# Software Requirements Specification

**for**

# <School-Attendance-System>

**Version 1.0 approved**

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**<8th November, 2020>**

# Table of Contents

# Revision History

| Name | Date | Reason For Changes | Version |
|---|---|---|---|
| SAS team | 2020/11/14 | Implementing changes after first review | V1.0 |
| | | | |

# 1. Introduction

## 1.1 Purpose

The purpose of this document is to give a detailed breakdown of the requirements for the School Attendance System project and how it satisfies the needs of all the stakeholders involved. This system-to-be is primarily going to track attendance across multiple classes and across multiple schools under the school district.
This document is primarily intended to be proposed to the stakeholders for its approval and a reference for developing the first version of the system for the development team. It will cover the purpose, use, system features, common usage cases, external, functional and nonfunctional requirements.

## 1.2 Document Conventions

The document doesn't follow a strict convention but please take a very quick look at the Glossary section in Appendix A before starting, to recognize some of the various terms that are being used interchangeably throughout this document

## 1.3 Intended Audience and Reading Suggestions

The intended audience of the system will be:

- Teachers (Regular & Supply) who are going to be using this system to track attendance
- School Secretaries who are going to be using the system to keep attendance records and send notifications to parents of children who were absent or late on a particular day
- Parents who have children enrolled in a school that uses this system
- Developers can use this document to evaluate the project and gain further insight into where future improvements and features could be added.

The rest of the SRS (Software Requirement Specification) document is organized nicely and you would have no trouble going through all the subtopics sequentially, but you can always jump towards a section that you would like to specifically read.

## 1.4 Product Scope

The purpose of the Student Attendance System is to provide a simple way of tracking attendance of approximately ~150,000 students across ~150 schools and eliminate the inevitable human errors of undertaking such a task manually. This is paramount because the funding of these schools are directly tied with the attendance of the students in them and the system needs to make sure it tracks attendance accurately. This will save enormous amounts of time by not needing to go through piles of attendance records and so more time can be diverted towards other more important admin related tasks.
The SAS need not be complicated for the main intended audience to use as to minimize the time it takes for it to adopt this system and replace the older one while also minimizing training costs.

## 1.5 References

The entire project and all the relevant materials can be found on this GitHub link:
https://github.com/Nasiff/School-Attendance-System

# 2. Overall Description

## 2.1 Product Perspective

This product is a solution to the human error problem with the school attendance system when reporting false absences. For the current system (the system-as-is), the teacher would call out the students' names and record them as present, late, or absent. After a certain amount of time determined by the teacher, the attendance sheet is sent with a student and is collected by the secretary. The secretary is supposed to check each attendance sheet and make phone calls and send emails to the parents of the students that were missing. Due to the heavy volume of paperwork, the staff often misses some students by mistake. If the absence was recorded by the parents prior to the deadline, the secretary will take no action due to the absence or lateness.

The goal of this product is to replace this system with a website such that all users such as the parents, teachers, and secretaries can interact with it in the manner that they are meant to. The website will be directly related to a database server that will hold all attendance records and can login administrative staff for whichever school they belong to in the district. It can provide a means of usability and easiness for the parent such that they can login and check the attendance record of their children. This is also meant to reduce the task load of the secretaries and divert their time to the more important admin tasks.

The overall concept of this website is to minimize the complexity of utilization and this will help minimize the time it takes to train administrative staff while maximizing the usage and minimizing the human errors.

## 2.2 Product Functions

Parents:

- Login to the SAS using the Parent Login
- View each of their children's attendance for a given day (and from any given school if the parent's children are in different schools under the same district)
- Mention ahead of time if a particular child is going to be late or absent in a future date
- Get notifications through the system

Teachers:

- Login to the SAS using the Staff Login
- Select the school to mark the attendance for, on a particular day (if teacher is teaching at multiple schools)
- Mark attendance for each student for a particular day and send it to admin

Supply Teachers:

- Inherits all the responsibilities of a teacher
- Loses access to the system at the end of a day

Secretaries:

- Login to the SAS using the Staff Login
- Generates/Provides unique ID and password for Parents, Teachers & Supply Teachers
- Edits attendance records for specific circumstances (See Section 2.3)
- Uses the system to send notifications to the parent of the children who are late or absent

## 2.3 User Classes and Characteristics

Two of the most important user classes would be the parent and the teacher due to the number of requirements and abilities that these user classes may carry out when dealing with the product. Some of the lesser user classes would be the secretary and the supply teacher due to lower amount of requirements they have or that they may have similar requirements to more important classes so it allows for reuse in requirements and implementation.

**Parents:** receive on-site notifications from the secretary as well as choosing how to receive secondary notifications such as automated phone messages or emails. The parents have a specific sign in where they provide the system with an email address and a password to login to the system. There is also the issue of making sure that the parent logging in or signing up must also be verified, so verification can be through putting in their children's full name and student number so there is confirmation.

**Teachers:** have the same level of importance dealing with their requirements such as logging in using an Unique ID and password. They must also carry out the task of filling out the attendance and checking that every student is present by checking the green box, they must check the red box if the student is absent, or the yellow box, if the student is late. They take attendance for each of the classes they teach.

**Supply Teachers:** do everything a teacher does but only does so for a limited amount of time. They have a unique id number and password that is provided by the administrative staff which expires at the end of the school day.

**Secretary:** looks through the absences and late students and makes sure to contact each and every parent of the corresponding student. The secretary can edit one of the attendance records if a student does come late through the office and signs in and may also decide to mark a student as absent if the student had to be somewhere else for emergency purposes but was marked as present at the start of the day. Although most of the time, the secretary will check and send notifications easily with the help of the in-built notification system that can be integrated with phone and email. The secretary is also able to generate logins for both Supply and Non-supply teachers and for other (new) secretaries. But the secretary has to verify the Parent in-person and identification for them to generate a new account for parents.

## 2.4 Operating Environment

First and foremost, it must be imperative that this software work with Windows OS, Mac OS, and Linux distributions in the background as they are most common in the working environment. However, Windows OS is the most utilized operating system in the industry, especially in the school environment due to its robustness and simplicity.

This website should be accessible through web browsers such as but not limited to Internet Explorer, Google Chrome, Mozilla Firefox. The reason for this may be due to the limited RAM constraints for different computers particularly for users who don't have access to more higher-end devices to access the website. The website should easily be accessible through simply entering the website in the URL section or by searching it using various search engines such as Google, Bing, DuckDuckGo, etc.

## 2.5 Design and Implementation Constraints

- See Section 2.7 for some of the assumptions that were made when writing this document.
- See Section 6.1 for constraints on the database.
- See Section 5 for more Non-Functional constraints that need to be taken into consideration.
- For the majority of the features and deliverables they're going to be dependent on the deadline which is stated to be the 5th of December. This may prove to be difficult and if it doesn't get delivered on time, then at least the basic functionality that covers the main users of the system will be good enough for a first version of the system. In the future versions, more features will be added and any common bugs that affect user flow will be fixed. (See Section 3 for more info)

## 2.6 User Documentation

For using this website, there should be private YouTube tutorials on how to do certain things pertaining to each user class which should be concise and easily understandable. Another thing that can be added to the website is a help section where it displays the table of contents on certain functions and abilities pertaining to each user class and explains how to do certain tasks if there is any confusion. YouTube tutorials can be integrated into this due to visual learning being very effective for a lot of users and there should also be an FAQ section just in case anyone has any questions that are commonly asked. If there are uncommon questions, then the user can email for assistance if there are any problems with the website so there can be fixtures and add-ons.
But for the first version of the system a basic User Manual needs to be provided for each user class and how they could use the system and the common system flows they will find themselves in.

## 2.7 Assumptions and Dependencies

- The Web browser used to access this system will have the latest stable version
- The Web browser will have cookies and Javascript enabled for an optimal experience
- The Operating System that will have the Web browser is of the latest stable version
- Parents User classes are already going to have the necessary details of themselves and their Children in the main school records/system. This is the same for the Teachers and Supply Teachers themselves. This is what is going to be used by the administration to verify and validate users before giving them access to the SAS.
- There are four periods on any given class day.
- Phone calls are automated and the secretary doesn't physically get on the call.
- All access codes are generated by the secretary.

# 3. External Interface Requirements

## 3.1 User Interfaces

The school board will have one unified website which will allow all users to interact with it. Specifically, it will have a login section for parents, administration, teachers and supply teachers. Parents will be able to login and look at their child or children's attendance on the website. The navigation bar on top with "Home, Parents, Students,..., etc.," "News and Links" to the left, and "Spotlight and Events" are just a placeholder and are not indicative of what the website will look like. The main point to focus here are the 2 logins for staff and parents.

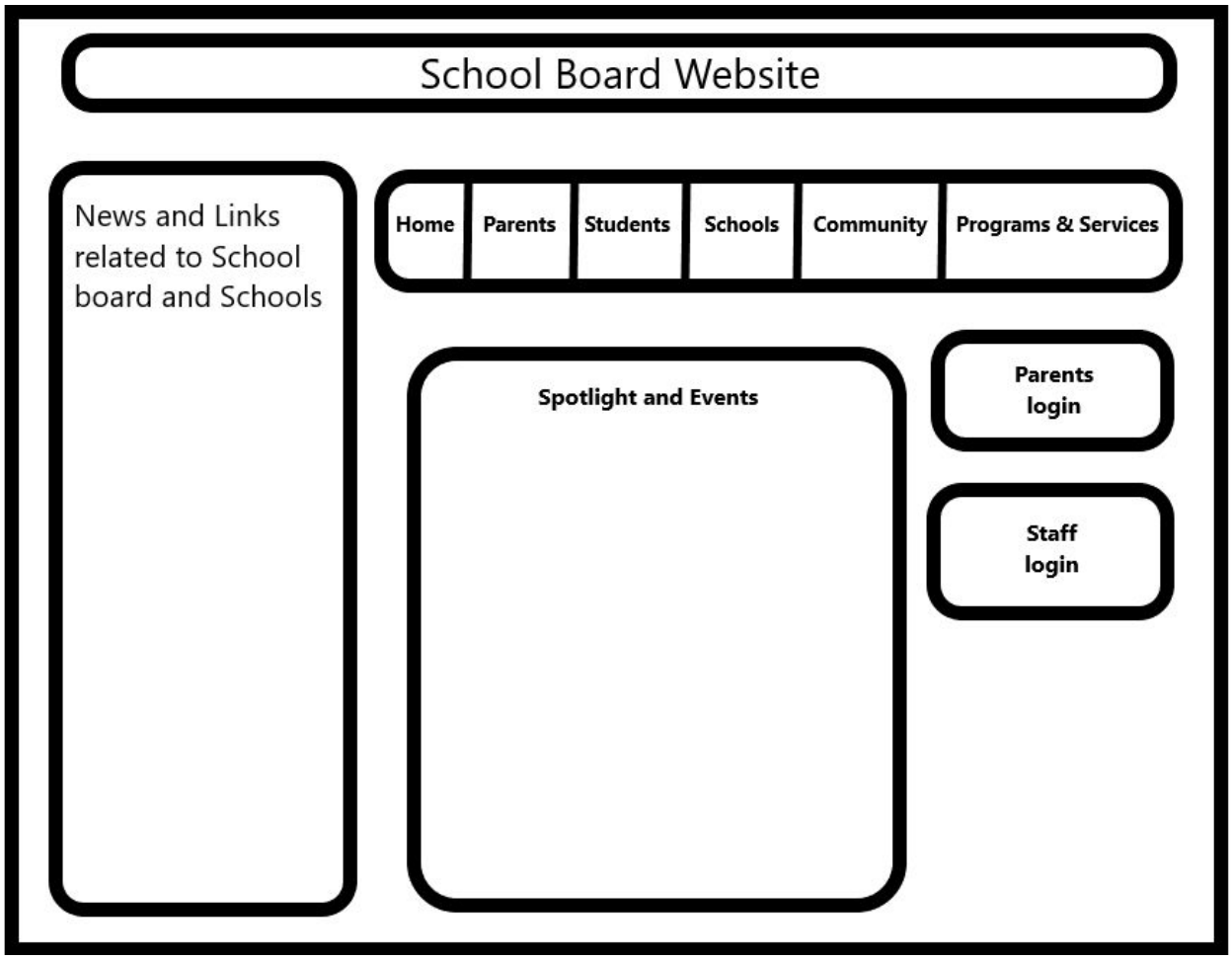



***Figure 1:*** *Main page of the School Board Website.*

The main page allows parents to use the "Parents login," and allows school administration, teachers and supply teachers to use the "Staff login."

