Project Report

ISYS20182 – Practical Project Management

Maya Rhoades N0901105
Aidan Thomson N0912074
Jak Waterfall N0906911
Mihir Adwani N0900246
Natasha Smith N0911632
Tugra Karakus N0912548
Alexis Gabrielle Foley N0902839

Abstract

There is an increased demand for applications that use augmentative and alternative communication. These demands are equally met with concerns of the reliability, support, and availability of these products (Baxter, et al. 2012). This report details a project that includes augmentative and alternative communication application, the concerns of AAC development, and the requirements of the client FlowerPod. FlowerPod is an organization focused on helping those with learning disabilities through gardening and socialization (Reach 2020).

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Introduction

1.1 – Background

The project is based upon the specific needs of Reach UK Flowerpod. Flowerpod is an organization that supports the development of people with learning disabilities through gardening activities. FlowerPod has many clients and limited resources; therefore, they need an application that can help their clients, save the staff time, is cheap to produce, and is most importantly focused on those with learning disabilities. The requested application is for a garden guide creator. This creator must include a way for staff to efficiently create gardening guides, a way to view the guides, support independent client use, be available on iPads, and match FlowerPod branding guidelines.

1.2 – Aim

The aim is to create a website that allows Flowerpod staff to create guides and list them for client viewing. Other aims include images, text tot speech, dictionary, and more.

1.3 – Objectives

The project has the following objectives to ensure client satisfaction:

- The design must match Flowerpod branding
- The application must be accessible on iPad.
- The application must be accessible to those with learning disabilities.
- The staff will be able to create guides in a template.
- Staff will be able to upload images as visual guides.
- Must be Augmented and Alternative Communicative
- The Guides must have text to speech

Survey of Existing Solutions

2.1 – Existing Products

The following table is a comparison of other augmentative and alternative communication application. It demonstrates their features, strengths, and weaknesses.

App	Features	Strengths	Weaknesses
First Then Visual Schedule HD	• Checklist • Images • Visual Support Creation • Editable templates • Timers	• User friendly • Disability Friendly • Visual Implementation • Several Viewing options	• Costly • Out of Date • Lacks more advanced features
DoKit	• Template Creation • Accounts • Feedback forms • Multilingual • Document Importation	• Large selection of templates • Large Scale • Variety of editable options	• Too advanced for simple use • Does not meet AAC guidelines • Is not app based • Costly
Mighty AAC	• Multiple Users • Visual Scenes • Task Lists • Independent learning sequences • Text to speech • Editable interaction details • Printable	• Printable • Used for a variety of tasks • Large scale • Editable features • Very AAC adaptable	• Very costly • Not simplified for organization needs.

2.2 – Demand for Product

The demand for AAC application is high and ever increasing. AAC allows those with disabilities to communicate in ways that would not be possible therefore developing independence and social skills. One survey suggests that 60 to 80 percent of AAC app users indicate an increase in well-being, mood, communication, and independence (Assistance Ware). This independence and development are exactly the goal of FlowerPod.

The other demand for the application is a garden guide creation system. Guide creation is not a new product. Almost everyone has used a creation system whether that be in word, making a cv, or even creating a checklist. Templates are constantly used every day, and their demand will never decrease. The demand of FlowerPod differs to other creation systems as it is a creation system that must consider the needs of those with learning disabilities.

2.3 – Company Information

Reach UK began in in 1999 as Southwell Care Project with only some parents and child with learning disabilities. Reach UK Flowerpod provides support across Nottinghamshire at 3 locations in Newark, Mansfield, and Southwell. Reach UK Flowerpod is part of the organizations way to raise funds and directly support local people with learning disabilities. The flowers grown on site are sold to support the organization directly. These flowers are grown through the time of a small staff, volunteers, and clients. The care of Flowerpod also supports ways of therapeutic development for the clients through skill and personal development. Flowerpod is a place for those with learning disabilities to relax and grow along with the flowers. Flowerpod provided these initial requests for the project and additional information shown below.

Initial Specification Requests:

-User friendly

-Images for visual explanation of steps

-Accessible on iPad

-Allow upload of image content from FlowerPod

-Meet Reach UK branding guidelines

Initial Meeting Requests:

-Text to Speech

-Video

-Accessible on other Devices

On Site Requests:

-Dictionary

Mid-point meeting Requests:

-Bank of images

-Multiple images on a slide and video

-Restrict access to website

-Direct upload image with camera

-Personable

2.4 – Software Required

Software required for the development of the website includes

-Visual studio 2022 with .net core packages

-Bootstrap framework

-SQL databases

-Text to speech libraries

-Programming languages (html, JavaScript, c#)

-Web hosting service if implemented

New Ideas

The idea of the project is to create a website that includes for staff a login area, guide creation template, image/ video upload capability, dictionary definitions creation. The users have viewable guides, visual step explanation, text to speech explanation of steps, viewing of dictionary, ease of use, and a list of guides to view. Additional usage will be offline functionality and downable guides. Requirements are as follows:

Functional Requirements	Description	Task
FR1: Guide creation	Flowerpod staff can create how to guides for service users to follow.	T1.1: Create how to guide template T1.2: Store guide in database
FR2: images/Video	When creating a guide staff must be able to add multiple images or video.	T2.1: Allow image upload T2.2: Allow video upload
FR3: Guide List	A list of guides is available to display	T3.1: Create guide list function
FR4: Allows Printable	Allows users to print off the guides on regular A4 paper	T4.1: Create print function of templates in PDF format
FR5: Staff Login	Allows only staff with correct credentials to access the template creator.	T5.1: Create login system T5.2: Create Admin area
FR6: Offline use	Allow users to view how-to-guides while not connected to the internet.	T6.1: Create Offline Service Worker
FR7: Text to Speech	All tasks should have a text to speech function to be more adaptive to AAC.	T7.1: Implement Text to Speech T7.2: Implement picking of voices
FR8: Dictionary	Allow staff to add words and definitions to a dictionary	T8.1: View dictionary T8.2: Add to dictionary function

NF-Requirements	Description	Tasks
iPad accessibility	The service must be accessible on iPad.	NF1: Target iPad application
Flowerpod branding	The service must adhere to the Flowerpod branding guidelines.	NF2: Meet branding guidelines

Internet accessibility	Service must be available over the internet.	NF4: Allow frequent updates to all iPads

Design and Development

4.1 - Concept map

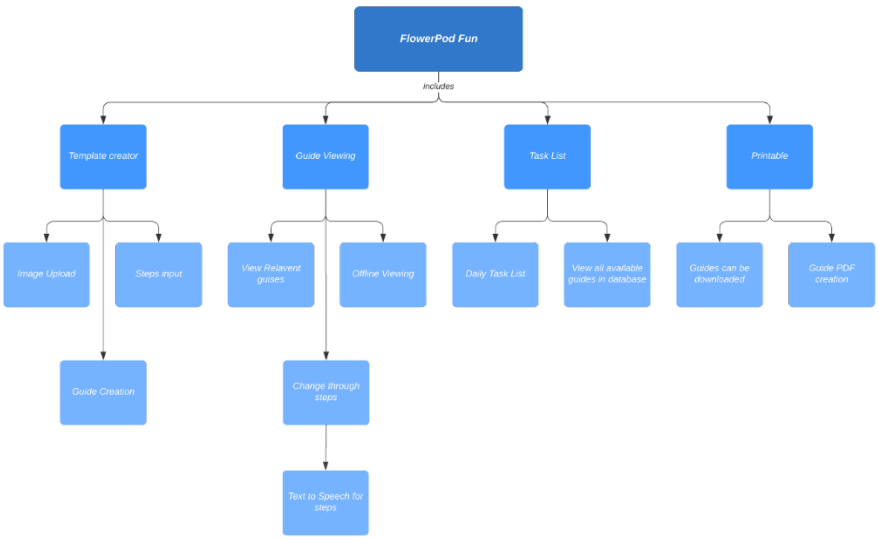

Figure 1 Concept Map

The first stage of designing was settling on the layout and features of the website. The concept map above shows the initial features and abilities of the site.

4.2 – ERD

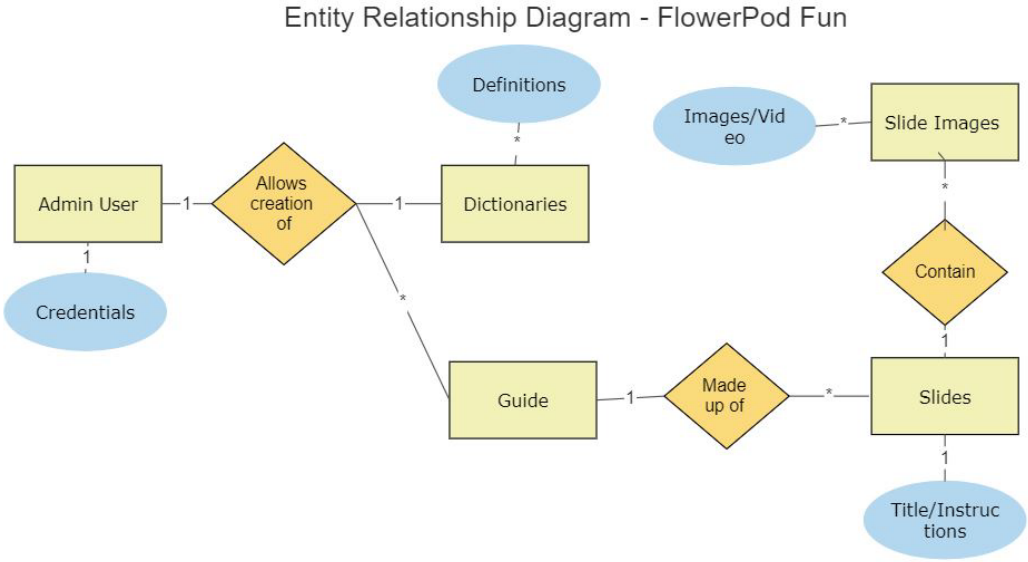

Figure 2 Entity Relationship Diagram

The ERD (entity relationship diagram) pictured above shows the relationship of objects withing our system. It depicts the relation of tables within the database. The database contains important tables

such as Admin User, dictionaries, Guide, Slides, and Slide Images. The diagram also shows the relations between the tables with the relationships in the yellow diamond. The multiplicity of the relationship is shown in the lines such as the relationship from guide to slides is every one guide is made up of multiple slides.

