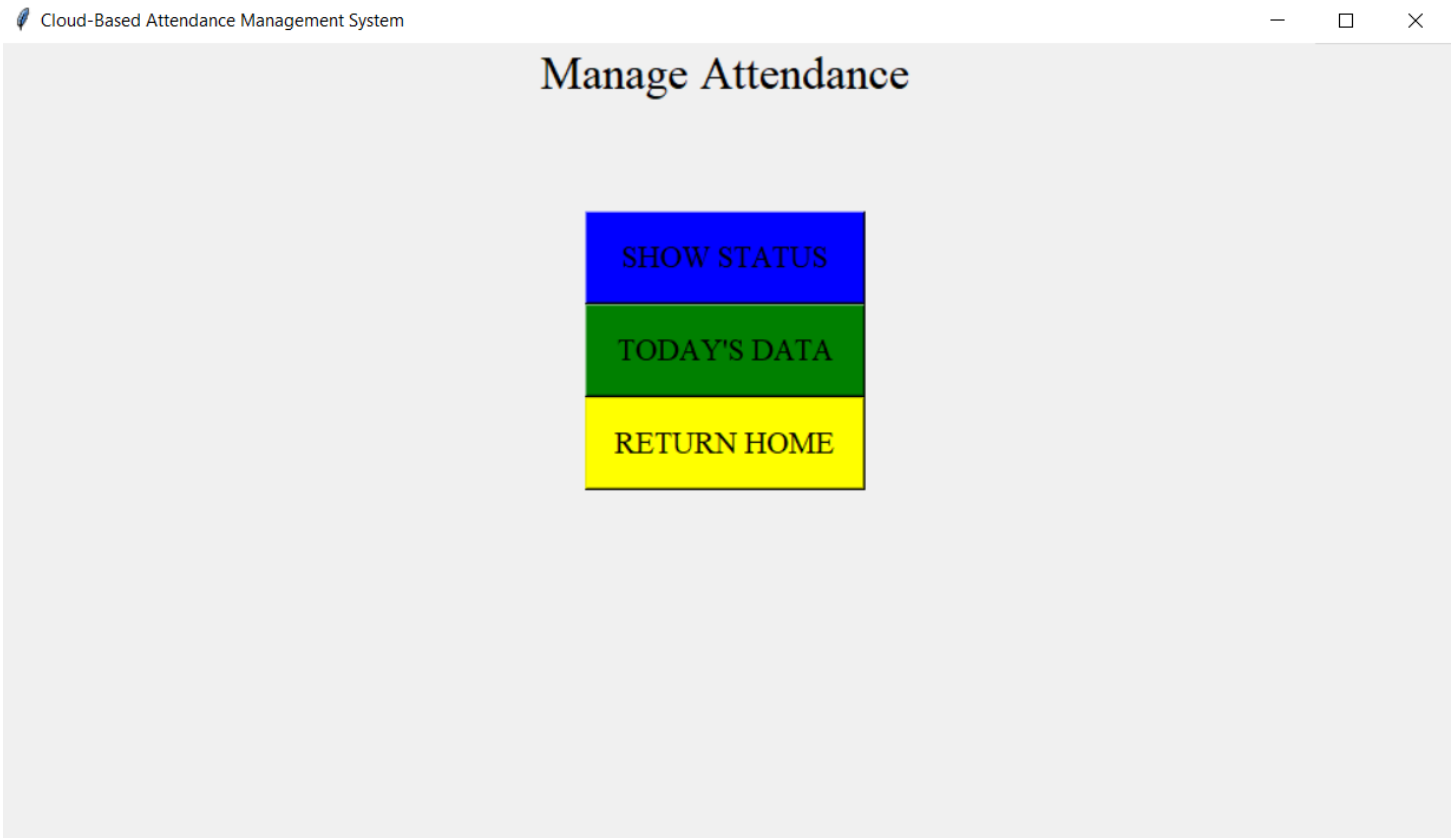


fig 3.6.8.3 : Manage Attendance Page

Show Status : To show attendance record along with the subject code

Today's data : To insert today's attendance in record

Return Home : To return back to home page



fig 3.6.8.4 : Delete Attendance Record Page

Yes Button : To confirm the deletion of the attendance data

No Button : To cancel the deletion of the attendance data

Return Home : To return back to home page

Cloud-Based Attendance Management System

EDIT RECORD

Enter Subject Code

Total Present

Total Absent

SHOW SUBJECT

UPDATE

RETURN HOME

fig 3.6.8.5 : Edit Attendance Record Page

Show Subject : To see the subject code fromm the courses available

Update : To update/modify/rectify the attendance log

Return Home : To return back to home page

Database: Sqlite3

SQLite is a C library that provides a lightweight disk-based database that doesn't require a separate server process and allows accessing the database using a nonstandard variant of the SQL query language. Some applications can use SQLite for internal data storage. It's also possible to prototype an application using SQLite and then port the code to a larger database such as PostgreSQL or Oracle.

The sqlite3 module was written by Gerhard Häring. It provides an SQL interface compliant with the DB-API 2.0 specification described by PEP 249, and requires SQLite 3.7.15 or newer.

Attendance Table

FIELDS	DATATYPE	CONSTRAINTS	DESCRIPTION
Dates	Date	Primarykey	Enter day by day attendance
Hour	Number	primarykey	Set particular hour only
Subject	Varchar(15)	NotNull	Particular Subject
Rollno (1 to 60)	Varcabar(20)	NotNull	Enter Present absent details in particular student(ex:M11MCA001)

Table 3.6

Deployment: AWS EFS

Amazon Elastic File System (Amazon EFS) automatically grows and shrinks as you add and remove files with no need for management or provisioning. Amazon Elastic File System (Amazon EFS) provides a simple, serverless, set-and-forget elastic file system for use with AWS Cloud services and on-premises resources. It is built to scale on demand to petabytes without disrupting applications, growing and shrinking automatically as you add and remove files, eliminating the need to provision and manage capacity to accommodate growth. Amazon EFS has a simple web services interface that allows you to create and configure file systems quickly and easily. The service manages all the file storage infrastructure for you, meaning that you can avoid the complexity of deploying, patching, and maintaining complex file system configurations.