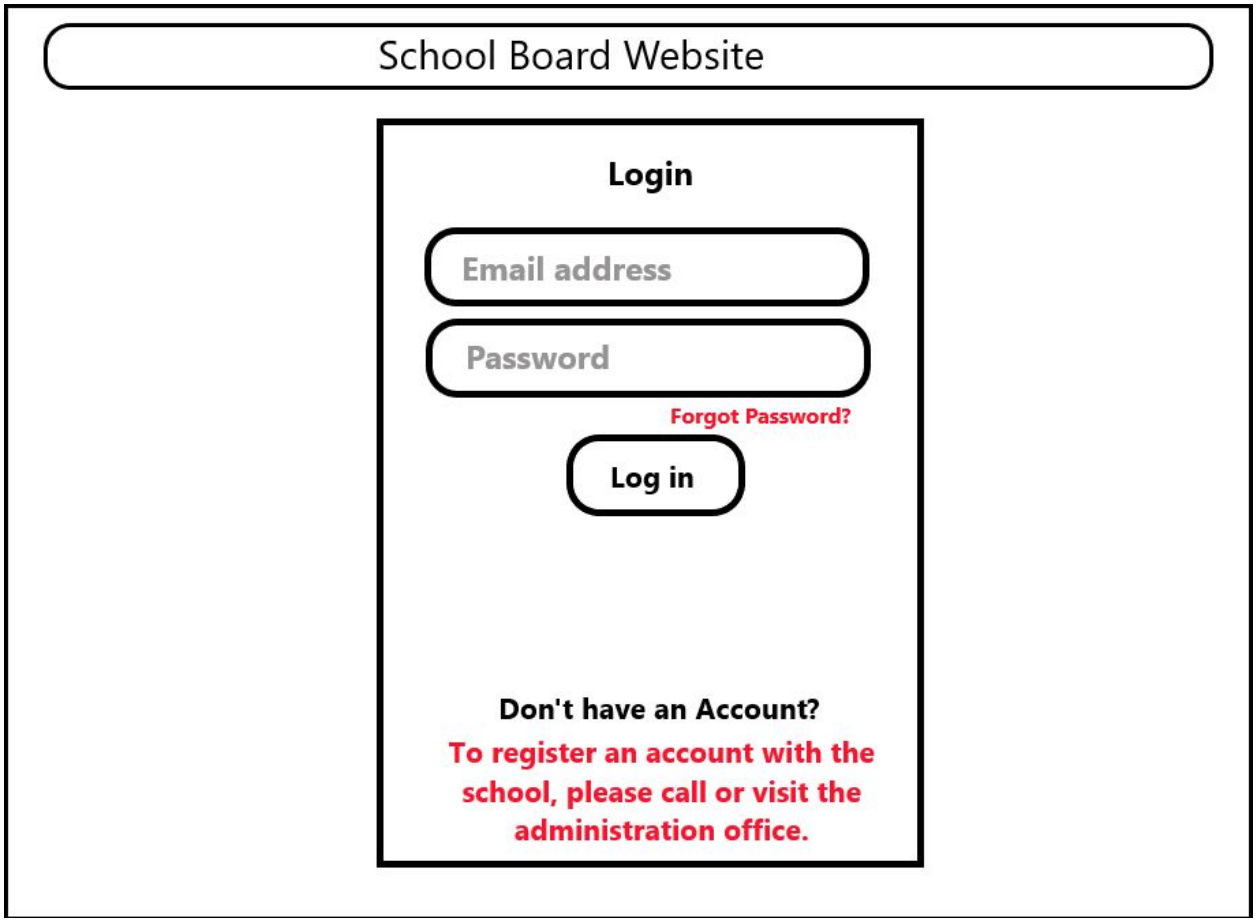



***Figure 2:*** *The login page for both "Parents login" and "Staff login" will look the same.*

For ease of use and navigation on the website, the login page will look the same for both parents and staff login. The login process will be handled by the system in the background. The login page should allow users to click on "Forgot Password?" in case they ever are unable to login to their account. A constraint if by chance a user does not have an account setup, they will have to contact the administration office, which can then verify whether the parent indeed has any child that goes to the school. The reason for this is because schools already have parents and their information with them and they will be able to verify that.

### 3.1.1 Parents Interaction

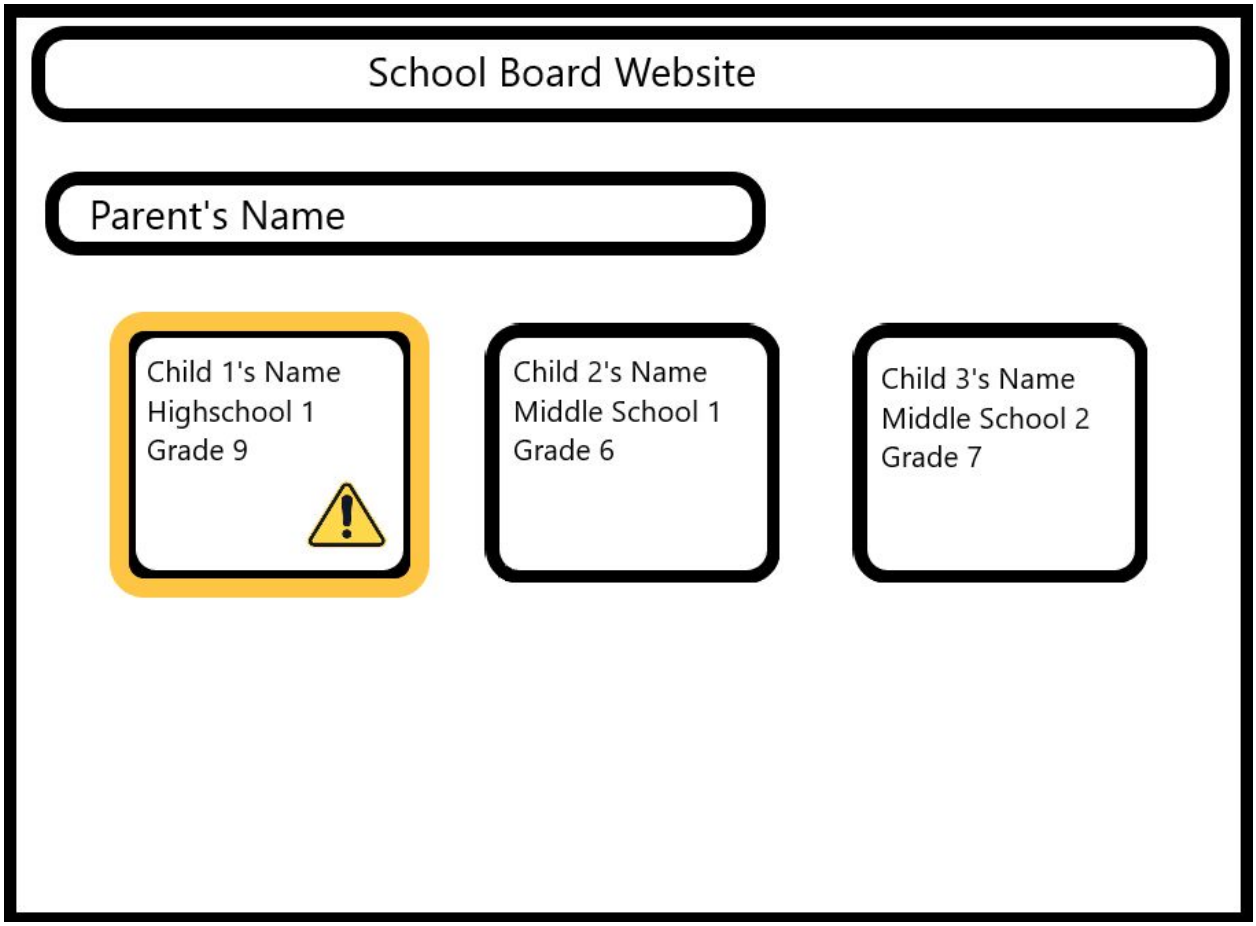



***Figure 3:*** *Parents will be shown all their children, and the school and grade they are enrolled in.*

Parents will be able to select whichever child's attendance they would like to view. The yellow outline and the Attention icon shows that there are new notifications regarding that specific child. For example, if they click on Child 1's profile, they will be taken to a page shown in Figure 4 below.

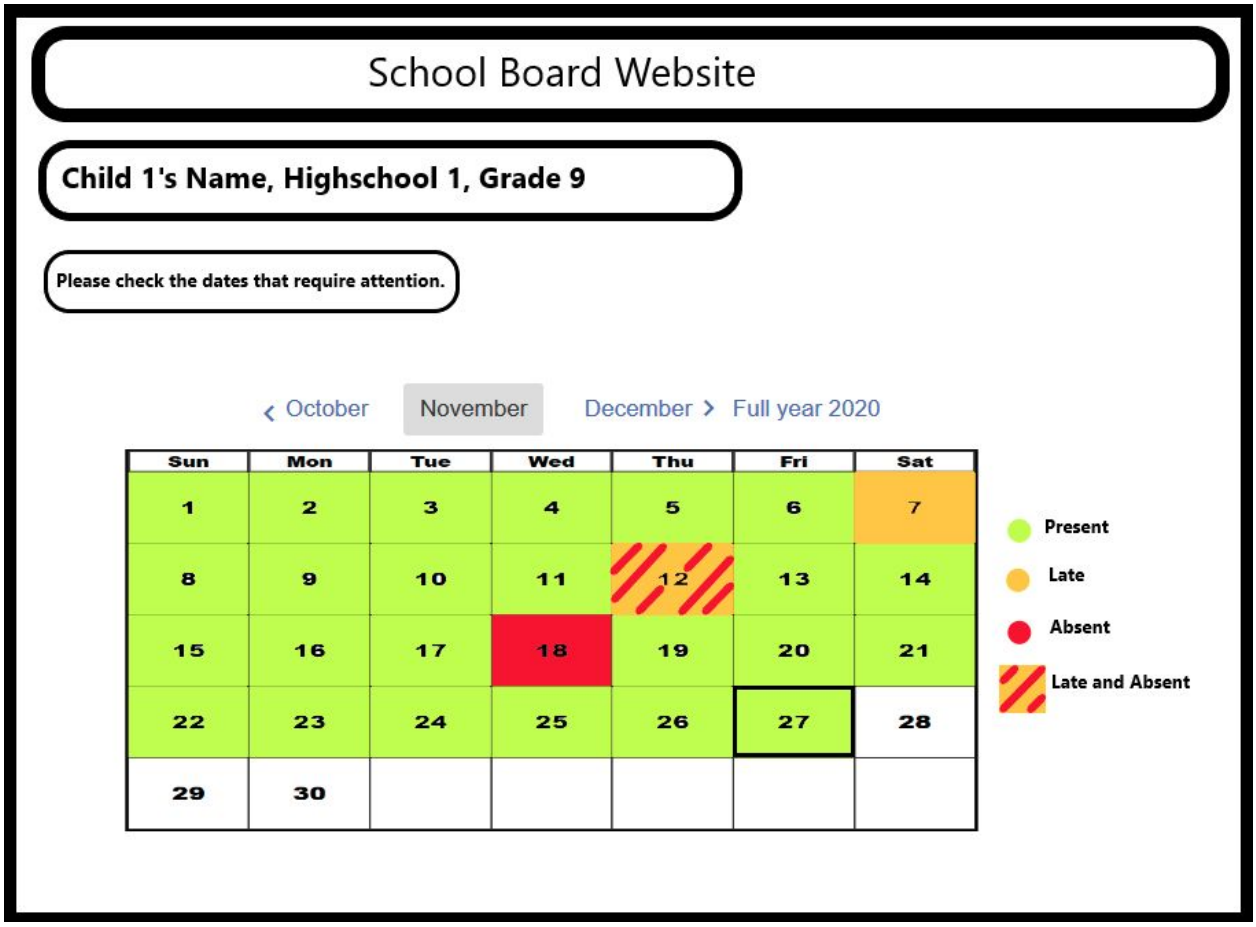



***Figure 4:*** *Parents will be presented with the child's attendance for the current month.*

On the calendar, the dates that require some kind of attention will be highlighted. A legend will be provided so a parent can understand what the highlighted dates mean. Such as in Figure 4, green was used to represent that the student was present in all the classes during a school day. Yellow represents that the student was late in 1 or more classes during a school day. Red represents that the student was absent in one or more classes during a school day. Yellow with red lines is used to represent a school day where a student may have been both late to a class and also absent from another class. An example of what a yellow with red lines represents in terms of a web page is shown in Figure 5 below.

