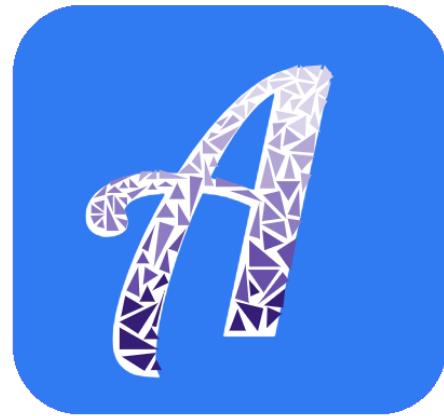


Attainable Project Book

“Enabling independence, Empowering lives”



Team

Anna Farragher
&
Theres Devassy

School

Mount St Michael Secondary School, Claremorris, Co. Mayo.



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Meet the Team

We are Theres Devassy and Anna Farragher and this is our team, CtrlAltFix.



Anna Farragher

Hi, My name is Anna. I am 16 years old and a Transition Year student at Mount Saint Michael's Secondary School. I developed the home page, login and signup pages, the link to organizations , the calming music page ,the to do list and the personal profile.

Theres Devassy

Hi, I'm Theres. I am 15 and a Transition Year student at Mount St Michael Secondary School. I assisted in the development of the app and was very involved in the writing of the business plan and project book. I programmed the Text to Speech feature, Calculator, Planner, and Medication Tracker.

Summary/Abstract

15 percent of the world's population have a disability, 200 million of that percentage have an intellectual disability. Our project is an application which we have decided to name Attainable that is aimed at adults with intellectual disabilities and assists them in living a more independent lifestyle. An intellectual disability is a disability that limits intellectual functioning eg reasoning, learning, problem-solving and adaptive behaviour, which covers a range of everyday skills, an example of an intellectual disability is down syndrome. This word can also be used as an umbrella term for learning disabilities and developmental disabilities

The reason we are developing this application is that resources especially applications supporting people with intellectual disabilities and how close to none are for adults. The unsuitability of technology and user interfaces for people with an intellectual disability is another issue we are tackling with our app. Our application is designed to deliver multiple resources and info in a way that is tailored to assist adults who have an intellectual disability. Furthermore, we have built Attainable to help our users become more independent as we have found that only 29 percent of people with an intellectual disability are employed.

From a research article done in April, 2018 which studies the changes in independence for daily living from using assistive technology for people with intellectual disabilities, there is evidence that reliance on support workers gradually faded and technology continued to provide support when participants involved in the study were supported with technology. This study proves that independence can be increased through using technology and supports our methodology in solving our issue. Another study shows that only 10 percent of those who require assistive technology have access to them which is why our application is easy to access it can be downloaded by potential users on their personal devices

Attainable allows users to use their phones in a simplified way. We have 8 features in our app which have all been chosen with the inputs of healthcare professionals. Calculator to aid with maths. A To-do list to keep track of everyday activities and to motivate the user to accomplish small goals every day. A Planner for weekly events in their lives. Links to different charity organizations that can aid the user if necessary or for the user to volunteer. A Personal Profile that contains information about the user (eg. likes\dislikes, actions that can make them uncomfortable, etc) can be used when meeting

a new individual. A Text to Speech feature to help non-verbal users to communicate. A Medical Tracker to keep track of medication intake and remind users to take their medication on time. A calming section to help the user unwind\calm down in an overwhelming situation.

Our app has been built on the MIT App Inventor, we chose this platform due to our experience and familiarity with it. Mit App Inventor is easy to navigate and utilises visual code. In the future, we plan on updating and rebuilding Attainable on a more advanced platform such as Android Studio.

We have developed Attainable to have a user-friendly interface optimized for adults with an intellectual disability. We have used bold letters, contrasting colors, simple fonts (Arial), and plenty of visuals. Our reasoning for this being according to a study which researched the impacts of visuals and their application to websites designed for the use of people with disabilities, we discovered that bold colours, colours that are more calming such as blue and purple and simple fonts make sure any individual using our app will be able to access all parts of our application. We are confident that this app will help adults with intellectual disabilities to live a more independent lifestyle.

