Advanced Software Development Major Project

Project Title: CCGS Assistant

General Info

Developer Names: Joshua Chen

Roman Green Kenneth Lo

App Category: Productivity

Target Audience: CCGS staff and students

Device(s): Webapp – any device with a web browser (i.e. chromium based browser, safari or

equivalent)

Project Summary

Project Description:

The main objective of this app is to provide and easy-to-use voting system, specific to Christ Church Grammar School, that implements preferential voting. This would allow voters, including both students and staff, to automatically vote for the groups they are part of, including school, house, and boarding prefects.

As a secondary objective, the app will also serve as a student/teacher app, which allows students/teachers to easily set homework/assessment reminders, view their timetable and add events to a calendar. During the voting period of the year, an extra button will be temporarily available, allowing users to vote for prefects. **The voting section will also be available as a separate web app**, allowing students and staff to vote on either app.

The voting-only app is prioritised over the remaining aspects of the student/teacher app, as the current paper voting system is inefficient and outdated. Timetables, calendars and reminder apps exist; however, our app aims to combine this into a single app, specific to CCGS (e.g. automatically shows the user's timetable on Nexus). Note that the features of the student/teacher app will therefore be classified as desirable, as this app will only be implemented once the voting-only app is completed.

Research and

Development Required:

ReactJS, preferential voting system, databases

Team Responsibilities

Team Member	Responsibilities		
Joshua Chen	Scrum Master		
Roman Green	Development Lead		
Kenneth Lo	Design Lead		

Project Outline

Project Scope

The main problems our app combats are:

- o The lack of an efficient, electronic, automatic voting system within the school
- The lack of an electronic journal system, allowing students and teachers to record homework/tests/events/marking

Our app will provide these services to **CCGS staff and students**, integrating both features into a single handy app. Furthermore, the voting system will also be available as a separate web app, for easier access.

Research

Our group conducted an interview with Mr Taylor, the ICT services co-ordinator. Notably, he mentioned that:

- The current problem with using a service such as Microsoft Forms is that the voter is able to put in a preference for one candidate more than once.
 - I.e. Preference 1, 2, 3 = Candidate A
- Currently, the school does not use an in-house solution
 - Pays another company
- It is a preferential voting system, meaning that the person with the most amount of votes may not necessarily win

Our group also conducted an interview with Ms Stanton-Cook, who is in charge of the voting system at CCGS. Through this interview, we were given a list of aspects which our app needed to take into account. This includes:

- Our app should allow users to vote for their school, house and boarding prefects, depending on their house and whether they are a boarding prefect.
- All students have an equal voting power. Teachers have a voting power three times that of students.
- Student votes should be separated for each year group, and between students and staff. This is
 because in the past, some year groups have made a collaborative decision to vote for an unpopular
 candidate, and thus, this may not be reflective of strong candidates. Year 7s voting for Year 11s also
 provide useful information given that some of the Year 11s were Peer Support Leaders in their
 respective houses.
- Data should exported to a XLSX or CSV file to double-check candidates as above.
- When voting, a user should be able to see each candidate's name, image and short biography. This is important as some students/staff may recognise peoples' faces but not names.
- Candidates should be presented to each user randomly to avoid bias from 'donkey votes'.
- Student data (e.g. year group, house, whether they are a boarding student) can be obtained from a database created by Mr Masetti, but not directly obtained from Synergetic databases

Our group also conducted an interview with Mr Arthur. This includes:

• Using the OAuth2 token flow for authentication.

General Description

When opening the voting app, the user will first be presented with a login screen, where they enter their email and password. They will then be redirected to the main screen, which shows the votes that the user has yet to cast. When the user has voted for a particular group (school, house or boarding), this will disappear from the main screen. The voting page will consist of all candidates presented randomly down the screen, and the user has the ability to select up to six candidates in order.

The main student/teacher app will contain a dashboard showing the timetable, with tabs leading to each of the other components (diary, calendar, timetable, campus map, school information, voting system, settings). These tabs will be available on the sidebar. Selecting a tab will change the information on the screen. See the mock-ups for more details.