Furthermore, a parent will be able to select a day in the future or even the current day (before the class starts), in order to notify the school that the child will be either arriving late to one of the classes or will be absent from any or all classes. More information is shown in Figure 6.

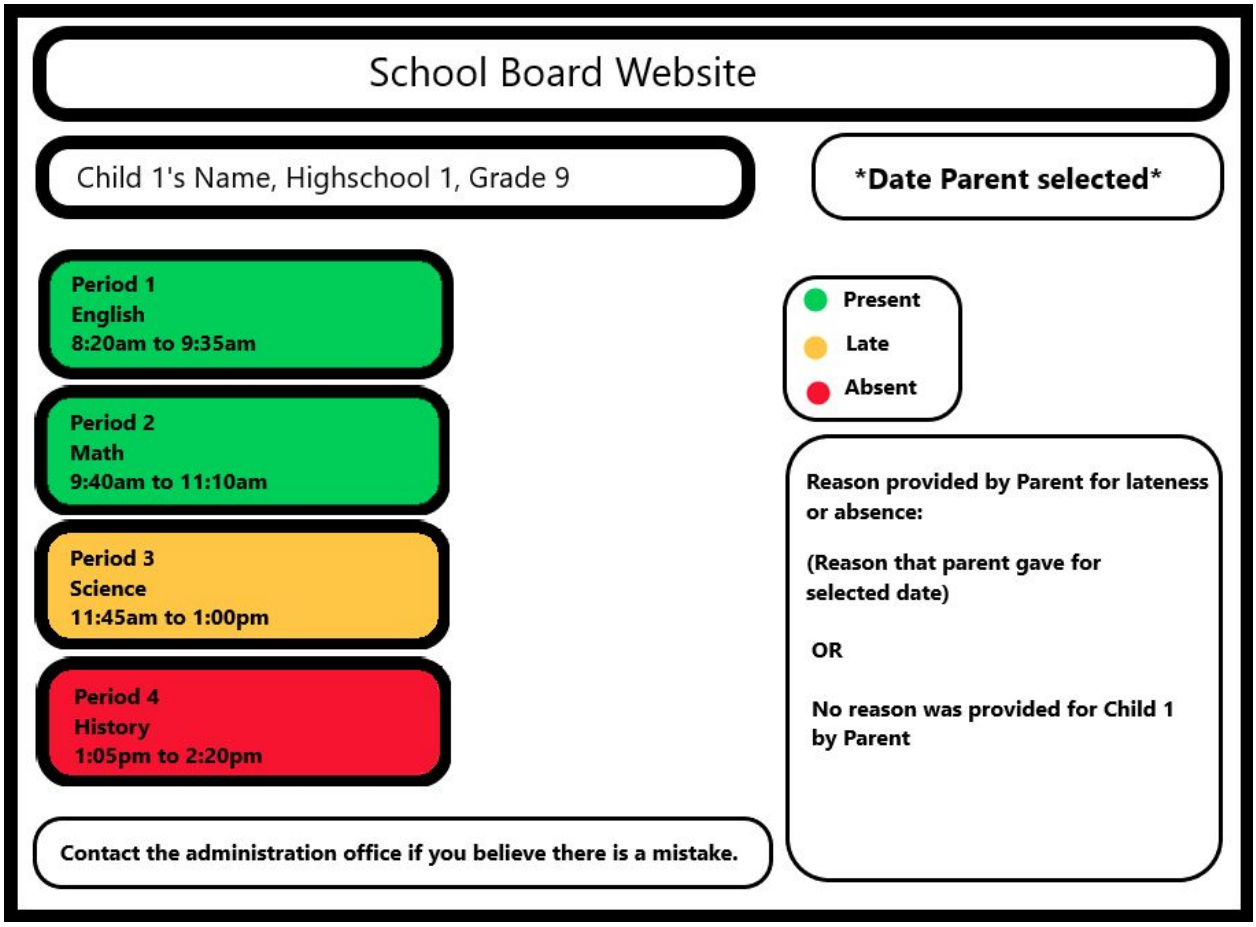



***Figure 5:*** *Child 1's attendance in the 4 classes that they are enrolled in.*

After clicking on the date with yellow and red lines on it, the parent is presented with the above web page. On the same page, a legend is provided to remind the parent about the attendance marking. In this scenario above, Child 1 was present in period 1 and period 2 when the attendance was being taken by the teachers. In period 3, the child arrived late to class and in period 4, the child did not show up at all. On the same page, the reason for any lateness or absence is shown if the parent has provided a reason. For example the parent had called the school earlier or marked the child absent on the website themselves, then the reason that they provided at the time will be displayed here. If no reason was provided, it will also be shown as such. In Figure 6, a parent can provide a reason.

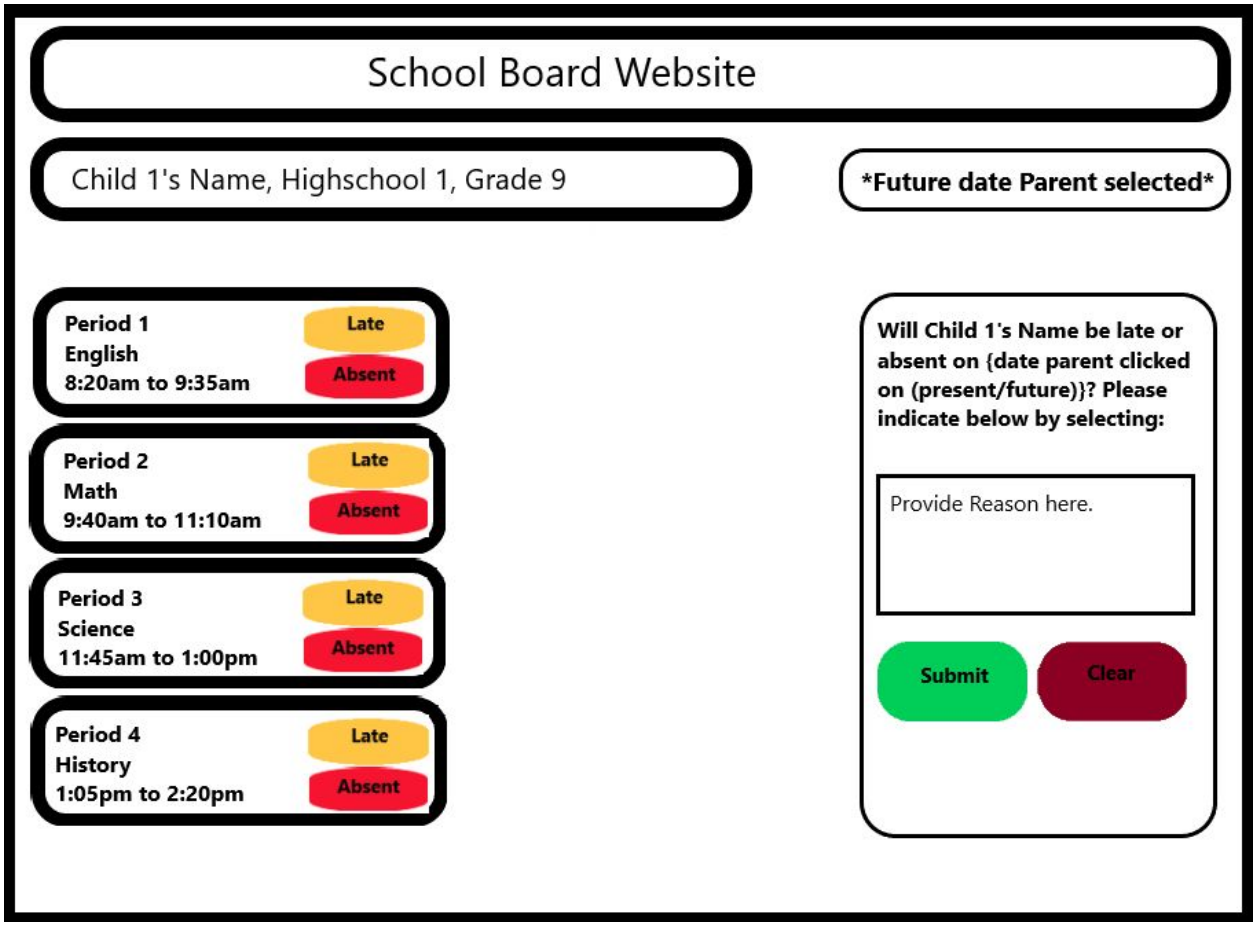



***Figure 6:*** *Webpage for a future date where Parents can mark their child as late or absent in advance.*

If the parent knows that their child will be late or absent on a particular day, using the same calendar in figure 4, they can select any future date and mark off their child as late or absent (either for all periods or for any particular period). In this scenario, we assume that this particular "Highschool 1" has 4 periods in a regular school day. Once they have selected the periods, the parents will then provide a reasoning in the textbox and can then submit the reasoning.