Introduction

Through observing people close to us who have disabilities, we concluded that there was a lack of resources for them and planned on assisting them through the development of an app that would help make their lives easier. After brainstorming ideas and interviewing multiple medical professionals, we decided to focus our app idea on helping people with disabilities become more independent. To help us further validate our idea we sought out a professional opinion from someone who works closely with the community.

We decided on this idea specifically as we both have close connections with people who have a disability and because of this, we are aware of how unfair it can be for someone with an intellectual disability to live in a world that disregards some of your basic needs or makes public facilities inaccessible or difficult to use. We wanted to help our users become more independent.

There are many resources for children with an intellectual disability provided by schools and the government which is why we wanted to focus our application on adults who have an intellectual disability. We wanted to help our users become more independent as we read a study done by the Center for Social Development and Education at the University of Massachusetts Boston and we discovered that 34 percent of adults with intellectual disabilities are unemployed. We feel that there is a huge lack of resources available for those who have disabilities in general.

To understand the needs of our target demographic, we conducted a survey by reaching out to organizations that worked with people with disabilities such as Western Care and The Brothers of Charity. We also wanted to know how a professional who has experience in the field felt about our idea and so we interviewed two healthcare professionals who worked in our local community.

We hoped with the development of our app that those who have an intellectual disability have more resources that can assist them in their lives and increase independence as well as have an app which has a wide variety of features to assist with inconveniences they face almost every day.

Background Research

We have looked at the results for Census, 2016 done by the CSO which researched health, disability and carers. We've also done field research on play store and the app store to see if there were similar products to ours. We have looked at psychology articles which research colours and visuals that work best for people with intellectual disabilities as well as interviews which talk to people with disabilities and discuss their difficulties in day to day life. We have also interviewed two healthcare professionals in our local community.

We contacted two healthcare professionals that worked in our local area and interviewed them to learn more about our target demographic as well as to validate our idea from a professional. We learnt much more about the problem we were attempting to solve as well as a rough idea of what our application should have. The following is an outline of information we gained from interviewing both professionals.

- Many pre existing apps are not user-friendly
- Many are not catered towards the needs of people with an intellectual disability
- Apps that solve specific problems can be very useful but when it comes to daily use it would not be very efficient or effective as the user would have to download separate apps for each issue they face in their daily lives if there is a corresponding application for it which could make finding the correct app for the correct situation stressful and inefficient especially in a overwhelming situation.
- It is difficult for people with intellectual disabilities to engage in activities in daily living compared to a neurotypical person for example taking a shower would, in theory, be understood by a neurodivergent person but difficulty occurs when it comes to initiating and physically carrying out the steps involved in a certain task
- An app like ours would definitely benefit people with disabilities and our app idea is unique/ not been seen before.
- Planning and communication are areas an application could assist with as well as decrease dependency on a support worker and increase independence.

This is the research we have conducted on apps similar to ours in the market. We have looked at reviews and asked professionals on their onions of said apps.

Name	Attainable	Abilipad	Ostimo	Choiceworks	Stepping Stones	Proloquo2Go
Platform	Android	iOS	Android\ iOS	iOS	iOS	iOS
Description	Helps adults with intellectual disability	Customizable keyboard with text to speech feature	Helps children with autism learn through games	Allows children to create a visual schedule using their own photos, videos and audio recordings.	Allows caregivers to set up routines easy for those with developmental disabilities to follow.	Communication through words and images
Cost	3 euro	18 euro	Free, has in-app purchases	10 euro	99c	230 euros with in app purchases
Positives	No direct competitors, 8 features, simple user interface	Word prediction, customizable	Customizable, bold colours	5 stars on the app store, multiple features, lots of visuals and images	Uses visuals and images, simple user interface,	Many visuals and images
Negatives	Currently not available on iOS	iOS only, Limited features	Many apps out there similar to ostimo eg MITA, Autism only	iOS only	iOS only	Expensive, iOS only, Limited features

Proloquo2Go, Choiceworks and Abilipad assist with lifestyle inconveniences but they only have one or two features thus a person with intellectual disability would have to download multiple apps for different situations which would make it difficult for the user to find the right app at the right time. Our app Attainable will solve that problem with its total of eight features. They were created taking into consideration the comments and observations of health care professionals. Many of our competitors aim to assist people with a specific intellectual disability, whereas Attainable tries to help everyone as it's possible to have multiple intellectual disabilities.