AWS automatically deploys and manages the infrastructure for Elastic File System (EFS), which is distributed across an unlimited number of servers to avoid performance bottlenecks.

The service includes file system access facilities, such as data consistency and file locks. An administrator controls access to the service through AWS Identity and Access Management roles and limits network access through Amazon Virtual Private Cloud (VPC) security groups.

Amazon EFS includes the following features:

- **Storage options** : Amazon EFS offers two storage classes for files -- Standard and One Zone. Both classes are designed to handle the most frequently and least frequently accessed data. With EFS Lifecycle Management, an organization can reduce costs by enabling the automatic transfer of infrequently accessed files from Standard storage to either EFS Standard-Infrequent Access or EFS One Zone-Infrequent Access.
- **Scalable performance** : Amazon EFS can provide the throughput, IOPS (input/output per second) and low latency to support a variety of workloads. It is designed to make file storage and access scalable, while minimizing time spent on administration.
- **Secure and compliant** : Amazon Virtual Private Cloud is a secure, managed cloud environment that runs applications inside AWS and controls virtual network access to file systems. Amazon VPC enables developers to create VPCs that are fully isolated from other VPCs in AWS. This provides control over AWS networking, including the selection of IP address range, creation of subnets and configuration of route tables and network gateways. Additionally, application access can be controlled with AWS Identity and Access Management (IAM), which is a set of services for managing AWS users, groups, roles and policies. It provides a centralized service, which can be used to control access to AWS resources, as well as monitor which users are accessing particular resources.



fig 3.6.8.6 : Amazon EFS

CHAPTER 4.