### 3.1.2 Teachers and Supply Teachers Interaction

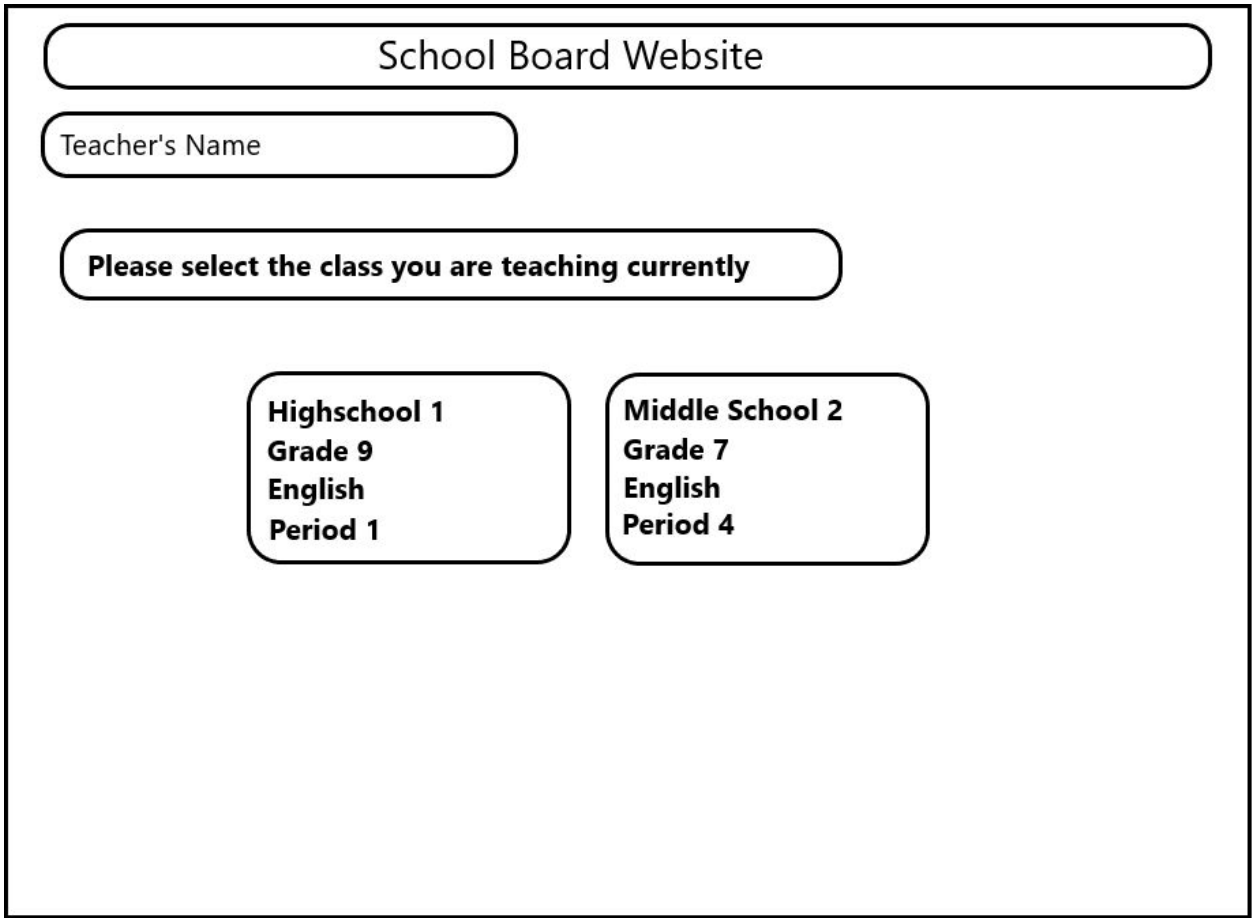



***Figure 7:*** *Web Page displayed when the teacher logs in.*

When the teacher clicks "Staff Login" as shown in Figure 1, they will then enter their credentials on a page identical to Figure 2, after which they will be taken to a page where they will be shown all the courses they are teaching, along with the schools they are teaching at, and during which period they are being held. In the example shown here in Figure 7, this teacher teaches Grade 9 English during Period 1 in High School 1. They also teach Grade 7 English during Period 4 in Middle School 2. The teacher's interaction after clicking on "High School 1" is shown in Figure 9.

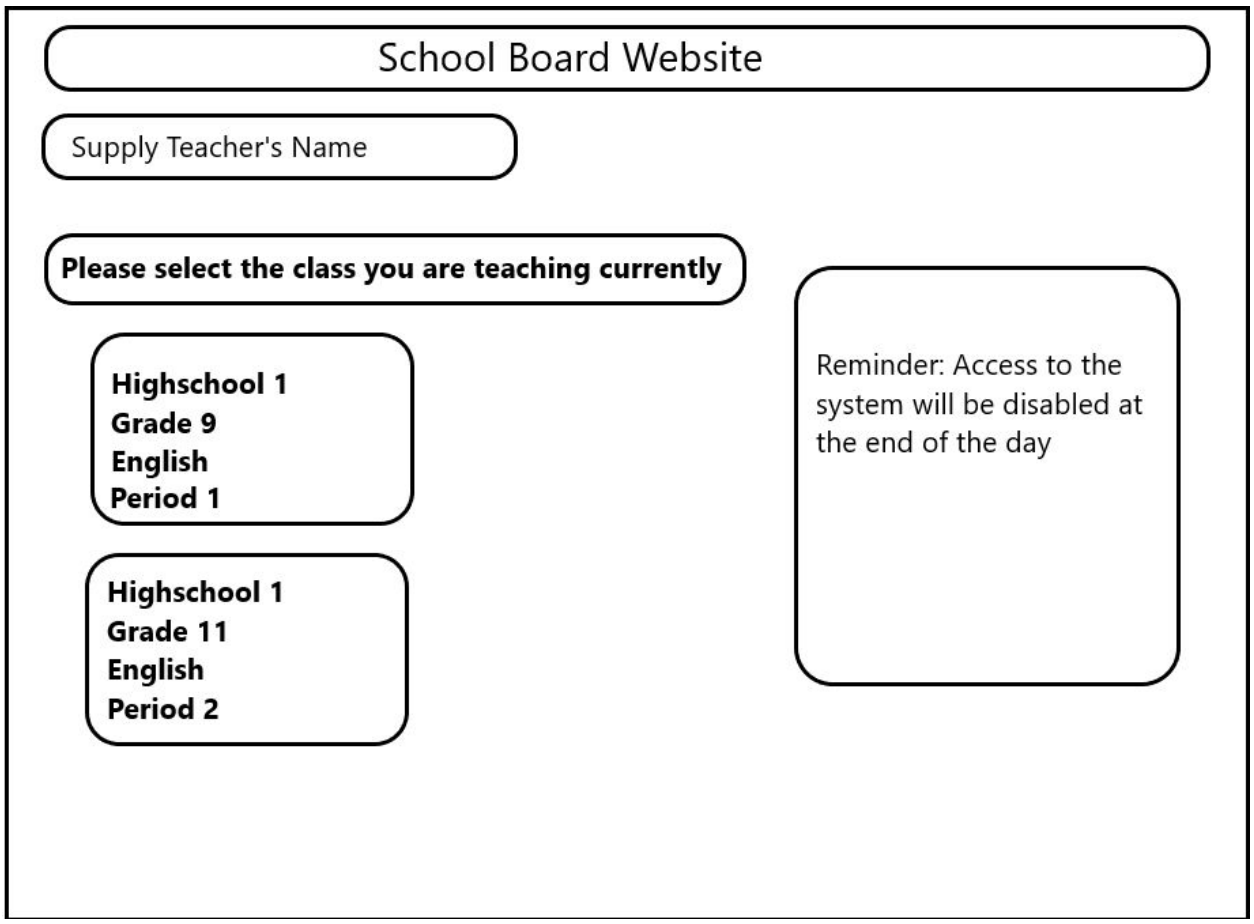
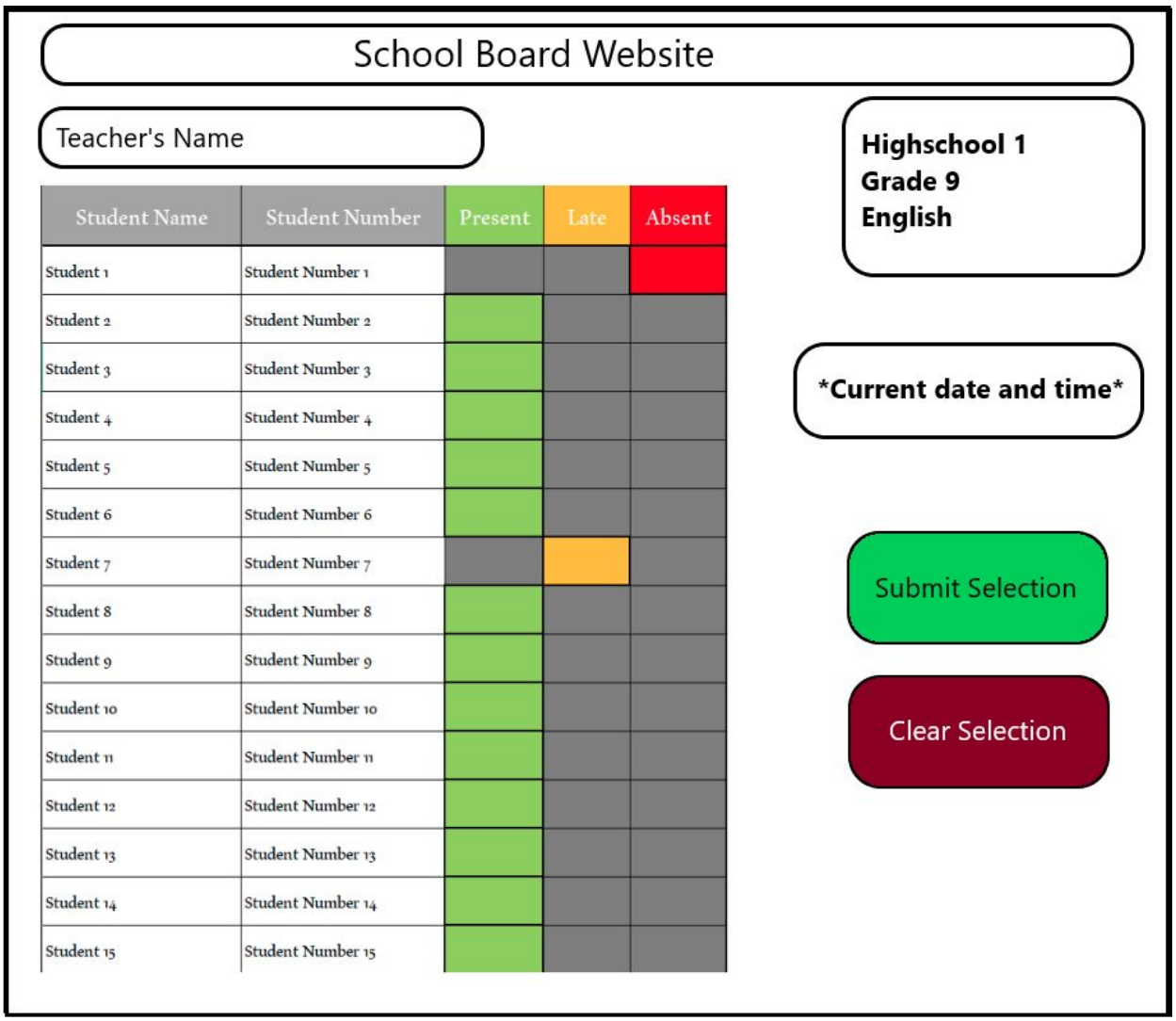



***Figure 8:*** *Web Page displayed when the supply teacher logs in.*

The web page after a supply teacher logs in using the temporary unique ID and password provided by the secretary will take them to a very similar page to a regular teacher's web page as seen in Figure 7. The supply teacher will have the same privileges as a regular teacher except their credentials will expire by the end of the school day and they won't have access to the system until the secretary reassigns them a new unique ID and password for a new day. In the above example, the supply teacher is teaching 2 courses at the same High School for Grade 9 and Grade 11 during periods 1 and 2, respectively.




| Student Name | Student Number | Present | Late | Absent |
|---|---|---|---|---|
| Student 1 | Student Number 1 | | | |
| Student 2 | Student Number 2 | | | |
| Student 3 | Student Number 3 | | | |
| Student 4 | Student Number 4 | | | |
| Student 5 | Student Number 5 | | | |
| Student 6 | Student Number 6 | | | |
| Student 7 | Student Number 7 | | | |
| Student 8 | Student Number 8 | | | |
| Student 9 | Student Number 9 | | | |
| Student 10 | Student Number 10 | | | |
| Student 11 | Student Number 11 | | | |
| Student 12 | Student Number 12 | | | |
| Student 13 | Student Number 13 | | | |
| Student 14 | Student Number 14 | | | |
| Student 15 | Student Number 15 | | | |

***Figure 9:*** *Interactive attendance sheet for Grade 9 English in Period 1.*

The teacher will call out a student's name and will mark them present, late or absent. If a student is present, the teacher clicks on the box in the column that states "Present" in front of the student whose name has been called and is present. The grey box will turn green. If the student is late, the teacher clicks on the late box next to the student and the grey box will turn yellow. And lastly, if the student is absent from the classroom and did not reply to their name, the teacher will select the box under "Absent" and the grey box will turn red. Only one option can be selected at a time, meaning, a student cannot be marked late and absent for the same period.

In terms of pre-marked absences, as an example, if a parent marked their child as absent ahead of time for that particular day, the child's "Absent" box will be marked red already. This would require no further action from the teacher (unless the student actually shows up to class, and in that situation, the teacher can mark that student as present, or late if the child arrives late to class). If the teacher has already submitted the attendance, the student will have to go to the administration office to get a secretary to mark them late.