The Abilipad has a text to speech feature which was seen to be very useful from observing the reviews in the app store and which is one of the reasons why we decided Attainable should have a text to speech feature. A planning feature was something stepping stones showcased in their app and we found it would be useful to our users thus the to-do list was introduced.

Experimental Methods

To date, we experimented with different platforms to develop our application and have tried different colors, fonts,, and layouts to suit the needs of our target market. In addition, we have experimented with different features to code into our app. We intend on asking adults with intellectual disabilities to participate in an online survey discussing their issues in their daily lives especially in relation to technology. We also plan on doing a field test with our app and soon to be developed wristband. Experimentation will also be done regarding features, hardware and design for the wristband

Survey: Questions

Question 1: Do you have access to a mobile phone or tablet/iPad

We asked this question as we wanted to know the amount of users that owned a physical device of their own or that they had regular access to which they could download our application on. This question was left as a yes or no and we expected our results to be between 80 to 100 percent.

Question 2: Does music help you relax?

This question we asked as we had spoken to a parent of someone with autism who recommended and was enthusiastic about music music therapy is an effective way for calming down in a stressful situation. We wanted to know if our target market would be interested in this and wanted to hear if they found it beneficial. Our question was set as a Yes or No and we expected the majority of our answers to be Yes.

Question 3: Would you use a calculator to help you add up the cost of items when you are out shopping?

We planned to put a calculator feature in the early developmental stages of building our app and we wanted to confirm a use for this feature or if said feature would even be useful.

Question 4: Would a to-do list be useful in an app for when you go shopping?

We wanted to know the percentage of our users who would feel inclined to use a todo list feature on their phone rather than writing a list. We left the options on our question to be Yes or No and expected around the majority of our survey participants to say yes.

Question 5: Would you use a planner app? to help remind you of upcoming events.

Again, in this question we wanted to hear from potential users and people who actually have an intellectual disability. We had been speaking to Nualla Allen, a mother of two sons with autism as well as a worker at SAF, Galway, Ireland who helped us decide on what features to put in our app. She suggested a planner app to assist with planning and organisation which we felt was a good idea and wanted to know if our potential users felt the same.

Question 6: Do you feel nervous meeting new people

We wanted to ask this question to know how our survey takers felt about talking to new individuals and being in different environments. We wanted to help our users in all areas of their lives and wanted to know if interacting with new people was one to focus on.

Question 7: Would a Text to Speech Feature help you vocalize your thoughts?

From research we had done online, we were aware that some of our users may be non verbal and so we wanted to know if bringing a text to speech feature would benefit our users or if it would be an effective way to communicate.

Question 8: Would you like a handy list of organisations that could help you?

We wanted to include resources that provided information and assistance but we weren't sure if our users even required this feature. We left the options for this question as a Yes or No and we didn't have many expectations for the results of this question.

Question 9: What features would you like in an app to help assist you in your everyday life?

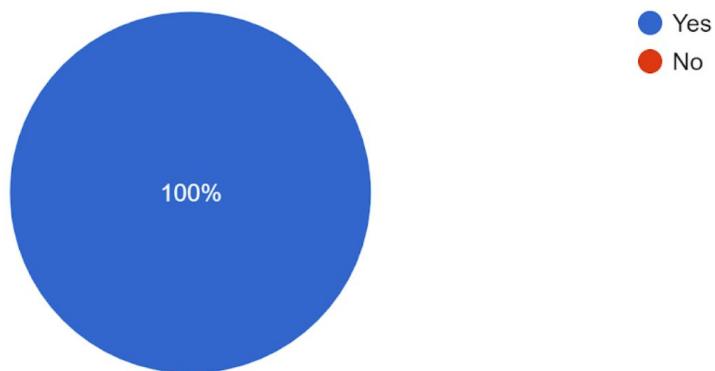
This question was asked as we had a list of features that we compiled from doing research on the needs and wants of people with disabilities and we wanted our survey takers to give us some guidance on the features they would find helpful/ regularly use

Question 10: Click on all the features that you would use in an app.