CONCLUSION AND FUTURE WORK

4.1. Conclusion:

- The system can be used for schools, colleges, or universities for taking down attendance.
- The system can be used during parents meeting to show parents about their children's attendance performance.
- It can also be implemented in organizations for attendance.
- It maintains the records in a large database instead of the conventional method of maintaining a register which further simplifies the process of searching for a particular record.
- Admin may easily get the attendance history of a particular student.
- The system introduces a manageable and systematic approach to maintain attendance records.
- No proxy attendance will be entertained.
- It saves user time, cost and institute resources.
- Records can be easily accessed and stored and other information respectively.
- Maintaining the all secured and database on the server which will be accessible according to the user requirement without any maintenance cost will be very efficient as compared to storing all the customer data on the spreadsheet or physically in the record books.
- Cloud Based Attendance System is design as an easy way. So maintenance is also easy.

4.2. Future work:

The project has a very vast scope in future. The project can be implemented on intranet in future. Project can be updated in near future as and when requirement for the same arises, as it is very flexible in terms of expansion. With the proposed software of database Space Manager ready and fully functional the client is now able to manage and hence run the entire work in a much better, accurate and error free manner. The following are the future scope for the project.

- Discontinuation of particular students eliminates potential attendance.
- Bar code Reader based attendance system.
- Facial Recognition Based attendance system.
- Individual Attendance system With photo using Student login

CHAPTER 5

USER MANUAL

Home Page:

This will be the landing page when you open the application.

You select from the features below:

1. New Record.
2. Manage Record.
3. Delete Record.
4. Edit Record.

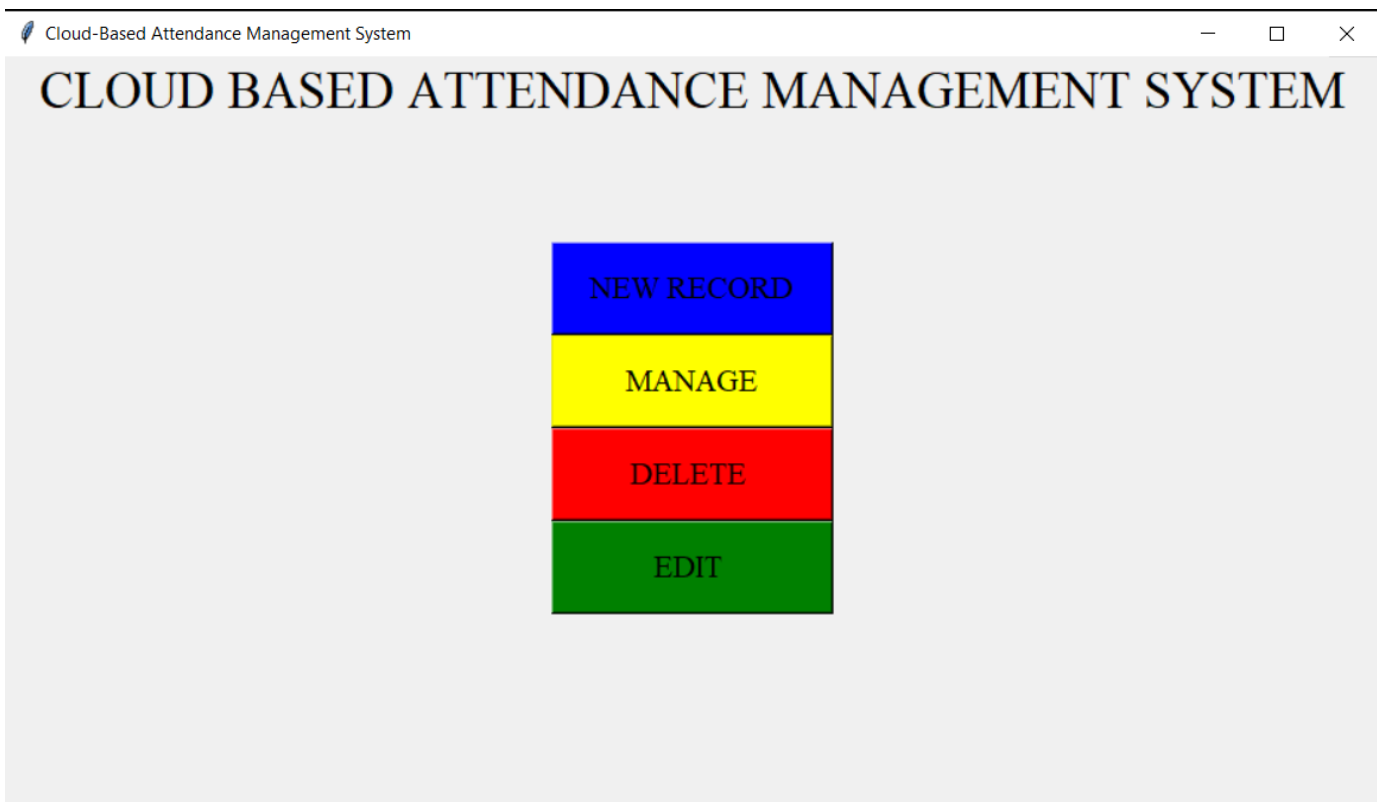


fig 5.1

New Record:

Here you can add required subjects for attendance.

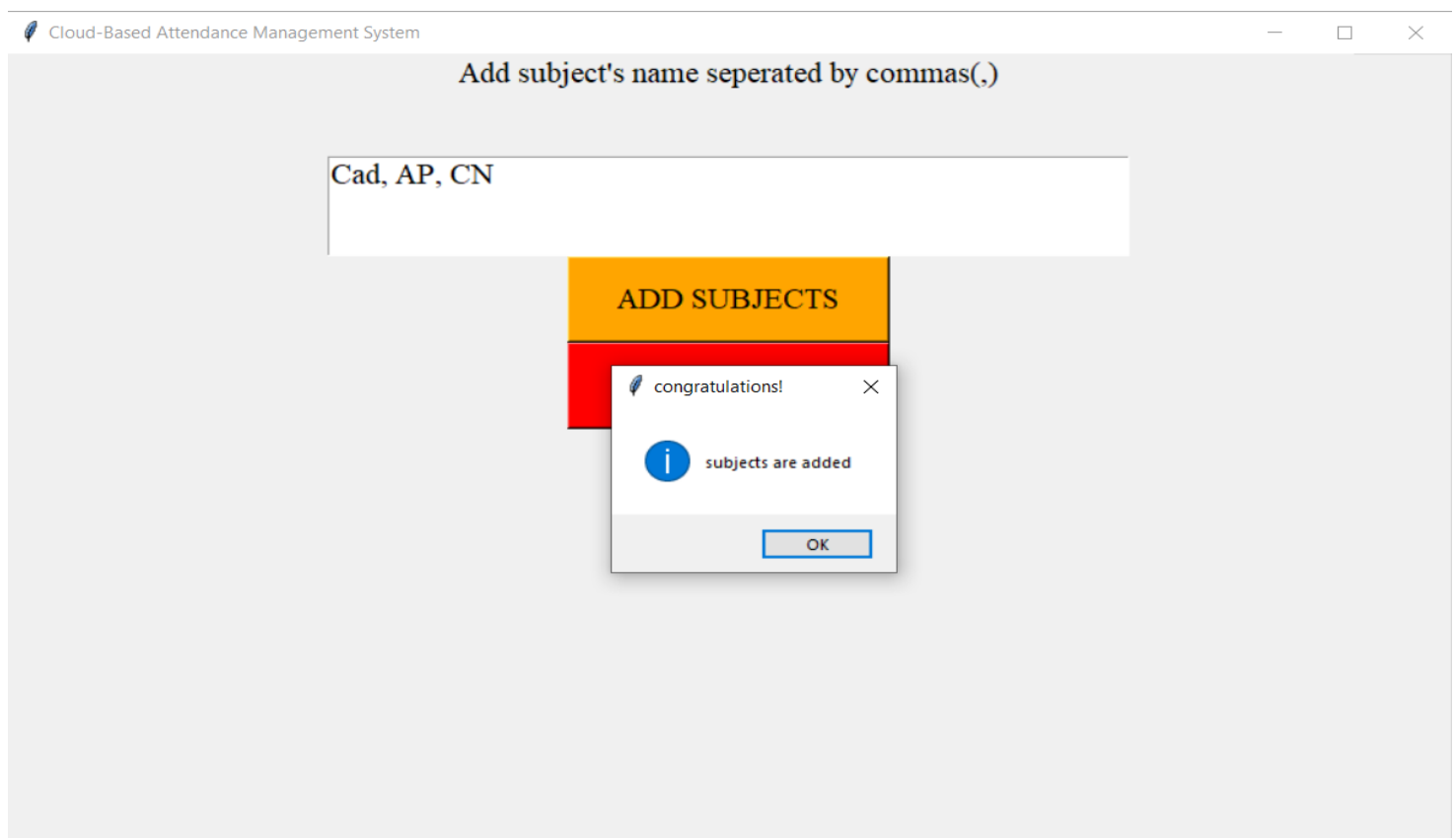


fig 5.2

Manage Attendance:

Here you can manage and see attendance records for every subject.

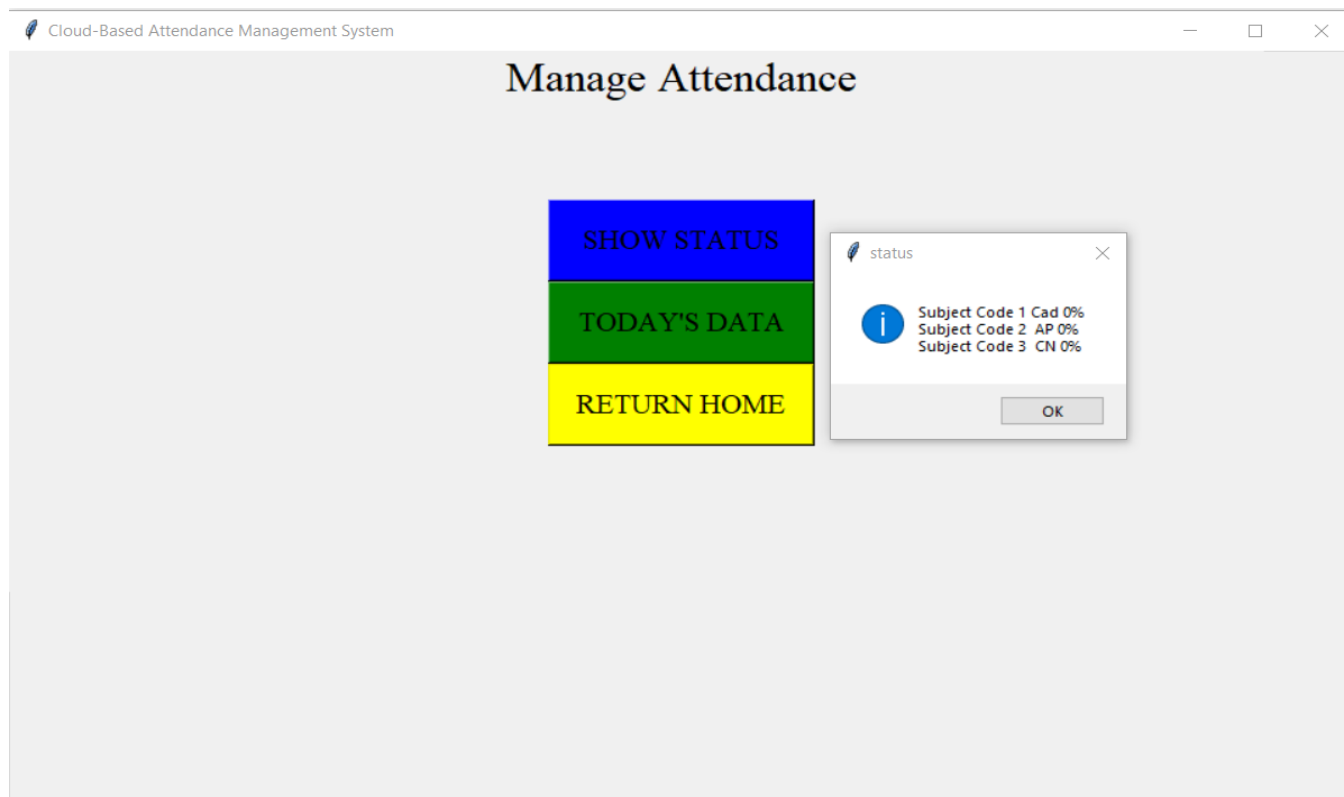
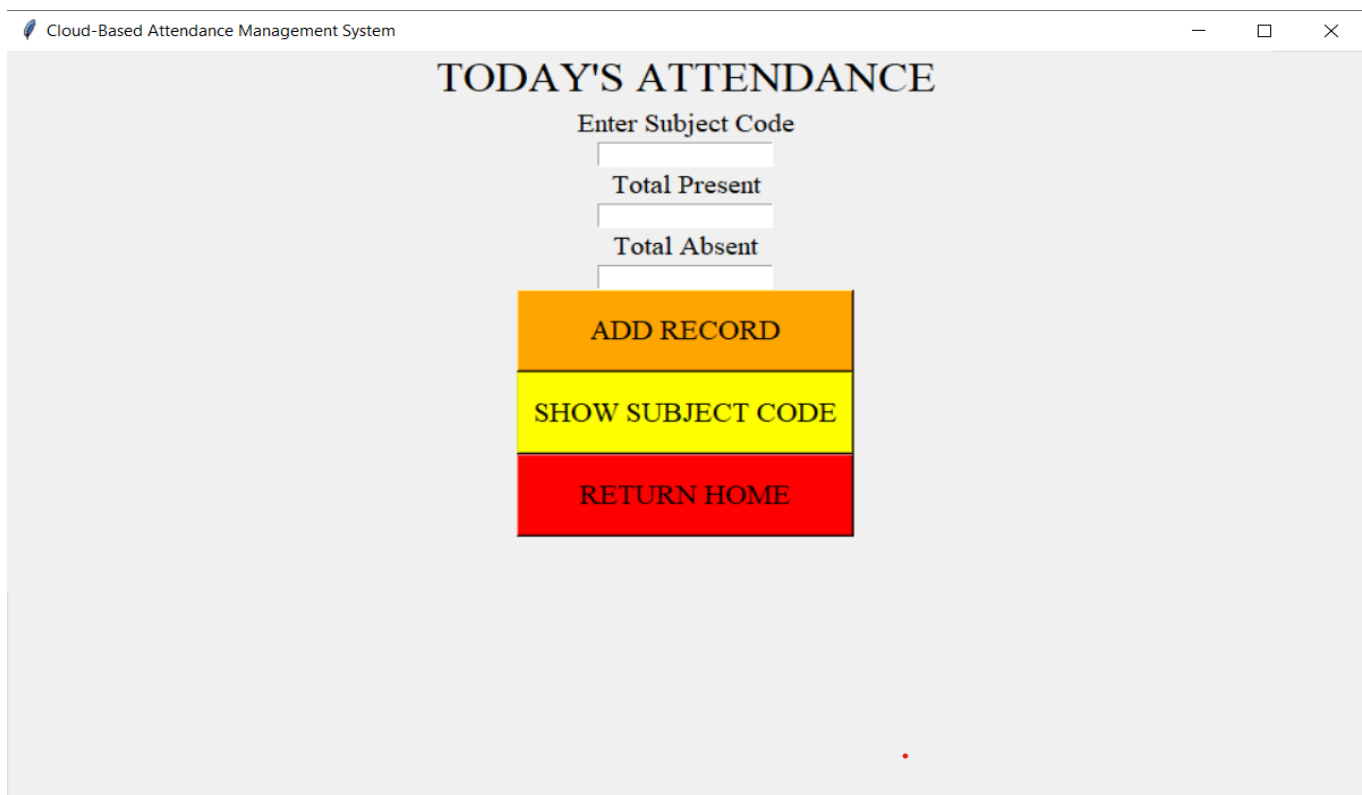


fig 5.3

Add Record:

Here you can add a new attendance record for every subject for the day.



The screenshot shows a web browser window titled "Cloud-Based Attendance Management System". The main heading is "TODAY'S ATTENDANCE". Below the heading, there is a form with the following elements:

- A label "Enter Subject Code" above a text input field.
- A label "Total Present" above a text input field.
- A label "Total Absent" above a text input field.
- A yellow button labeled "ADD RECORD".
- A green button labeled "SHOW SUBJECT CODE".
- A red button labeled "RETURN HOME".