### 3.1.3 Administrators Interaction

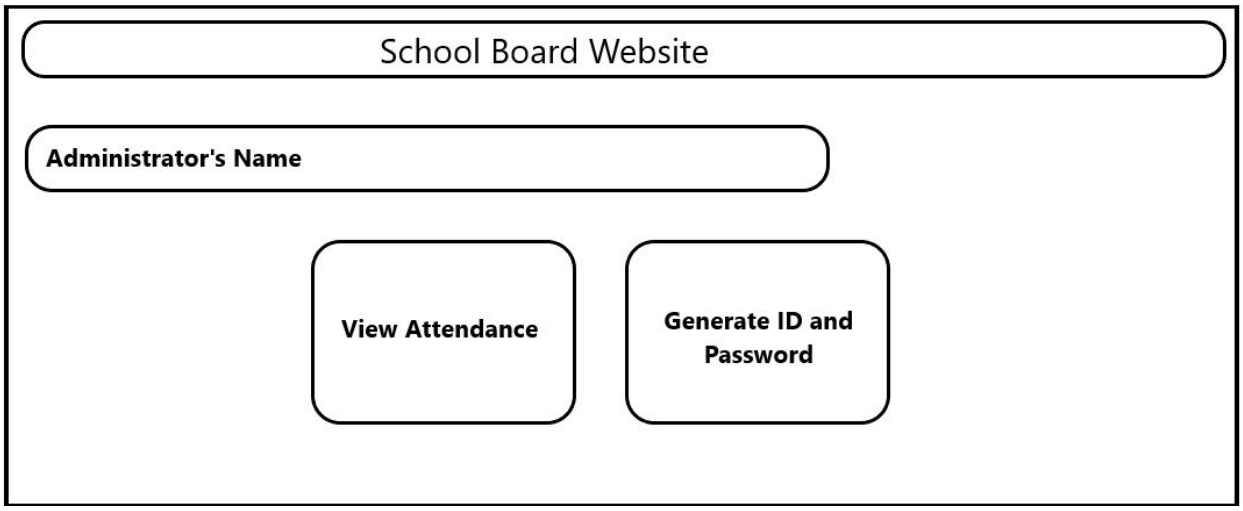



***Figure 10:*** *The web page that is presented to a secretary when they log in.*

A secretary will have the option of viewing the entire school's attendance and have the ability to generate ID and Passwords for other users of the website. In this scenario, the secretary clicks on "View Attendance" and is presented with the web page as shown in Figure 11 below.

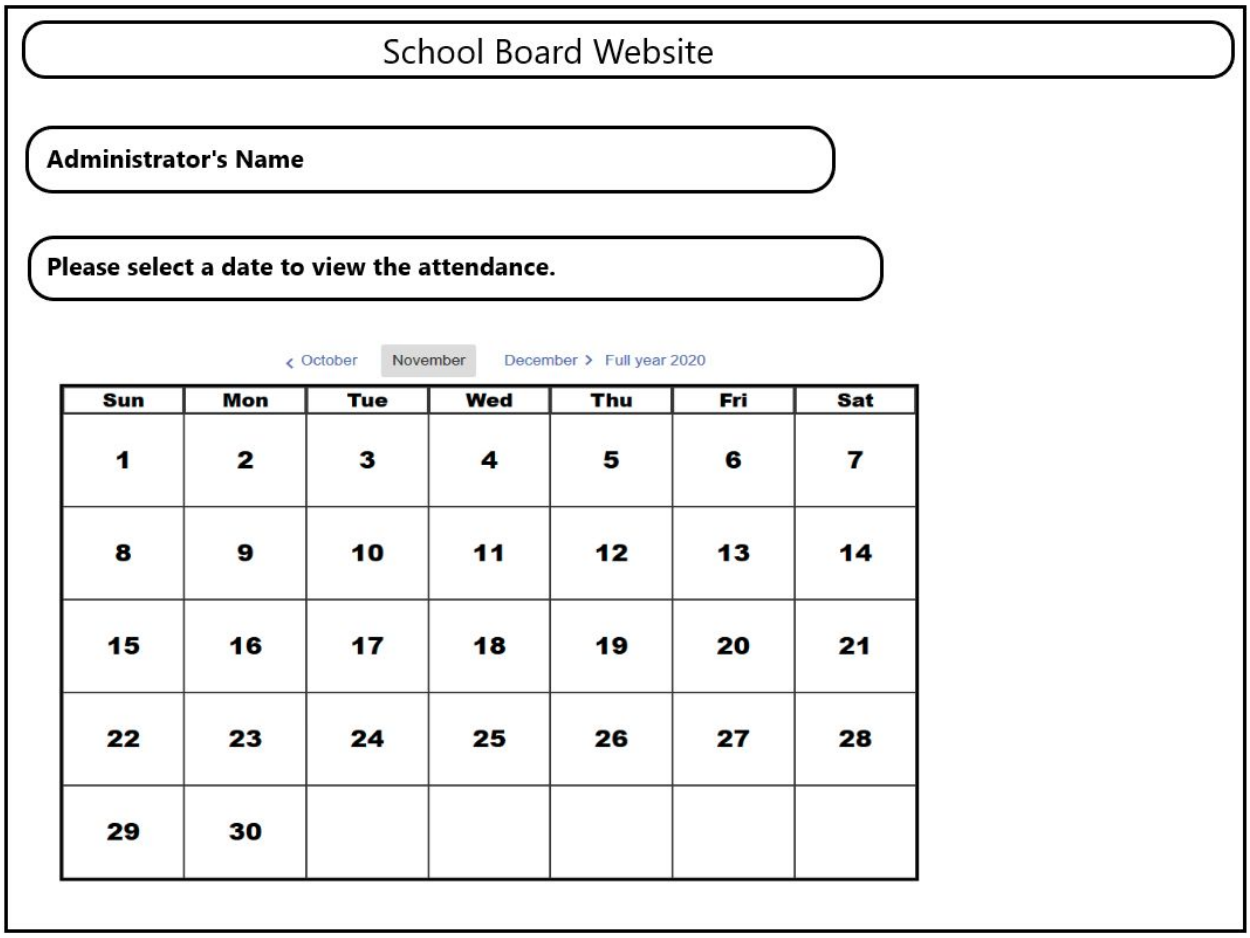
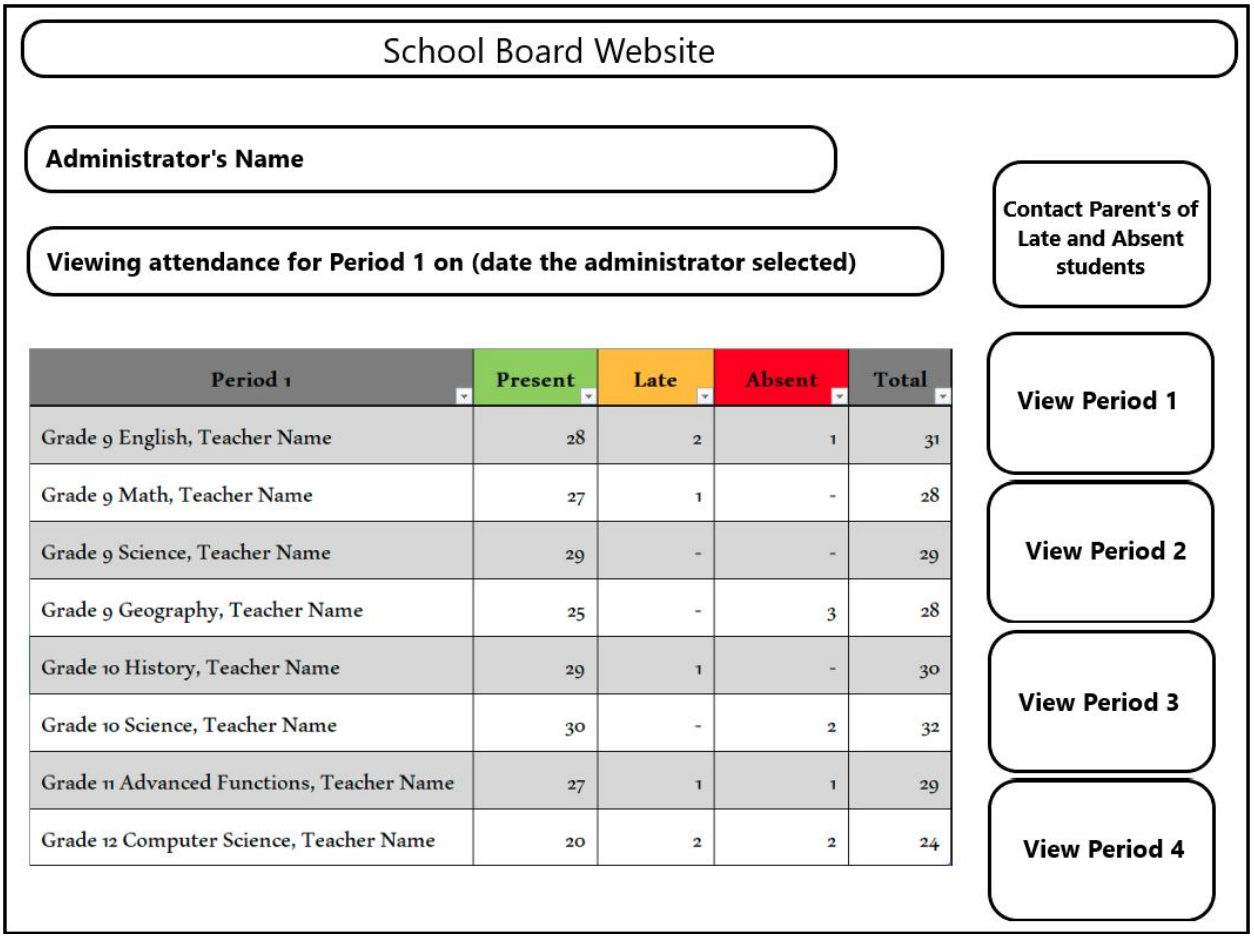



***Figure 11:*** *Secretary gets to choose the date they want to view the attendance of.*

Clicking on the current date will present the secretary with Figure 12. The secretary has the option of viewing the attendance records for all the past dates (for however long the records have been kept in the database).




| Period 1 | Present | Late | Absent | Total |
|---|---|---|---|---|
| Grade 9 English, Teacher Name | 28 | 2 | 1 | 31 |
| Grade 9 Math, Teacher Name | 27 | 1 | - | 28 |
| Grade 9 Science, Teacher Name | 29 | - | - | 29 |
| Grade 9 Geography, Teacher Name | 25 | - | 3 | 28 |
| Grade 10 History, Teacher Name | 29 | 1 | - | 30 |
| Grade 10 Science, Teacher Name | 30 | - | 2 | 32 |
| Grade 11 Advanced Functions, Teacher Name | 27 | 1 | 1 | 29 |
| Grade 12 Computer Science, Teacher Name | 20 | 2 | 2 | 24 |

***Figure 12:*** *The secretary is presented with an overview of all the classes in a list for each period.*

In the above example, the secretary is viewing the attendance of students for Period 1. The interactive list displays each grade, the subject, and the teacher's name for that subject. It also shows the total number of students in the class, the total that are present, late and absent as well. The secretary can select other periods to view the students in them as well. Lastly, the secretary has the ability to contact the parents of late and absent students (shown in Figure 14). Let's assume that the secretary clicked on "Grade 9 English, Teacher Name" in the first row. They will be then presented with Figure 13 below.