For the majority of the year, the voting section will be greyed out. During the voting period, the voting tab will become available: this voting tab will be the same as the separate voting app.

The description for each of these components will be available in the Detailed Description section.

Use Cases

Clearly, the voting section will be used for determining school, house, and boarding prefects. However, the app may also be able to be tweaked to work for club committees, given that they also use a preferential voting system. Students/staff would need to be part of a club on Nexus for this to work.

The student/teacher app will be used on a daily basis, primarily to check the timetable, set homework / tests / deadlines / event reminders. Teachers can also use this app to remind them tasks such as marking tests, planning lessons and attending meetings.

Key Features

Functional Requirements

Feature Description	Research Needed & Why				
[Be brief]	[What you will you need to learn to implement each feature]				
Authenticate user	Check if user's email and password are valid CCGS email accounts				
	 Need to research email validation / Outlook Mail API / Microsoft 				
	Graph API				
Retrieve information about	Check details such as whether they are a student/staff, year group,				
user	house, if they are a boarding student, etc.				
	 Need to research how to retrieve information from local school 				
	database or the Microsoft GRAPH API (Office 365 Users, Groups				
	and Organisation data).				
	This is needed so that:				
	 The program can check which votes the user needs to cast, based on their house and whether they are a boarding student/teacher 				
	 Results can be grouped based on year level, etc. (necessary to 				
	check that the results are fair)				
	 Teacher votes are separated from student votes. 				
	Automated tallying can occur.				
User preferential voting.	Creating custom ReactJS forms.				
(i.e., choose up to six					
candidates in an order)					

Preferential vote result tallying	 Automated tallying, taking into consideration voting power of students/staff Export data as xlsx or csv.
Scheduling voting sessions	 How to only allow votes during set timeframes. How to differentiate updating past voting data or creating new data.

Non-Functional Requirements

Feature Description	Research Needed		
[Be brief]	[What you will you need to learn to implement each feature]		
Allows user to select less	Creating custom ReactJS forms.		
than six options			
Voting dashboard	Shows the votes which the user has yet to cast		
	Need to store whether a user has completed a certain vote		
Custom graphics	Creating nice art in Adobe Illustrator.		

Desirable Requirements

(Keep in mind that all aspects of the student/teacher app are classified as desirable, as they will only be implemented when the voting app is completed.)

Feature Description	Research Needed			
[Be brief]	[What you will you need to learn to implement each feature]			
Setup student/teacher app	Design – placing all elements in a concise, easy-to-use manner.			
	Linking pages.			
Display user's timetable	Nexus web scraping or school database access.			
automatically	Caching responses in the event Nexus goes down. (Like normal).			
Tasks/Diary	Storing user data in a custom database.			
	Server – User communication.			
	Scheduling emails as reminders.			
Campus map	Blender & ThreeJS: modelling the school, and drawing it in 3D			
	If possible, obtain user's location to show their location on the map			
Settings	Allow user to select certain settings, such as theme and notifications			

Design Considerations

[User interface – how will users interact with your app? Touch screen/use of buttons/keyboard etc]

Technical requirements

Requirement	Information			
[Input/output requirements – what information will need be needed]	 User information will be required A personalised dashboard for every student/staff member that uses it The timetable for every user Tasks that are added to the diary (to be synced across devices) Calendar entries are retrieved from our database (synced across devices) 			
[Hardware requirements – minimum device	 Client side Any device that has a web browser (i.e. chromium-based 			

specifications, other	browser, safari or equivalent)		
infrastructure required]	Server side		
	 A virtual machine with networking capabilities 		
	 Has access to existing infrastructure for client information 		
[Development requirements	Hardware/Software required for development/testing purposes		
software/hardware	 A laptop or desktop running Windows or macOS 		
required for development,	 A device without restrictions when starting the react app 		
infrastructure for testing]	 A device that can quickly deploy/run the react app 		
[User Input Methods	Optimised for web inputs		
	 I.e. Touch, cursor, keyboard 		