The form is centered on a light gray background. There is a small red dot in the bottom right corner of the form area.

fig 5.4

Edit Record:

Here you can edit existing records for past attendance for discrepancies.

Cloud-Based Attendance Management System

EDIT RECORD

Enter Subject Code
1

Total Present
22

Total Absent
20

SHOW SUBJECT

UPDATE

RETURN HOME

Alert! Updated

OK

fig 5.5

Delete Record:

Here you can delete existing records taken.

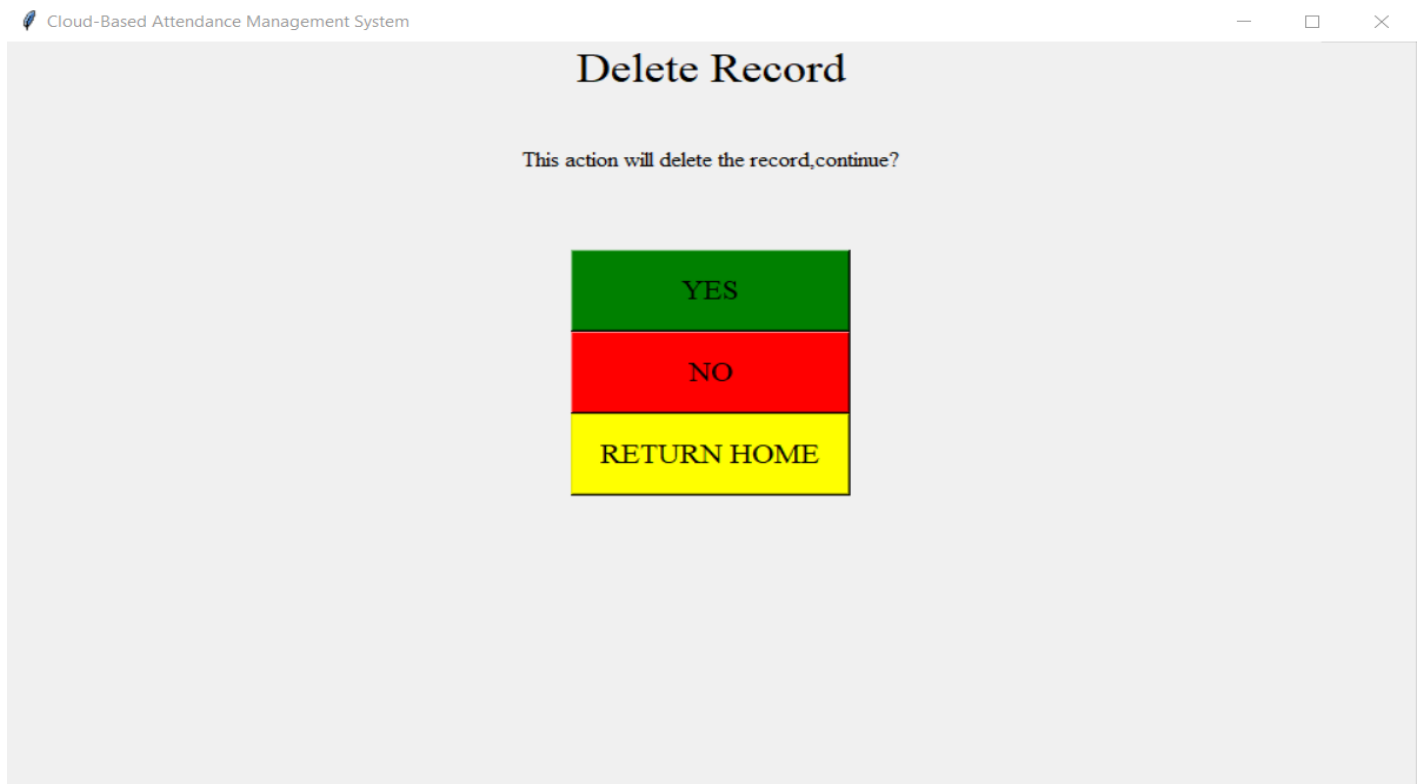


fig 5.6



fig 5.7

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