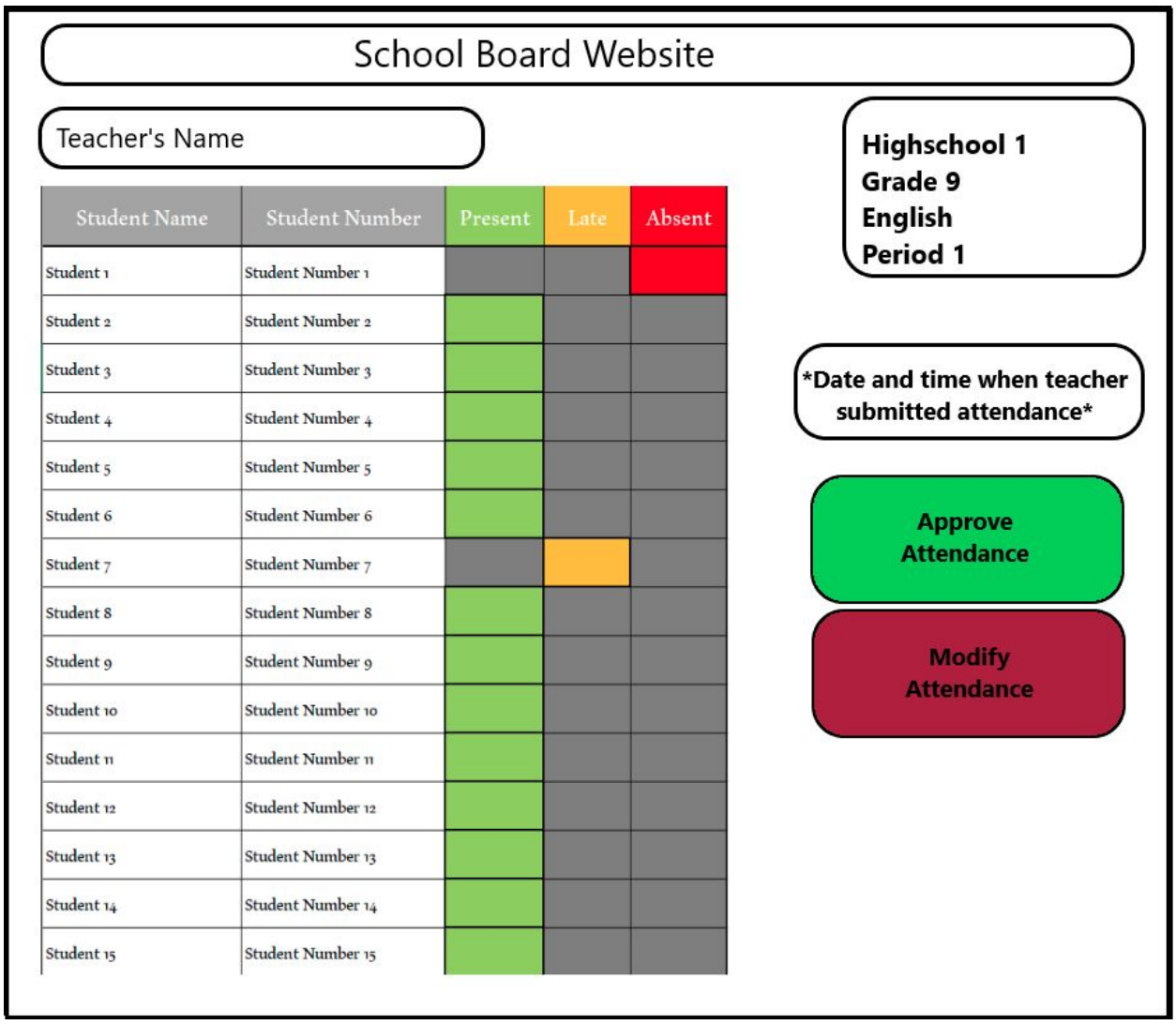



***Figure 13:*** *Expanded view of Grade 9 English for Period 1.*

The secretary gets to see which individual students were late or absent in that particular class they clicked on. They also have the ability to modify the attendance in case a student arrived after the teacher submitted the attendance for their classroom. In that situation, the secretary can modify the attendance to mark the student as "Late" instead of "Absent." Once everything is in order, they can just click "Approve Attendance" when no more change is required.

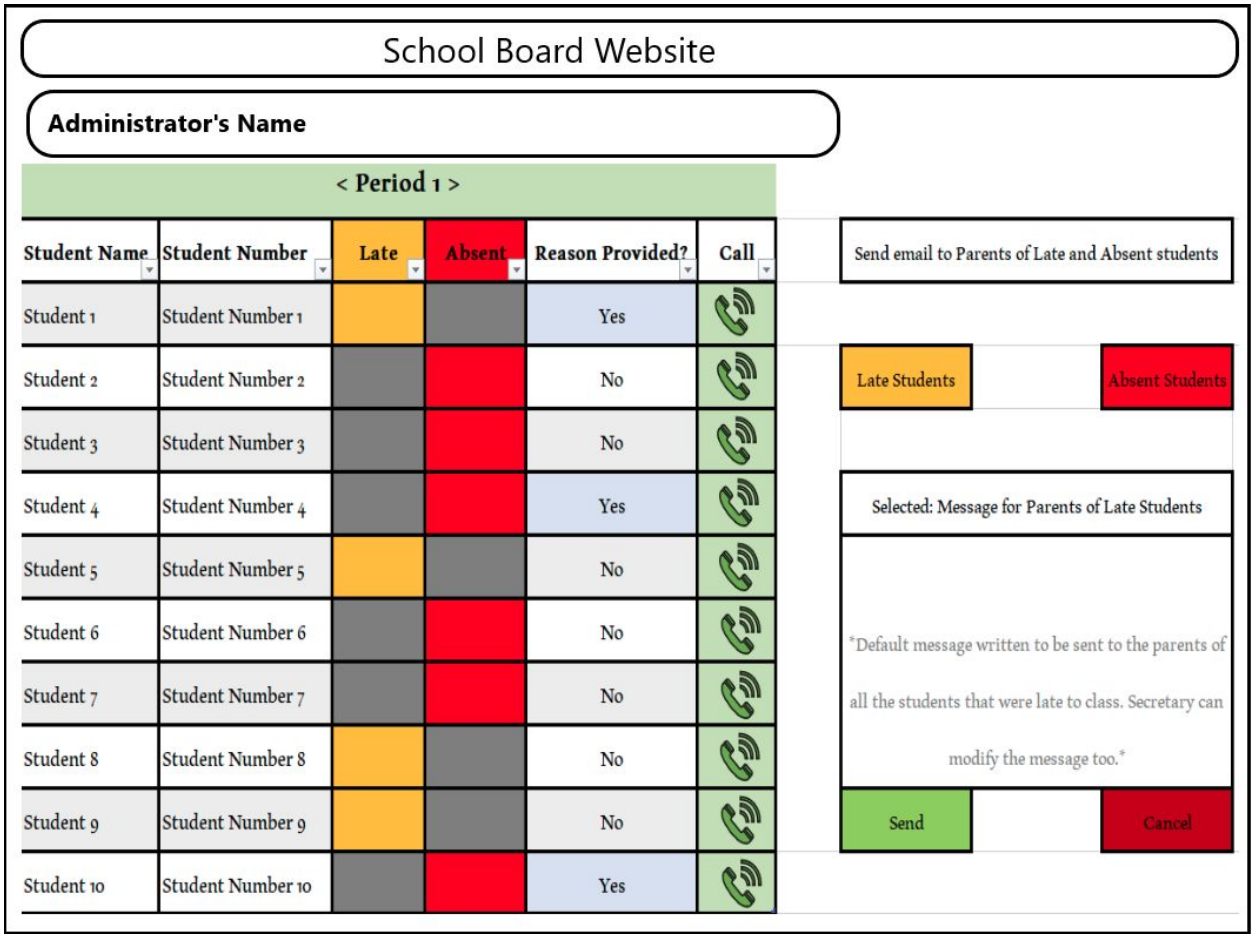



***Figure 14:*** *After approving, the system gives the secretary to contact the parents of the students.*

Once the secretary approves the attendance in Figure 13, they will be provided with a more specific table of all the students that require special attention. This table will let the secretary know if a student was absent or late with a reason or not (no need to contact parents if reason provided). If no reason was provided, the secretary has the ability to send an email to all the parents of the students who were late or absent for that period. If the secretary chooses to send an email to the parents of "Late Students," a textbox below will auto-fill with a message meant for students who were late in Period 1 and can be sent to the parents. The message can be modified by the secretary. If they want to email the parents of students who were absent, they click on the box that says "Absent Students," and the textbox will auto-fill with a message meant for students who were absent from class. Sending emails to both late and absent students' parents automatically ensures that no email is sent to the parents of students who had provided a reason already. On top of that, the secretary has the ability to call the parents of each student. Pressing the green phone icon sends the parents of the student an automated phone message notifying them about the student's lateness or absence.

## 3.2 Hardware Interfaces

The requirements to get this software running properly are not too resource intensive. The latest and stable version of Chrome, Firefox, Internet Explorer, Microsoft Edge or Safari is sufficient enough to access the website on either a system running Microsoft Windows, Linux or Mac OS X.

## 3.3 Software Interfaces

- The software is going to be a traditional webapp that runs on a browser and so it should be able to properly interface with the most popular browsers on their latest stable versions.
- It should also be able to save all the attendance records and the login details of all the users mentioned in Section 2 in a database. [See Section 6.1 for more details on this]
- Any third party libraries can be used as long as the libraries being used have Open Source licenses.

## 3.4 Communications Interfaces

The initial version of this product will be a mock of the communications architecture to see how the users such as the secretary, teacher, parent, and supply teacher would interact with the system. It would require basic frontend functionality as well as using CSV files for providing the information on students and parents. This would act as the database needed for creating the attendance pages for the teacher to fill out throughout the day. See Section 6.1 for Database details

For a future version of this website, a communications architecture can be implemented where it would be following the client-server model. This model should utilize a REST-compliant web service and should be served over HTTP Secure. To facilitate the REST API, we could have a dedicated front-end and back-end for the website to be more user friendly so as to create more ease of service towards the users. Overall, this would help with the synchronization of notifications received by the parties involved with the site and receiving emails and automated phone messages to ensure these parties have the knowledge needed. A RDBMS system would be crucial in the future for security and organizational reasons so as to directly link the information to the website.

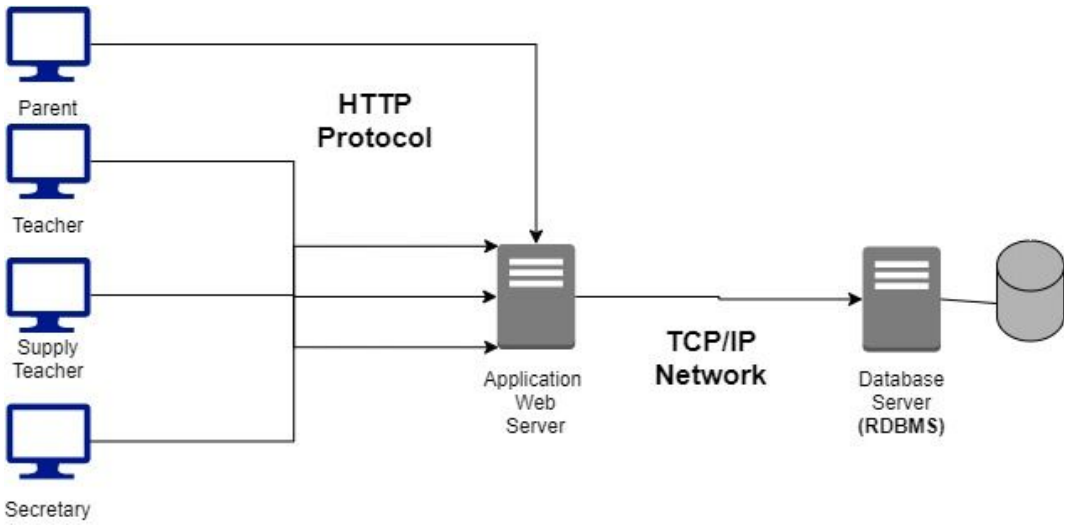



***Figure 15:*** *Future communications interface for SAS website*

# 4. System Features

For the scope of this document, we've chosen to represent the features of the system through an abstracted list of essential functionality. All features in the following section will be utilized in some shape by all users, specified clearly in requirements below and throughout this document. For more information on the specifics to how features are implemented on a by-user basis, please see Section 2.3 and Section 3.

## 4.1 Check Students Attendance

### 4.1.1 Description and Priority

Parents, teachers, and administrators all need to check a student's attendance before being able to make any adjustments to the record. This feature is of high priority, as it is essential for core functionality of the application.