4.3 – Use Case Analysis

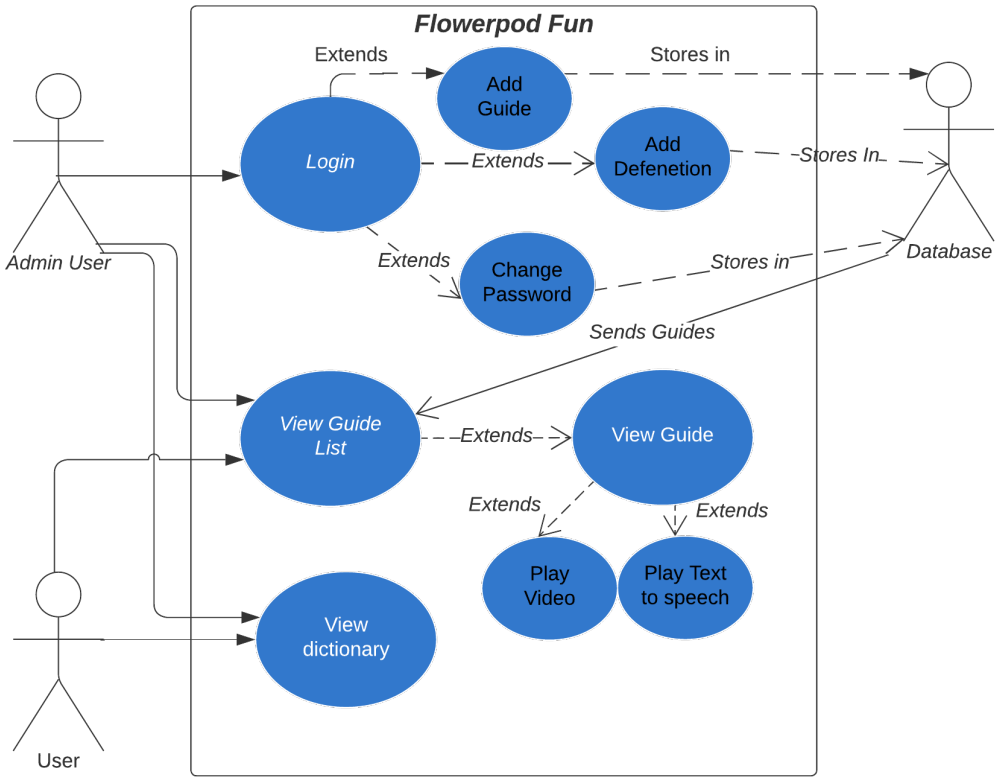

Figure 3 Use Case Diagram

The Use Case diagram shown about shows the main functions of the project. The Login use case allows the admin user to login and if logged in they can add a guide, add a definition, or change their password. Other users can view a list of guides, select a guide to view, and then play video or text to speech within that guide. Finally, the users can also view a dictionary. The use case also shows a database that is used to store and send information. This is a simple use case to display the requested functions with no addition trivial steps.

4.4 – DFDs

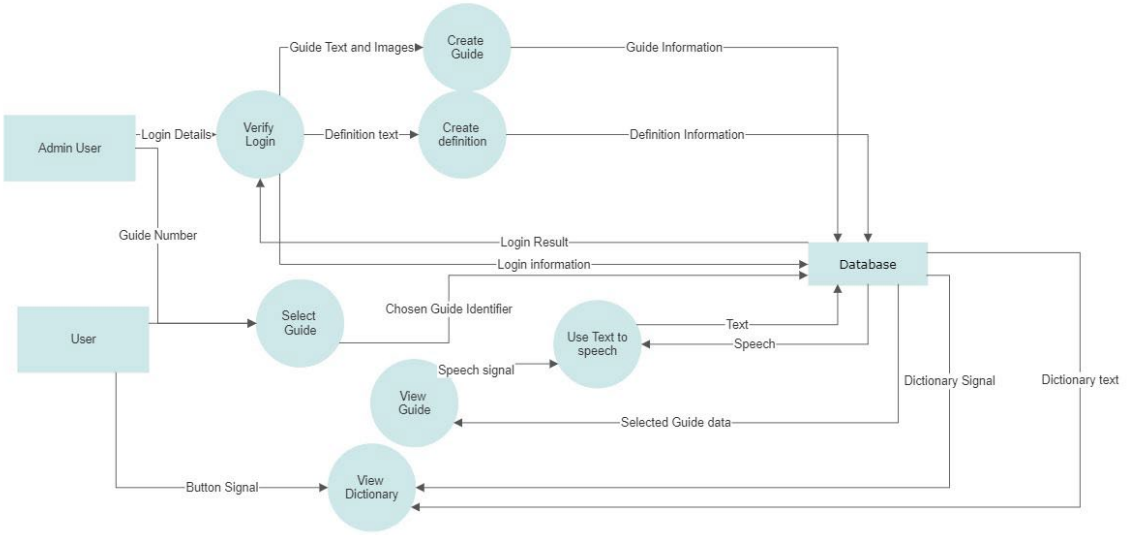

Figure 4 Data Flow Diagram

The above diagram is a Data Flow Diagram. It displays the flow of data and processes represented in the system. The diagram shows the cycle of data as the user goes through various processes. It begins for the admin user when they enter their login details. This information is sent to the database. The result of the credentials is then sent back and if valid allows the user two additional processes to be able to use. These two additional processes are about adding information given by the admin to the database in the form of a guide or definition. The User and Admin user have a process called Select Guide. This process lets the use click on a guide to view and sends the identifier for the guide to the database. The corresponding information for the guide it then sent back for the user's viewing. Once viewing a guide, the user can use text to speech. When the text to speech process is ran, the text is sent to the database with the corresponding speech sent back to be played for the user. A similar process to view guide occurs from view dictionary. That is the complete data cycle of the project.