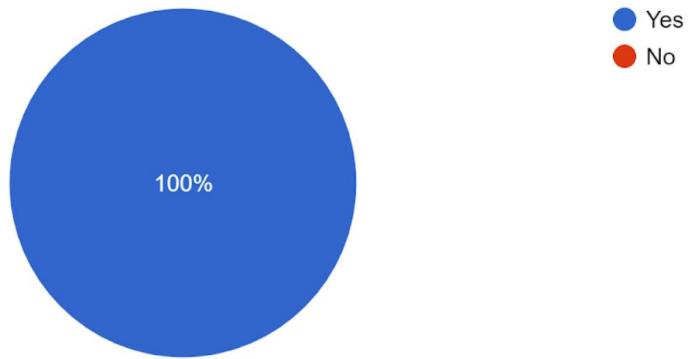
We asked our survey participants to give us input on a list of features we had compiled and we wanted to narrow down the amount of features we had to make sure we did not overcrowd our app. With this question we were able to select the features that were most useful to intellectually disabled people.

Survey Results:

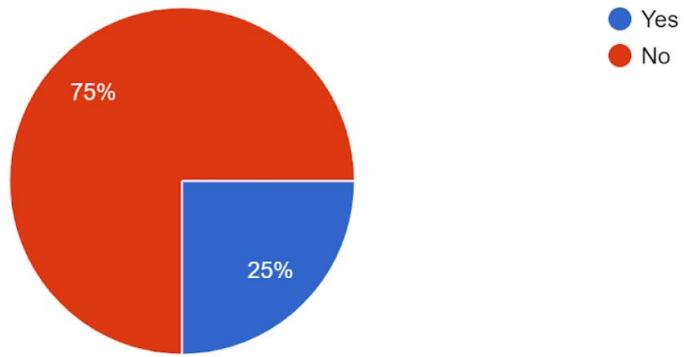
Do you have access to a mobile phone or tablet/iPad?



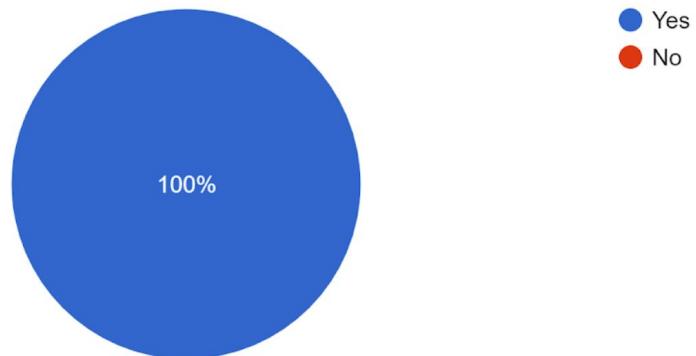
Does music help you relax?



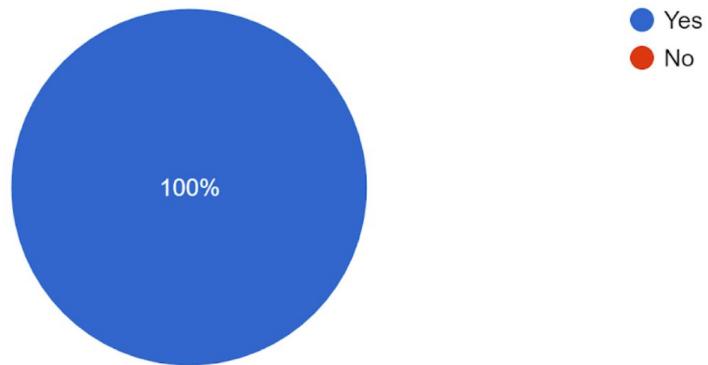
Would you use a calculator to help you add up the cost of items when you are out shopping?



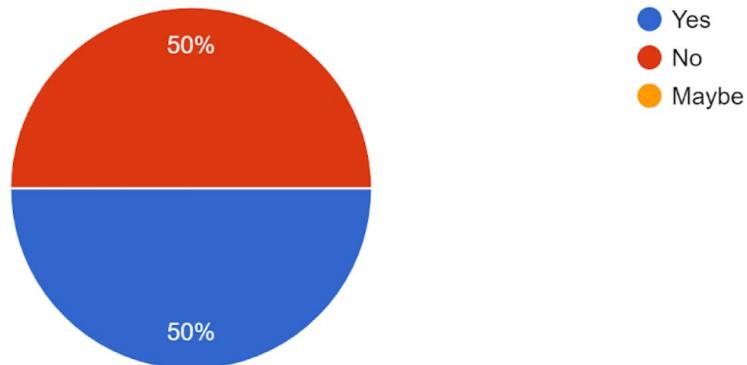
Would a to do list be useful in an app for when you go shopping?