- Benefit: 9
- Penalty: 1
- Cost: 3
- Risk: 2

### 4.1.2 Stimulus/Response Sequences

First, all users must login to their account. Following this the system will display all relevant students and options available to a user. At this point the user will navigate to the student in the means laid out for that respective user. Teachers find students in a list of all students in that class/period that is updated on their account as classes end. Parents find the student they're looking for from a collection of all their children in the school board. Admins search for students based on name, number, or other relevant fields. Once the desired student is found, the user will select day of record (in the case of teachers, the only available records are that of the class currently in session).

### 4.1.3 Functional Requirements

REQ-1: Must be a respectively appropriate means for all users to navigate to a student's record.

REQ-2: Parents must only be able to access their children's records.

REQ-3: Teachers must only be able to access the attendance of students in their current period class.

REQ-4: Admin must be able to access all students.

## 4.2 Update Students Attendance

### 4.2.1 Description and Priority

Teachers must be able to mark students that are present, absent, or late for a class. Parents must be able to let school know of absence or tardiness. Admins must be able to adjust a student's attendance on special instances. This feature is of high priority, as it is essential for core functionality of the application

- Benefit: 9
- Penalty: 2
- Cost: 4
- Risk: 3

### 4.2.2 Stimulus/Response Sequences

Teachers receive the digital attendance sheet for each respective class as the day progresses, they must mark students using this sheet while doing roll call and can submit when finished or wait until the class to end for the system to update the last version of the attendance sheet. Parents must select the child they wish to update the attendance of from a list of all their children displayed on login. Parents then select time and or day of absence from the ui tools available. After confirming the absent student acknowledgement, parents can submit the change and it will be reflected in the students record. Admin must select the day/period they wish to alter after finding the student in the system, they may then make any changes they need to to keep the records accurate.

### 4.2.3 Functional Requirements

REQ-4: User's must have used actor specific means to bring the student's record up.

REQ-5: Parents must be able to let the school know of absence or tardiness for all classes/days that haven't happened yet.

REQ-6: Teachers must be able to update any student in their classes attendance record during that class and at no other times.

REQ-7: Admin can update any student's record at any point and time.

## 4.3 Send Notifications

### 4.3.1 Description and Priority

Parents receive notifications of any absence or tardiness of their children that haven't been noted beforehand by the parent. Notifications are sent out over email, and all possible connected devices. This feature is of high priority, as it is essential for core functionality of the application

- Benefit: 8
- Penalty: 3
- Cost: 4
- Risk: 5

### 4.3.2 Stimulus/Response Sequences

If at the end of the school day a student has any absences or tardinesses on their daily record that were not given acknowledgement in advance via parents using the system, parents receive a notification to channels on record for each parent for all their children respectively.

### 4.3.3 Functional Requirements

REQ-8: Parent receives notification when child is absent or tardy

REQ-9: Parent only receives notification when absence or tardiness not marked down beforehand by parent

REQ-10: Parents must receive notification on all channels accessible and not blacklisted by the parent or admin.

## 4.4 Generate Unique ID

### 4.4.1 Description and Priority

The system must create a unique ID for each user of the system upon account creation for the purposes of distinguishing user privileges and data access. Supply teacher accounts must all be destroyed at the end of the day. This is of high priority, a functional and secure ID generation system will be essential to the system requirements.

- Benefit: 9
- Penalty: 1
- Cost: 3
- Risk: 1

### 4.4.2 Stimulus/Response Sequences

Upon system initialization there will be one administrator account from which others can be added to properly resemble the system-as-is. After this the initial account may be kept or removed at the administration's discretion and administrators may set the system to creating unique IDs for parents and teachers in the records as-is.

### 4.4.3 Functional Requirements

REQ-11: Users must all have a unique ID
REQ-12: Supply teacher ID’s are removed at the end of every school day
REQ-13: IDs are immutable

# 5. Other Nonfunctional Requirements

## 5.1 Performance Requirements

For the sake of performance of the application and upholding the structure that is laid out, the following abilities should be restricted. Firstly, the students should not be able to have the same permissions as the parents nor the teachers nor administrators to avoid any concurrency and illegitimate updates to the system. The application should be capable of handling a mass number of users at one time, and be able to provide the respective information and privileges associated with each of those users. The application should be portable to avoid any changes in design of the application between operating systems, and users should be given the ability to change password, should there be an access related issues with login, and be replaced synchronously with the system and acknowledged by administrators.

## 5.2 Safety Requirements

The requirement that details the fact that administrators and teachers are able to update the system with student attendance presents some safety concerns, such as possible loss of information regarding whether not the student was actually present, tardy or absent. That said, there must be the appropriate safeguards to ensure attendance is accurately marked. One, the user whether they be administrator or teacher must be logged into the system to perform such tasks, and secondly, there must be some form of confirmation and review of attendance before submitting to limit any errors on both administrator and teacher perspective, such as inaccurately presenting student attendance, or perhaps leaving entries in the attendance as null.

As per CSO practices for safe software security which also governs software safety in this regard, the system is to have a multi factor authentication system for each user, teacher and administrator included to verify credentials and when verifying attendance records, whether they be for submitting, viewing, or review. Next, the policy also states that the application should be monitored by these same administrators to verify any changes with the teachers to ensure that the information provided is accurate to avoid any possible loss of communication between the student to teacher, and teacher to parent.

## 5.3 Security Requirements

As per the requirements on potential actors in this system, the specified users must be logged into the application in order to use the application and features that follow it. That said, only the teachers, whether they be full-time or supply teachers will be given access to the application, along with the parents and students. Also, for the sake of security, students and parents will be given access to view the courses under which they have registered, and teachers with the courses which they will be teaching, for the sake of upholding the student and teacher's privacies. On the user interface there will be a prompt for login as per user identity authentication. The attendance aspect of the application is to be viewed by the above mentioned stakeholders, as for the backend of this application, only the developers of this application will have access to it to mitigate any security risk.

As per CSO practices for safe software security, the project should be executed as part of a container to instantly inherit that posture when it lives in a container. By doing this, this allows the mutability of code to be ignored by outside users, as users outside of the system cannot remote into the application to perform malicious actions. Next, the application should regularly be monitored and upgraded according to new vulnerabilities and exposures detected not only on this system, but in response to news following vulnerabilities in similar systems. Next, vulnerabilities should be scanned and mitigated regularly to avoid any intrusions of the system. Next, for the sake of stakeholder security over their sensitive information, there should be a multi factor authentication associated with this application to ensure the stakeholder is synchronously aware of logins by themselves only.

## 5.4 Software Quality Attributes

The specified users are to use this application on a computer, meaning that this application is intended to be run on a Windows OS, Linux, or Mac OS. That being said, the application is to remain the same on these different operating systems with the same front end and back end system, and is to be available synchronously from the servers and the end users no matter the platform operating system that they may be using. Also, this application use should remain on the computers for the time being, as there is no smart phone application applicable to this design. There should be testing done on the specified features in response to many if not all actions taken by each stakeholder for each of the major features to ensure that the system is robust enough to avoid any exceptions being thrown, and must again, be only used by specified stakeholders. This application is to be reusable, as in the application should be able to retain information for its previous state, while allowing users to proceed to the next state whenever they choose.

## 5.5 Business Rules

As per the features listed in Section 4 of this report, parents should only be given access on this application to review the attendance status of their respective child or children and receive notifications of this child or children, furthermore, students should not have any access in this application to avoid any mishandling or misinterpretation of information with the application. Next, the teachers should be able to pull up and review student attendance information, along with updating this information. And lastly, the administrator should be able to review the student attendances, be able to update student attendance information, allow user ID's to be generated as per teachers whether they be immutable, or as supplies, and parents, finally administrators should be to review notifications to be sent out to parents.

# 6. Other Requirements

## 6.1 Database Requirements

The development team may choose to use a modern database to hold all the student attendance records and any persistent storage. But if the delivery of this project before December 5th is an issue then CSV files or Comma Separated Value files that hold all the appropriate details for each of the stakeholders and also the attendance records of each student can be clearly tracked. Then going down that route is completely acceptable as a first draft of this project.

# Appendix A: Glossary

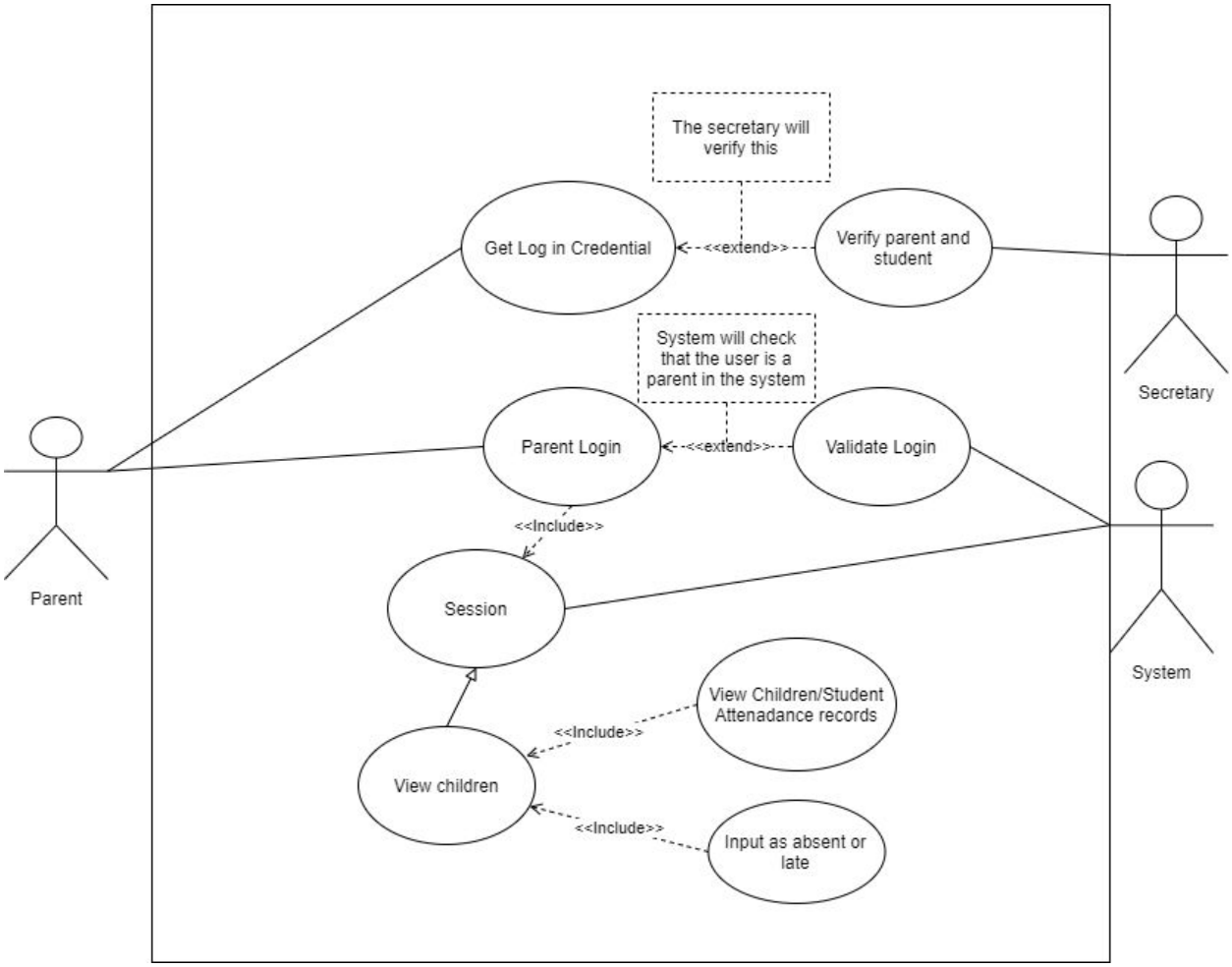
- Administrative staff, Admin, Administration, Administrator, Secretarial Staff & Secretary all refer to the same entity.
- Supply Teachers and Teachers are both Teachers and they have very similar characteristics but are two different entities. See User Classes [2.3] for their differences
- The name of the system is ‘Student Attendance System’ and its acronym SAS will be used throughout this document.
- Classes, Periods and Courses all refer to one specific duration of class time that teachers take the attendance of their students in.
- Students and Children are used interchangeably to refer to the same entity.
- Lateness is sometimes used interchangeably with tardiness
- Late and tardy are used interchangeably in some scenarios