Development constraints

Requirement	Information
[Skills required]	 A solid understanding in the foundations of web development Understanding in ReactJS, HTML, JavaScript, CSS and JSX. Understanding in ExpressJS, API development, server scheduling and database management. OAuth 2 (Microsoft single-sign-in)
[Resourcing – what do you need to do the development]	 Information that is provided by past and future interviewees regarding app functionality I.e. How the voting system should work What functions must it do Etc. Access to online resources/documentation for development A thorough understanding of the schools infrastructure regarding student management.
[Access to required information] [Infrastructure requirements – eg access to servers, use of location services]	 Access to the synergetic database for certain user data Retrieving user timetables associated with the account User data such as profile images Access to our own database for other user data Diary information Access to Microsoft Azure for calendar syncing with email
[Ethical/legal issues – eg storage of personal information] [Possible Issues]	 Issues with user information being stored in a database Students/staff may be sceptical of the application since they would be required to upload data such as diary entries for tasks Possible security risk of data being leaked Accessing user data from the synergetic database may pose as a risk Information may be leaked from copying or deleted

Detailed Description

{Exactly what does the program do and what happens in different parts of the program.] [Screen by screen description of what is going to happen at each stage of the program. This should also include what will happen when particular buttons are pressed or an error occurs (e.g. suer enters incorrect password)]

The purpose of the program is to implement an integrated voting solution within the student/staff assistant app. The program will be split up into the following components:

UI Screen/Section	Description

Login	Sign in will be handled with Microsoft's single sign on system, meaning that once
	they have signed in via Microsoft on another application using this system, they will
	stay logged in on our app.
Dashboard	The dashboard will feature a screen that will display important information for the
	user, such as that day's timetable and tasks/assessments that are due. Other
	information such as the daily bulletin or notices will also be displayed.
Diary	The diary will allow the user to input tasks/assessments that will be saved and
	synced across their devices. It will also display the upcoming tasks/assessments that
	have been added and will be displayed in a list format.
Timetable	The timetable will retrieve the user's timetable from the school's synergetic
	database (or via web scraping) and display it. This will continue to function in the
	unlikely event of nexus being not operational, so that students/staff can still see
	what classes they have.
Campus Map	The campus map will provide an interactive 3D map of the school, so that the user
	can locate their classrooms with ease.
School	This tab will provide a page with links to documents such as the school's code of
information	conduct, school hymn, uniform expectations, etc. Each document will be opened
	and displayed as a pdf in a new tab.
Voting system	This tab will open the homepage of our voting system. This will show information on
	why and how to vote using this solution. It will also show the current votes that the
	user has yet to cast, and clicking on these will lead the user to the voting page where
	they can select candidates.
Options	The options page will display the settings that can be changed for the user. This may
	include the ability to:
	1. Change the theme
	2. Turn on notifications (system or email) for upcoming tasks/assessments
Login	The application should use Microsoft single sign in. If the user is logged out they will
	be greeted by the familiar Microsoft sign in website.

If an error occurs in the application, it will display a prompt to the user containing information on steps to resolve the issue.

We will also attempt to implement automatic error logging on both server and client devices.

UI Design

Will use elements of Microsoft fluent design accompanied by a flat material style. We will also adopt a light blue colour scheme with additional use of gradients.

Primary fonts to be used are:

- Bahnschrift
- Futura

We have also redesigned the CCGS logo to fit in with our colour scheme.

The mockups are available below.

Please see wireframe sketches in onenote.



Dashboard

Timetable

Settings

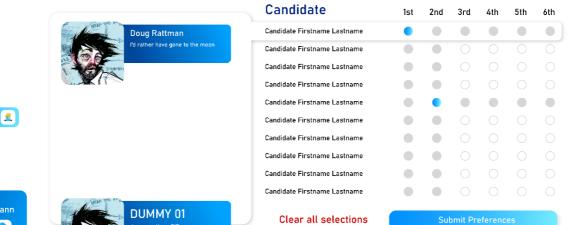
Campus map

School information

Diary

Voting

Please fill in your following preferences by clicking on the circles for each column.