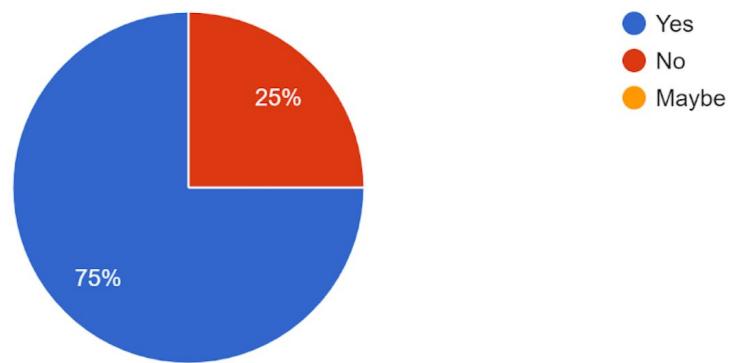
Would you use a planner app? to help remind you of upcoming events.



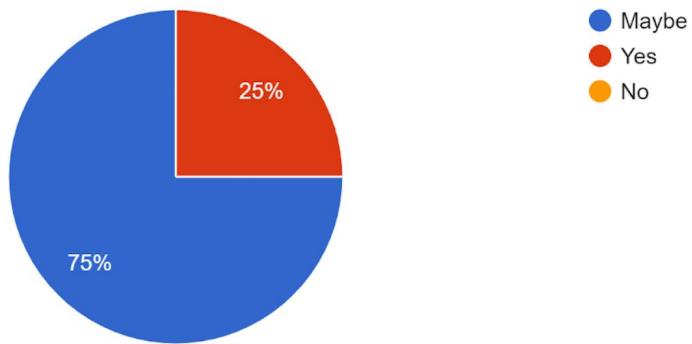
Do you feel nervous meeting new people?



Would a Text to Speech Feature help you vocalize your thoughts?



Would you like a handy list of organisations that could help you?



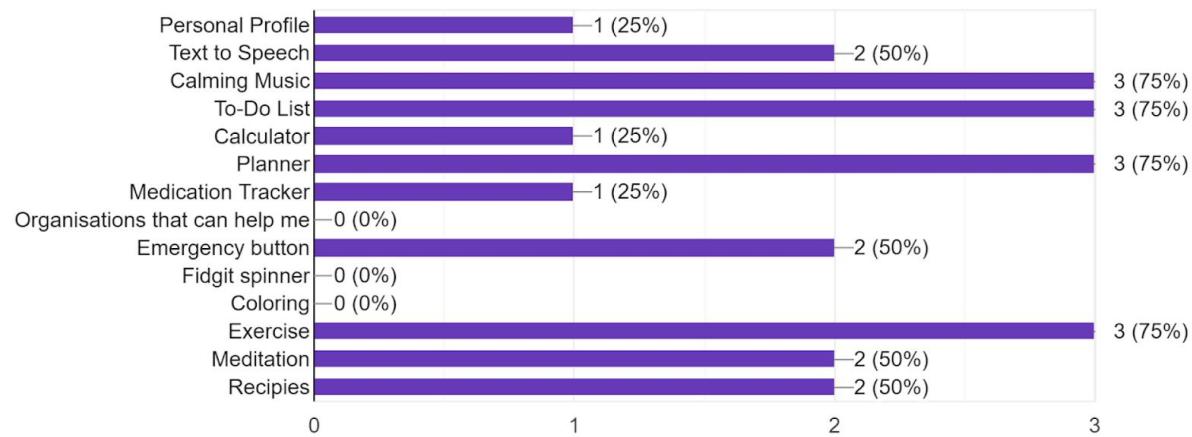
What features would you like in an app to help assist you in your everyday life?

Visual Reminders

I would like to have something that would link my interests to what's on in the community e.g. I like football what football matches are on in Castlerea or on the TV this weekend.