# Appendix B: Use Case Diagrams

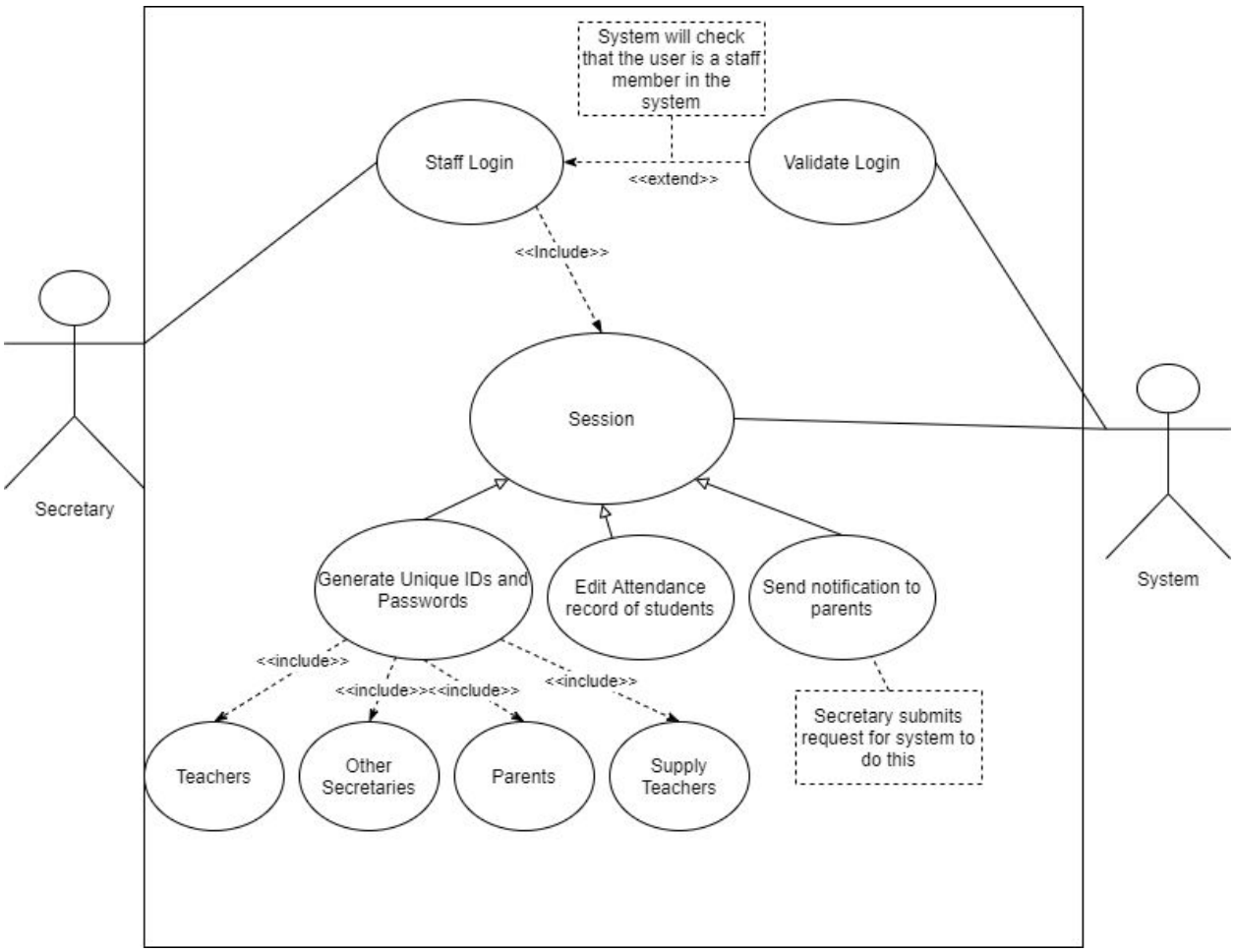
Users for SAS:

- Parents
- Secretary
- Teachers/Supply Teachers
- System itself

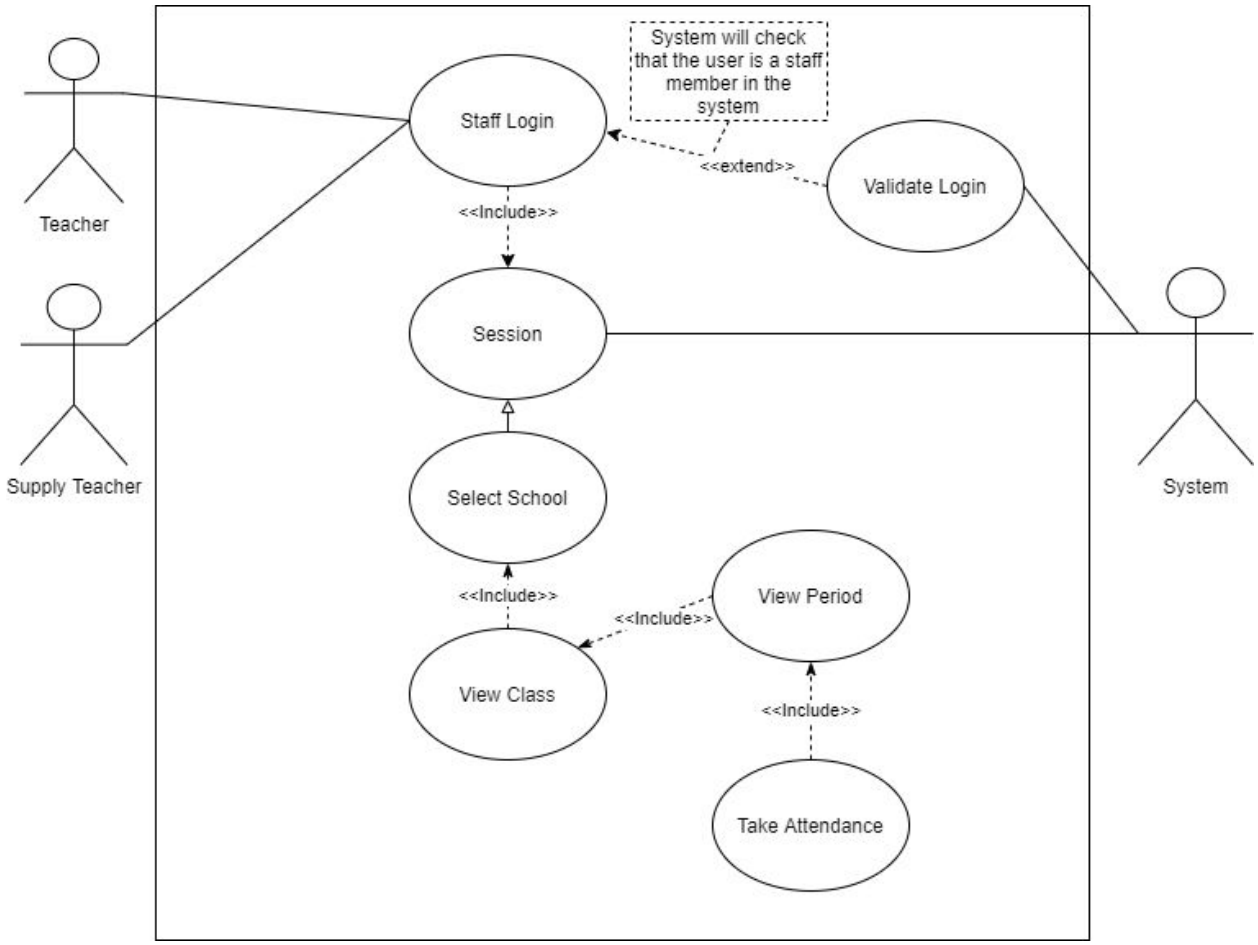
Use diagram for parents



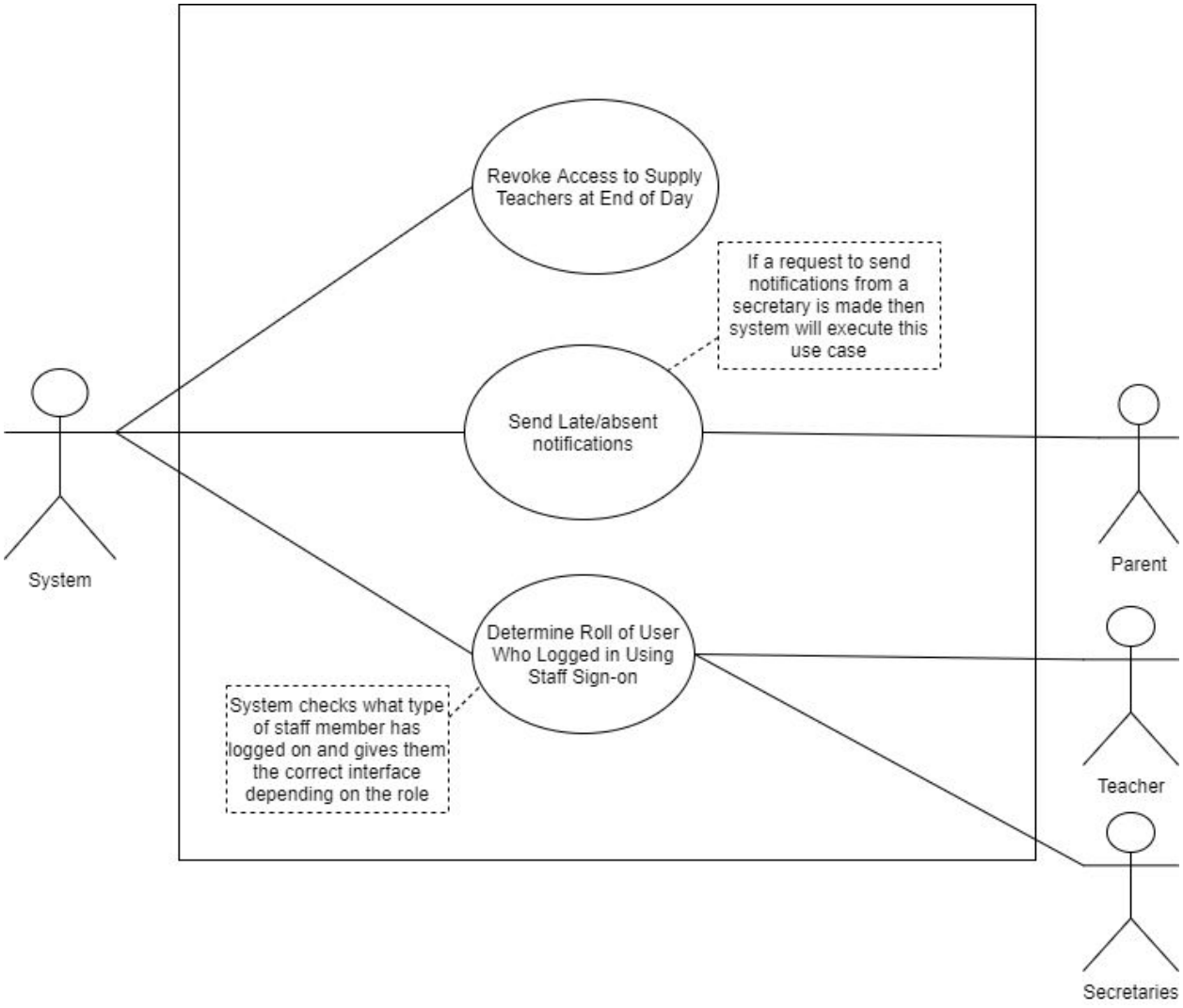
Use case diagram for secretary




Use case diagram for Teacher/Supply Teacher




Use case diagram for system


Revoke Access to Supply Teachers at End of Day
If a request to send notifications from a secretary is made then system will execute this use case
Send Late/absent notifications
Determine Roll of User Who Logged in Using Staff Sign-on
System checks what type of staff member has logged on and gives them the correct interface depending on the role
System
Parent
Teacher
Secretaries