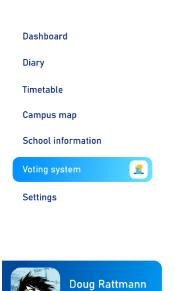






Voting

Please fill in your following preferences by clicking on the circles for each column.



Sign Out 😊

Candidate

Candidate Firstname Lastname

Clear all selections

Preferences

Preferences

				_		
1st	2nd	3rd	4th	5th	6th	

Submit Preferences



Dashboard

Diary

lacksquare

Timetable

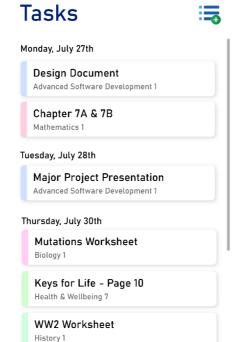
Campus map

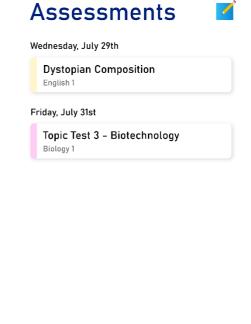
School information

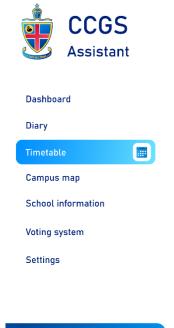
Voting system

Settings





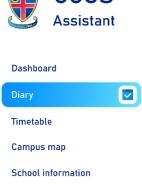


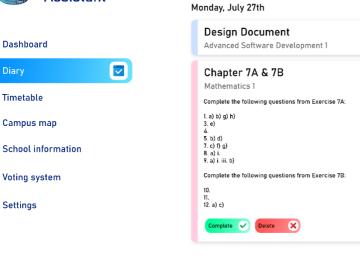


Doug Rattmann

Sign Out 🚭





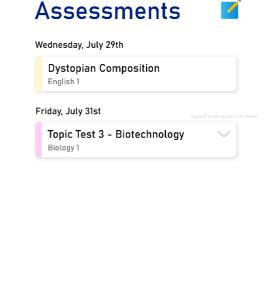


Tasks

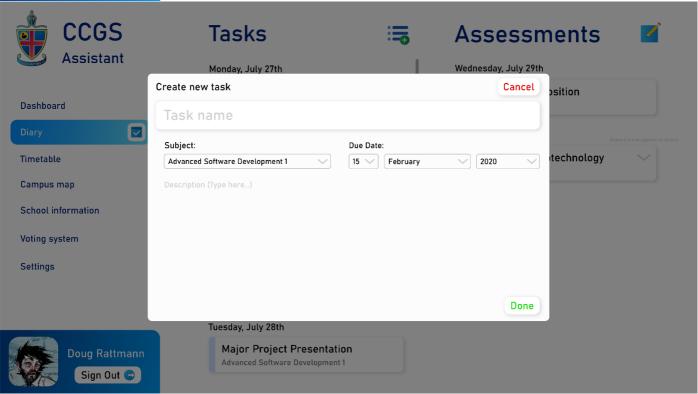
Tuesday, July 28th

Major Project Presentation

Advanced Software Development 1





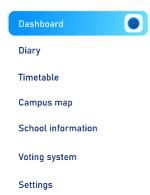




Dashboard
Diary
Timetable
Campus map
School information
Voting system
Settings



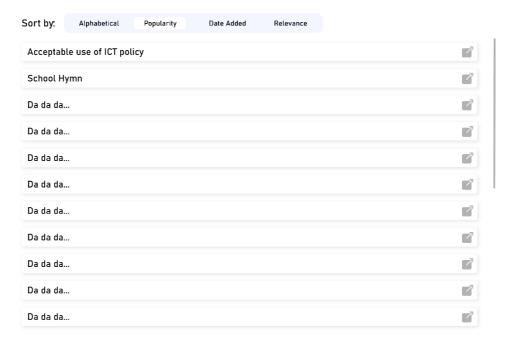




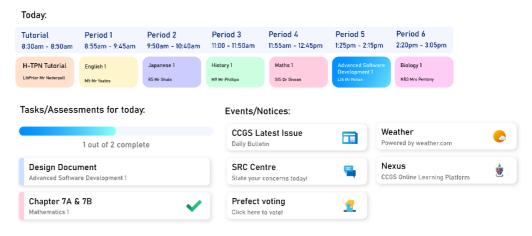


School Information

Here, you will find school documents such as the code of conduct, Acceptable use of ICT policy, etc.



Good Morning, Doug Rattmann.





Voting

Welcome to CCGS voting. Please see below for information on how and why to vote.

Dashboard

Diary

Timetable

Campus map

School information







Why to vote:

Voting at CCGS is vital in order to maintain the voice of the staff and student body. We strive to offer everyone an equal opportunity when choosing the correct leader.

How to vote:

This voting system is preferential, meaning that the person with the greatest amount of votes may not neccessarily be the winner. This means that you will be required to indicate your first, second, third, etc. preference for which candidate should be prefect. Please see below for an example.