4.5 – Page Linking

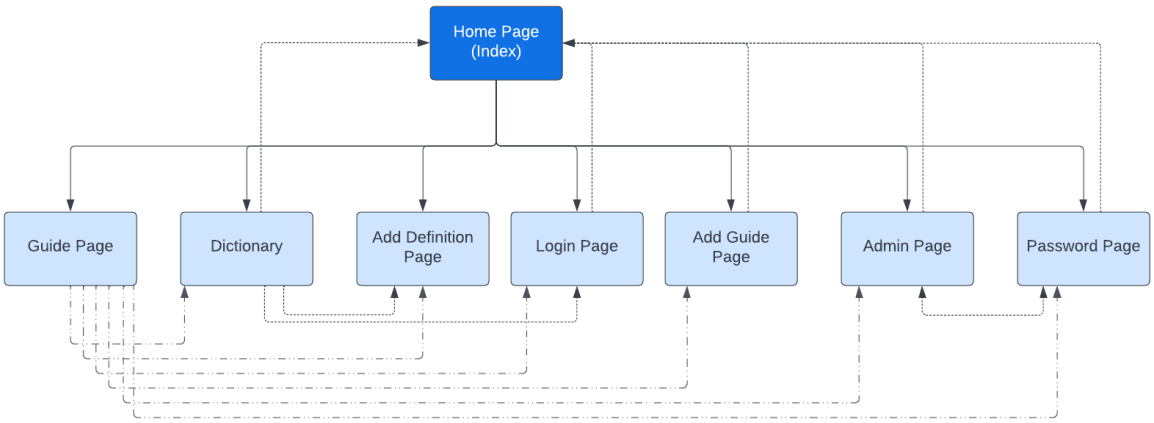

Figure 5 Web Page Linking Diagram

The above diagram shows the structure of the website. Each box represents a page within the website. Each arrow and line represent the way users can navigate between pages. For example the user can travel from the Home Page to the login page and back. But from the login page they can only return to the home page.

4.6 – Database Structure

A database is an important component of the project, as the application revolves around building and distributing numerous guides to Flower Pods service users. It was agreed that a database driven application was needed to accomplish this feature.

Any dynamically created data that a user can create must be stored and be easily retrievable from a database. For example, it must store all the data that comprises a guide, such as instructions, slide images and meta data (estimated duration and time of season). An admin account must be held in a table to allow a user to login from any devise and the information provided by users to the dictionary feature must also be available anywhere and so must be kept in a table in the database.

For this project the Entity Framework database that is provided in the ASP.NET core framework will be used to create, read, update and delete records from a database stored locally on the server. This framework provides an easy-to-use API that allows a developer to write a code first solution in the C# programming language.

```
Guides = context.Guides.ToList();
Guide = context.Guides.Include(s => s.Slides).ThenInclude(i => i.SlideImages).SingleOrDefault(e => e.Id == Id);
```

Figure 6 Retrieving Guide Code

In this example code snippet, the first line shows how one would retrieve every guide record currently held in the database as a C# List data structure. This really displays the power of the framework by encapsulating down a complex task into a single line. The second line demonstrates how one would retrieve a single record from the database including all related slide images based on a given unique identifier (the Id).

The Identity framework provided by ASP.NET supplies a built-in solution to user accounts that integrates directly into the Entity Framework database. The Identity framework will be used as the base class for the admin user to hold all their meta data (email addresses, passwords).

```
var User = new IdentityUser
{
    Id = "873d6c80-2c60-4ad6-97bd-a79e576d76c3",
    UserName = "Admin@Admin.com",
    NormalizedUserName = "Admin@Admin.com".ToUpper(),
    Email = "Admin@Admin.com",
    NormalizedEmail = "Admin@Admin.com".ToUpper(),
    EmailConfirmed = true
};
var PasswordHash = hasher.HashPassword(User, "Password1@");
User.PasswordHash = PasswordHash;
```

Figure 7 Admin User Code

This code snippet shows the admin user being instantiated and placed into the database when the database is first created with a username, email and a default password that is hashed for security.

There are 5 main tables created in the database to store all the information needed to serve the application. First for the guides system the main table “Guides” is used for the top-level information on each guide.

	Name	Data Type	Allow Nulls
🔑	Id	int	☐
	Title	nvarchar(20)	☐
	EstimatedDuration	int	☐
	CreatedAt	datetime2(7)	☐
	Season	nvarchar(6)	☐
	ThumbnailImagePath	nvarchar(MAX)	☑

Figure 9 Guide Table

Each record has a primary key “Id”, a title of the guide, an estimated duration that the guide takes to complete, when the guide was created, which season the guide is most useful in

	Name	Data Type	Allow Nulls
🔑	Id	int	☐
	SlideIndex	int	☐
	Title	nvarchar(200)	☐
	Instruction	nvarchar(200)	☐
	GuideId	int	☑

Figure 8 Slide Table

and a file path the thumbnail image of the guide used in the sidebar menu. The next level down, the table “Slides” is used to store meta data on each slide in a single guide.