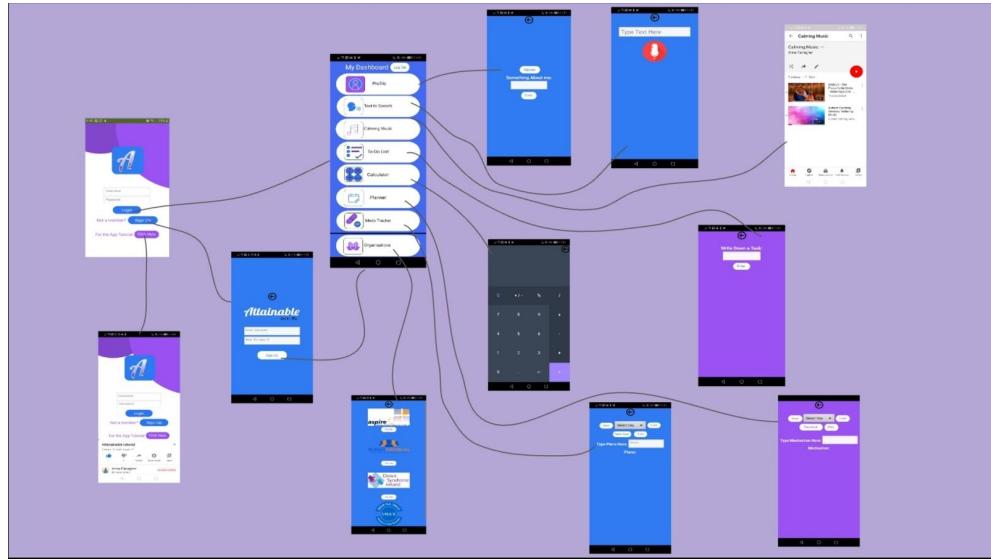
visual reminders, my literacy is not great

Click on all the features that you would use in an app

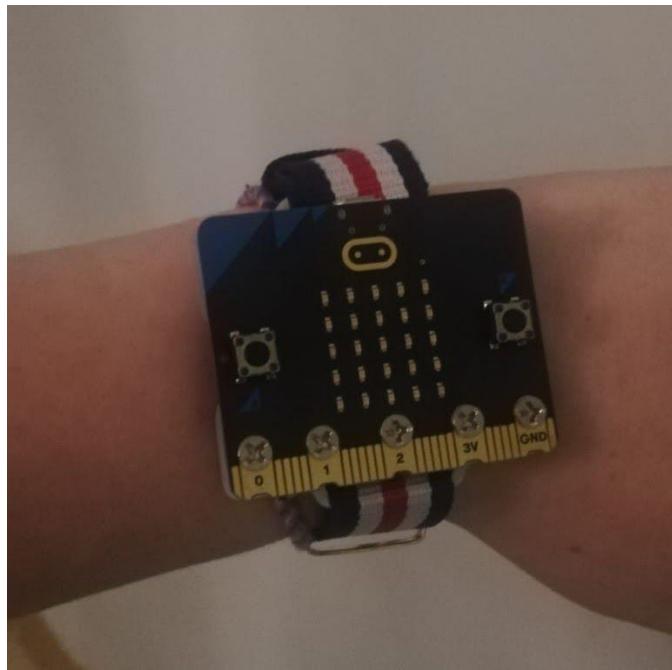


Results

Here is the wire frame for our app. In total we have 12 screens included in our app.



Here is the prototype of our wristband. To date we are still trying to perfect it.



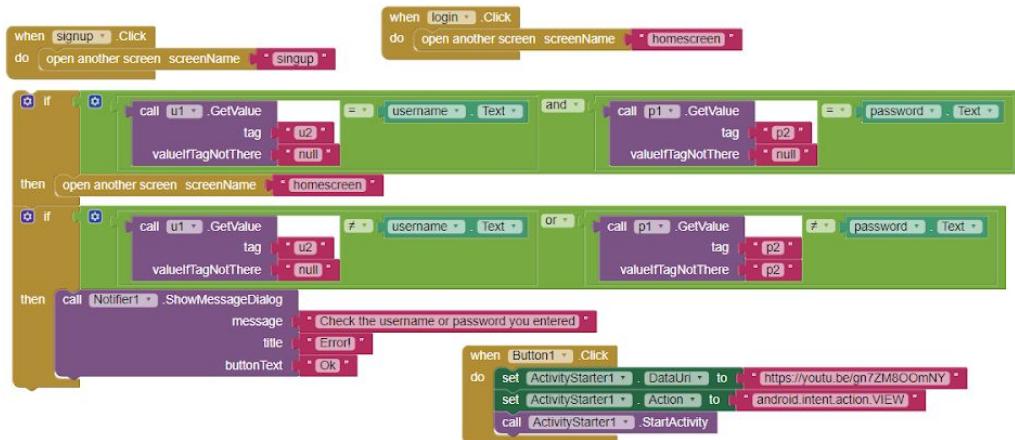
These are our screens for our application

Sign in Screen	Home screen	Links to organizations	Profile	Medication Tracker
Weekly Planner	Text to Speech	Calculator	To-Do List	Calming Music

Below are screenshots of the code used in each feature.