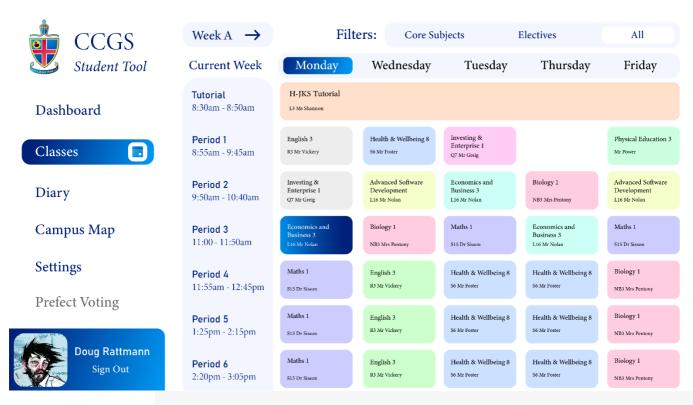
	Preference					
Candidate	1st	2nd	3rd	4th	5th	6th
Candidate 1						•
Candidate 2			•			
Candidate 3	•					
Candidate 4		•				
Candidate 5				•		
Candidate 6					•	

As you can see in this example, the voter has placed Candidate 3 as their first preference, and Candidate 1 as their last preference.

Milestones

Task	Estimated Completion Time
Understand school infrastructure	2 Weeks.
 How does CCGS store all its data? 	
 Which data would we get access to? 	
Which online services does CCGS use?	
 Do those services have an API? 	
Create server infrastructure	5 Weeks.
 Should be able to pull all necessary data. 	
 Should have automatic scheduling. 	
 Should have full error logging. 	
 Expose API endpoints for ReactJS application. 	

Complete ReactJS Preferential Voting UI	2 Weeks.
 Should separate nominees into categories based on their 	
potential positions.	
 Should clearly illustrate to the user how voting will work. 	
 Votes should be able to be updated after initial selection and 	
before the scheduled voting period ends.	
Complete ReactJS Fake Nexus UI	4 Weeks.
 Dashboard (Show upcoming diary tasks, todays classes and 	
important notices)	
 Classes (Scraped probably from Nexus) 	
 Diary (Tasks will be stored on local school servers) 	
 Campus Map (School will be modelled in Blender and rendered on 	
user devices using Three.JS)	
 Settings (Assorted settings like font, email reminders, etc.) 	
 Prefect Voting tab that will open a minimised version of the 	
above.	



CCGS Assistant.



Timetable



✓ Tasks

Good morning, John Appleseed







These were some exploratory designs that the team had put together, in order to experiment with colours and scale.