Each record of this table contains a primary key “Id”, the index value of each slide to store what order they should be displayed in, the title of the slide, the instruction on the slide and a foreign key “GuideId” which points back to the “Guides” table to link which slides belong to a certain guide in a many-to-one relationship.

The last table in the guides system is the “SlideImages” table which his used to store all the images of each slide. The system allows for multiple images to be uploaded for each slide to create a collage of images for each step of the guide.

	Name	Data Type	Allow Nulls
🔑	Id	int	☐
	ImagePath	nvarchar(MAX)	☑
	ColWidth	nvarchar(20)	☐
	SlideId	int	☑
	isAVideo	bit	☐

Figure 10 Slide Images Table

Each record of this table also contains a primary key “Id”, a file path to the image uploaded, the column width of the image so that images may be stacked together in different arrangements such as 4 images together in a line or a two-by-two grid combination of images. A bit set is used as a Boolean value to indicate if the media used in the slide is a video or image and a foreign key “SlideId” is used to point to the “Slides” table to link each image to a slide in a one-to-many relationship. The dictionary system uses one table to store all its data.

	Name	Data Type
🔑	Id	int
	Word	nvarchar(50)
	Defintion	nvarchar(500)

Figure 11 Dictionary Table

A word and definition combo are stored along with a corresponding primary key which his

	Name	Data Type
🔑	Id	nvarchar(450)
	UserName	nvarchar(256)
	NormalizedUserName	nvarchar(256)
	Email	nvarchar(256)
	NormalizedEmail	nvarchar(256)
	EmailConfirmed	bit
	PasswordHash	nvarchar(MAX)

Figure 12 User Table

used to retrieve the record from the database. For the admin account, only a single record is stored into the table “AspNetUsers”.

This table contains a primary key “Id”, a username and normalised username combo which is just the username in all capital letters, an email address with a normalised version, a bit set to hold if the email address has been verified by the user and the hashed password. The

password hash is used to test if the user inputted the correct password on login and well as for security purposes as if the database was to be attacked, the malicious user would only gain access to the hashed version of the password.

4.7 –Development Issues

The development of the project began smoothly but declined in speed as the project progressed. While most areas of the project were completed some issues did arise. The text to speech function ran into an issue as when pulling text to speech libraries from the device the program is running on there was a large quantity of voices. This issue was resolved by choosing to only display the first four English voices. Another issue that was repaired was navigation between pages of the site was causing sql errors. This issue was found to be a problem of improper merging and was soon fixed. Of the implemented features no other lasting issues occurred.

Two issues occurred of which could not be properly fixed during development. The first was trying to implement offline capability for the website. This would allow the user to use the website without being connected to mobile data or internet. The offline function was planned to be implemented using a tool called a service worker which simply stores the site data in local cache. The issue arose when it was discovered the site would still need database access. When trying to figure out a way to take the database offline as well it was found that due to the type of database being used it would not be possible. The second unsolved issued was found when trying to implement a printable guide. This printable guide was intended to be a downloadable PDF containing all the information for the guides. While it is possible to go from html to a pdf the issue that caused this not to be implemented is the carousel on the site. The carousel is the slide show like object that allows users to see only one step of the guide at a time. The carousel implemented a more user and AAC (augmentative and alternative communication) friendly application and therefore the printable was deemed not required as to preserve it.

A team member issue did occur during the project. With less than a month left to completion a team member withdrew from the program and left their part of the project incomplete. This was resolved by passing their section off to two other team members.

4.8 – Final Design Screens

The final design of the project is the first design of the project as well. The colours, font, and layout were determined at the beginning of the project. Below is several pages from the final website and a description of the choices in the design.

