Analysis

Proposed solution:

Initially, Mr. Atul and I took into consideration these three solutions:

A Google Spreadsheet.

A Database.

A Visual Basic Form.

After the consultation, we agreed upon creating a database as the solution which is accompanied with a Visual Basic Program to get input from the user.

Requirement specification

IT system requirements

Hardware: A normal personal computer with fundamental or basic requirements (1GHz processor, 512 MB RAM, 10 GB HD, Screen, Keyboard, Mouse). A printer of any kind to print out the documents (it is preferred to have a laser jet printer for time efficiency and quality).

Software: Windows XP or greater along with Microsoft Office Package 2003 or greater. Microsoft Office Package must include Microsoft Visual Basic 2003 or greater and Microsoft Access 2003 or greater. Additionally, a web browser such as Google Chrome or Mozilla Firefox is also required to run the web application. Note that the web browser must be compatible with and updated to the latest Java Applet to run the web application.

System interaction

The user and administrator must have all the required software installed in the PC. Additionally, when specific data is submitted from the web application on the server, the data should be sent to the database and should be stored into tables.

The user prints out certain documents which are then sent to the printer resulting into a hardcopy of the attendance records.

Input/output requirements

Input requirements

Following details are required to be inputted into the database:

- Student First Name.
- Student Last Name.
- Grade in which the student is studying in.
- Class Teacher Name.

Following details will be inputted by the user or the teacher taking the attendance (information inputted in the Visual Basic form):

- Teacher Username.
- Teacher Password.
- Date of Attendance.
- Attendance of each student (Present, Absent, Tardy).
- A note or a comment on the student's attendance.

Output requirements

Databases with the following tables:

- Teacher Name/Username.
- Class/Grade.
- Student Marked Attendance.
- Attendance Date.

The following queries can be performed in the database. The administrator will be able to see the following details in the database:

Marked Attendance filtered by:

- Student name.
- Term.
- Class.
- A Custom Start Date to End Date Attendance.

After this, the administrator can print out the attendance records by clicking on the print icon. The administrator has several options to print out the attendance. The following can be printed out. (The attendance records will consist of days attended over total school days).

- Attendance records from a particular starting date to end date entered by the administrator.
- Attendance records based on a selected class.
- Attendance records based on a particular student selected.

Processing

The attendance taking application will be a Visual Basic file which is exported onto an HTML website for access to everyone on the server.

First, the user or the teacher in this case needs to put in their designated username and password to sign into their account.

Now, the teacher needs to click on one of their active classes to begin the process of taking attendance. The date also needs to be selected for which the attendance is being taken.

Once this is done, the name of the students enrolled in the designated class will show up.

By default, each of the students will be marked as present. Next to each student's names, there will be a dropdown list from which the teacher can change the attendance of the student.

Once the teacher is done marking the attendance, the submit button can be clicked to finish the process.

All of this information is now saved to a database where the administrator can check for attendance records for a particular student, class, time period.

The administrator also has the option to print out the attendance records which can be done by clicking on the button.

Security

Passwords: Highly encrypted passwords which are used to sign into the teacher's account to take the attendance. The same is also used for the database and a password which grants the administrator to view the database.

IP Addresses: Each time the data is entered by the user or the teacher, the IP address is also reported to the administrator so that there is no confusion and risks of hacking.

iCloud Storage: The details or information in the database is also saved in the iCloud Database to make sure that even if the system crashes, the data still exists and is not erased.

Specific performance criteria

The following factors must be included and should be taken into account for the final product:

The teacher, user, or administrator is able to successfully able to sign in to their account with their respective usernames and password.

All the events coded are working properly and for each event taking place, there is an action. These events include:

Clicking on the Print Button results into the specific job printed on a piece of paper.

Clicking on the Submit Button results into submitting the input from the user and organising the data into tables in database.

Clicking on the DropDown Menu results into different choices provided to the user that can be made (i.e.: Choosing a date, changing the attendance marked by default, choosing a grade level, choosing a student…)

All the computed calculations and formulae involved are working properly resulting into correct mathematical answers (i.e.: counting total number of days, calculating the average class attendance, calculating total number of days attended).

The administrator is able to perform queries of any kind in the databases such as searching the attendance for different grade levels, students, or advisor.

The administrator is able to access and edit different tables and forms (i.e.: teacher profile form, student profile form).

The administrator is able to view the teacher or user who has submitted the attendance.

Navigation to different tables and forms in the database is easy, it is structured ina logical manner and clicking each one of the forms leads to the correct database entry.

Justification of chosen solution

From the initial consultation with the client Mr. Atul, it was clearly identified that the problem of the client was that there are no attendance taking systems and the school only relies on a Google Spreadsheet to keep records of each student's attendance.

It can be clearly seen that choosing a spreadsheet as the solution won't really help the school as they are currently using it as an option. Also in any case, this system won't help the teachers or school in the long term because there will be many students joining the school and just taking attendance twice on paper as well as on the spreadsheet will not be time effective.

The best solution in this case would involve an integration of a Visual Basic Form Application and a database. The Visual Basic Form will be loaded on the school's server which will allow all the teachers on the server to take attendance easily. One of the main parts of the solution also includes the database. Once the teachers take attendance on the VB program, the data is submitted in a database where administrators can perform queries and print out attendance records by grade level, student, or advisor teacher. On top of the attendance records, the database will also have forms including student profile and teacher profile. This would help the administrator in looking up certain contact information for a student if they are absent on a particular day. This sort of information would also be easy to navigate and would help in finding contact information easily. Additionally, since the school is "Google-friendly", it would be better to create an online Google Database where the same information is stored but it is rather online. So, even if the system crashes and the hard disk is damaged, then the records are not lost because all of it is on the iCloud.