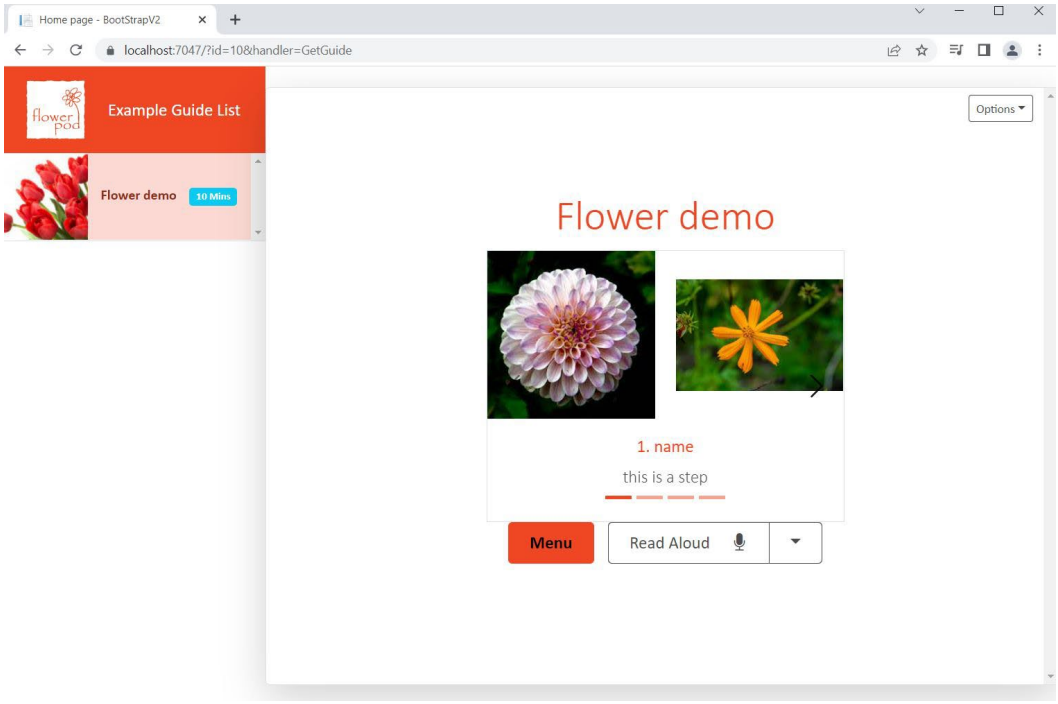

Figure 13 Home Page design

The home page is the page seen when the website is first loaded. It was decided the home page should feature a list of guides on the left and the guide on the right. It is a simplistic and uncluttered design to cater towards those with learning disabilities by only giving them what they need. The colours and font for the site is to match the branding of Reach UK FlowerPod. Visual Elements are shown to help with understanding for those with learning disabilities. The Guide section on the right is a carousel (like a slide show) that allows the user to either slide or click to go to the next page of the guide. This makes viewing guides very intuitive and simple.

<u>Why we chose the estimated duration of a task (and season) rather than easy, medium and hard:</u>

There is a debate whether teaching should label people's ability to learn. On the one hand, no matter the term used (in this case the labelling system: easy, medium, hard), it will inherently have or develop positive or negative connotations (Boyle, 2013). In this case, having the labelling system and traffic light colour scheme based off someone's learning abilities may lead to someone's negative perception of their own ability.

However, we could categorise activities by complexity by adding a feature that indicates how much time a task could take. In addition to this, we could have a category to suggest what type of weather the task can be performed in.

<u>Why we chose the colours for the different seasons/ task durations:</u>

Smallman & Boynton (1993) concluded in their article that 'colours segregate well because they are well separated from one another in three-dimensional subjective colour space'. This meant that if we chose colours that were well separated on the colour wheel, the categories with different colours would be easily distinguishable.

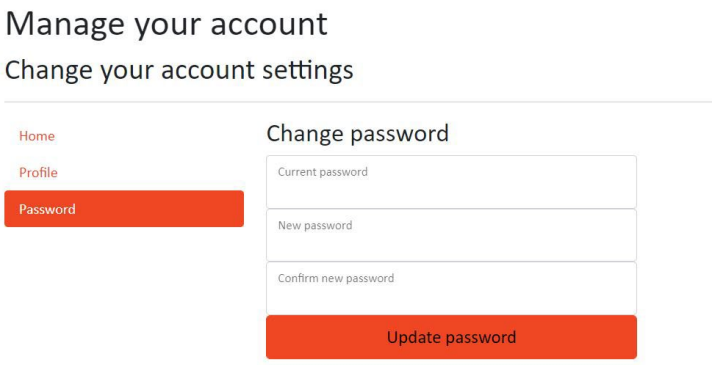

Figure 14 Admin Page Design

The admin page is an area only accessed by logged in admins. It allows the admin to change password or update their profile.

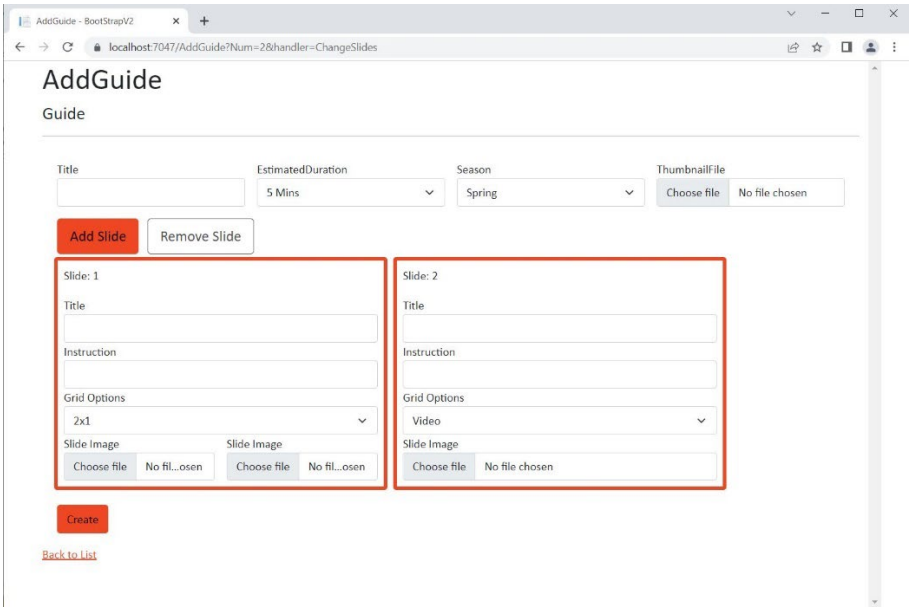

Figure 15 Add Guide Page Design

The Add guide page is the most complicated page in the site. It is a template for guide creation. The template includes a title, estimated duration, season, and thumbnail. It also contains slides for steps. The user can add as many slides as they would like. Each slide is a step in the guide containing a title, instruction, grid option, and upload options. The grid option allows the user to display images or video. If they choose an image grid the user can add images in a 1 by 1, 2 by 3, 2 by 2, or more layout grid. It then adds the corresponding amount of upload button at the bottom of the slide so the users can choose where to put each picture in the grid.

T

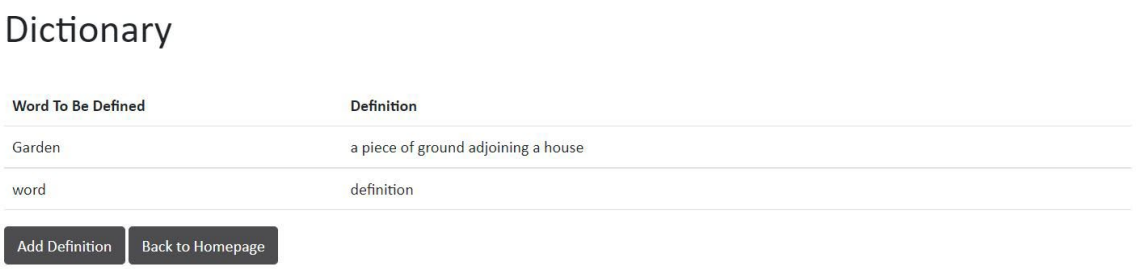

Figure 16 Dictionary Page Design

The Dictionary Page contains a simple list of words and their definitions. It contains no other features as to minimize distracts.

4.9 – Code Design

Text-to-speech

To implement the text-to-speech element of the project there were a few stages that it went through. First was adding the "Read Aloud" button and then having the text read aloud by the computer, which was implemented by using the speechSynthesis interface of the Web Speech API in JavaScript.

Then, it was decided to try and make it possible for the user to select the voice they wanted to read the text aloud in. The first part of this was creating a dropdown menu next to the "Read Aloud" button that had radio buttons, of which one could be selected to determine the voice of the utterance. To do this, the getVoices() function was used, but there was an issue that arose when first trying to use this function. The problem was that the getVoices() function would add the voices into the array asynchronously, meaning when the voices array was next accessed, it appeared empty. To solve this problem, it was decided to use a Promise that would wait until the voices array was populated.

The second part of having a selectable voice that would read aloud the text was to check if there was a specific voice selected. If there was, the voice that was selected would be found and used for the utterance, and if not, then the default voice was used.

4.10 – Version Changes

Version Number	Additions/Changes
0.1	• Bootstrap guide
0.2	• Changed to branding (colours, font, font size) • Added Login function • Added Offline Capability test • Changed difficulty colours • Added Basic Template • Added Download button • Added Alternating colours in guide list • Added coloured header box • Added Mic symbol • Added Options Button • Added Menu Button • Added Alternating guide background

	• Responsiveness
0.2	• Text to Speech reads out • Added guides database connection • Download button added
0.3	• Working Text to Speech • Dictionary added • Added admin area • Voice options added
1.0	• Removed Registration • Removed download button • Added home button in login page • Changed estimate time intervals

4.11 – Project Management

Management of the project was oden in several ways using GitHub, Trello, Meeting Minutes, Microsoft teams, and WhatsApp.

GitHub – was used to store any code. Each addition to the code was to be uploaded and merged once approved by the other members. This ensures previous version of the code are available id anything should happen to break the code.

Trello – was used to track weekly tasks. Each member was given a task weekly to complete. Each task was then tracked to track member contributions.

Meeting Minutes- Meetings were conducted with a large meeting every Friday of the project, Supervisor meeting on Mondays, and daily check in meeting every Tuesday, Wednesday, and Thursday. These meeting kept track of tasks and changes in the development. Noted in Appendices A.

Microsoft Teams – was used to host meeting, give team updates, and store any relevant documentation.

WhatsApp – was used to gain help of other team members on difficult tasks when necessary and as well as keeping everyone informed of meeting changes.

Evaluation of Project

5.1 – Customer Feedback

Sam Ward the head of horticulture ate FlowerPod reviewed our application. Overall feedback was that it was an excellent application that really takes in the needs of his clients. It is easy to use and has many helpful features. Other feedback included the questioning of further work with the project. Mr. Ward indicated he would like the application to include a bank of images, restriction of use of the website, printable guides, live implementation of the site, images for dictionary, text to speech for dictionary, and pop ups for definitions.

5.2 – Objectives

The design must match Flowerpod branding

The application matches FlowerPod branding. It includes the FlowerPod logo, font (Calibri no smaller than 11 pt.), Colours (Orange # ef4623, Gray # 4d4d4f), and spacing (simple design).

The application must be accessible on iPad.

The application is accessible on iPads and other devices. The objective was only for iPad, but it had the potential to be more accessible with other devices as well.

The application must be accessible to those with learning disabilities.

The application implements AAC needs. The application meets visual needs with the displaying of images and videos. The application matches auditory needs with text to speech function. The application assists with understanding with the use of a dictionary. It is also simple to use. Other means to support AAC are the estimated time durations. These time durations are used to gauge the skills of the guides without using the words easy, medium, hard as these words can be off-putting to those with disabilities. Additionally, when displaying the times on the guide list the use of more neutral colours is used to make sure the user is not deterred by potentially negative colours such as red.

The staff will be able to create guides in a template.

The Staff can create guides by logging in and navigating to the add guide page. This page allows the addition of slide tiles for the number of steps the user wants in the guide. Each slide (step) can have a title, instruction, images in a grid or a video. The image grids are available via a dropdown allowing for different grids of images on each slide. The template also allows a title for the guide, an estimated duration assignment, a season assignment, and a thumbnail.

Staff will be able to upload images as visual guides.

The Staff can upload images and video to display in the guides as mentioned in the above section.

The Guides must have text to speech

The guides have implemented text to speech. The text to speech function will read out what the title and instruction on the current slide is. The user can also choose from several different voices in the drop-down menu to use.

5.3 – Requirements

Below is the list of requirements and the result of said requirements:

Functional Requirements	Description	Task	Result
FR1: Guide creation	Flowerpod staff can create how to guides for service users to follow.	T1.1: Create how to guide template T1.2: Store guide in database	Completed Completed
FR2: images/Video	When creating a guide staff must be able to add multiple images or video.	T2.1: Allow image upload T2.2: Allow video upload	Completed Completed
FR3: Guide List	A list of guides is available to display	T3.1: Create guide list function	Completed
FR4: Allows Printable	Allows users to print off the guides on regular A4 paper	T4.1: Create print function of templates in PDF format	Failed to implement

FR5: Staff Login	Allows only staff with correct credentials to access the template creator.	T5.1: Create login system T5.2: Create Admin area	Completed Completed
FR6: Offline use	Allow users to view how-to-guides while not connected to the internet.	T6.1: Create Offline Service Worker	Failed to implement
FR7: Text to Speech	All tasks should have a text to speech function to be more adaptive to AAC.	T7.1: Implement Text to Speech T7.2: Implement picking of voices	Completed Completed
FR8: Dictionary	Allow staff to add words and definitions to a dictionary	T8.1: View dictionary T8.2: Add to dictionary function	Completed Completed

NF-Requirements	Description	Tasks	Result
iPad accessibility	The service must be accessible on iPad.	NF1: Target iPad application	Completed
Flowerpod branding	The service must adhere to the Flowerpod branding guidelines.	NF2: Meet branding guidelines	Completed
Internet accessibility	Service must be available over the internet.	NF4: Allow frequent updates to all iPads	Completed

Discussion/Conclusion

In conclusion the project achieved a well-designed functional website that can be implemented with FlowerPod. The website contains a guide creation, dictionary, viewable guides, images upload, video upload, text to speech, admin settings, and a user-friendly navigation. The only thing that remains to be done from the initial requirements is offline capability and printable guides. The remaining abilities can be added into future work. Future work for the project will include a bank of images, restriction of use of the website, printable guides, live implementation of the site, images for dictionary, text to speech for dictionary, and pop ups for definitions. All these implementations will be implemented to further the use of the website for FlowerPod. The technology used during this project allowed development of valuable skills while also showing the limits of the technology. Due to what technology is used it is not always possible to implement everything that was planned in the beginning. It requires adaptation and experimentation to find the best way forward for the tech's intended use. This project adapted into an application that can be used to improve the wonderful work done by Reach UK FlowerPod.

Professional, social, ethical, and legal issues

In affiliation with the public, the group members have possessed and composed some concerns to maintain the principles and confidentiality throughout the development of the project. The group has also considered the professional, social, ethical, and legal issues to carry on with the expansion of the project. To minimize the chances of these risks, they have been analyzed. When the professional issues had been investigated, the British Computer Society's (BCS) code of conduct had been evaluated. The BCS code of conduct sets out the professional standards that are required by BCS, which applies to all the members of the group, regardless of their grade, or their role. The group also decided to refer to BCS Codes of Conduct and Practice (Chapter4. Code of Ethics and Professional Conduct), published by Computer Science Department, University of Cape Town.

Professional

Members shall act in a manner that is in their professional capacity and avoid engaging in any activity that is incompatible with their professional status. They shall promote ethical behaviour and develop effective communication skills to counter misleading and false statements made by others. Members should promote and support fellow professionals in their professional development. They must act in a manner that is in their professional capacity and avoid engaging in any activity that is incompatible with their professional status.

The creation of the product was made with the sole objective of making it available to all members of the public. In terms of the group, it was our priority that every member's opinion was taken into consideration and listened fairly when creating the product.

Social

When considering the social issues in this project, it had to be analysed that the project supports learning disabilities in adults had to be taken into consideration. As learning disability is a major part of this project, it must be kept in mind that it doesn't harm an individual or the user. If it does, it would breach the BCS code of conduct as it would affect one's health. To avoid this, the group will work carefully taking this into consideration that it must not affect the user.

Ethical

For ethical issues surrounding this project, the group had ensured that all the issues must be considered and acted upon accordingly. One of the ethical issues is that it must not discriminate amongst people and treat everyone equally. This means that if a person can't grasp things after a several attempts, he/she must not be treated in an exceptional manner and give them time to gather it. If the user believes that he/she is feeling unsafe or not finding it useful using the product, then they can stop using the product if they wish to.

Legal

When taking legal issues into consideration regarding this project, the group agreed to consider analysing all the issues faced within this part. One of the key legal issues relating to the product is that the user data must be confidential and must comply with the BCS Code of Conduct and the Data Protection Act as well. This means that the data must not be leaked in the sense that no other user can see another user's data and vice versa. A common way of avoiding the breach of Data Protection Act is by making sure what data is provided by the user and ensuring the consent is provided from the to collect the data from the product. The same goes when the user log in to the web interface

via username and password. This prevents unauthorised access to the members of the public from accessing the data that has been collected.

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Appendix A – Meeting Minutes

Meeting Minutes can be found in the same folder as this report.