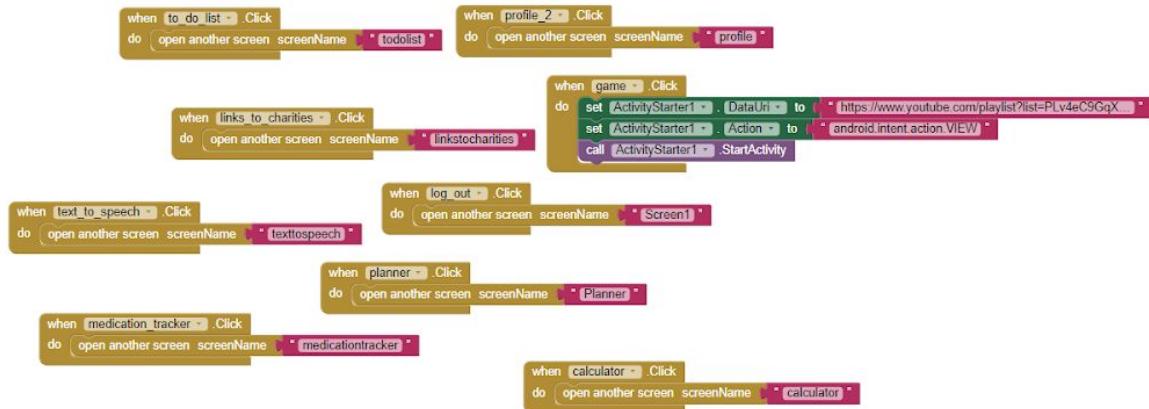
Sign-in screen

The sign in screen allows users to either create a new account or sign into an existing account.



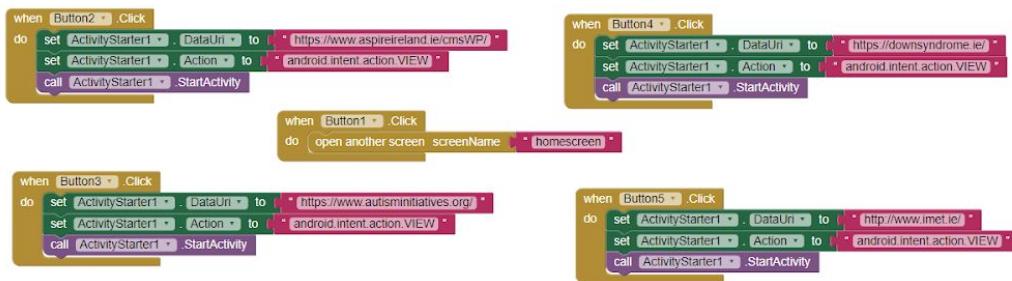
Home screen

This feature is what allows users to have access to each feature in the app. It is laid out in a simplified format, using bold colors and icon that visually show the purpose of each feature.



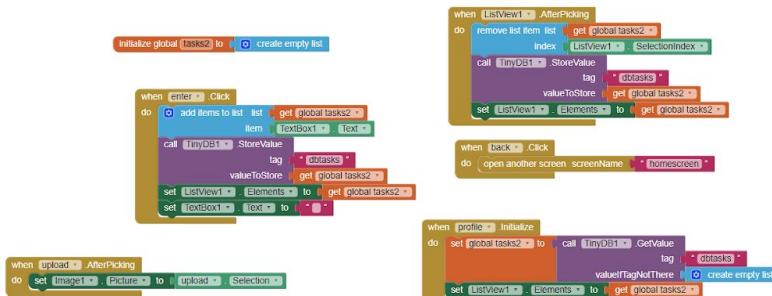
Links to organizations

This feature includes links to helpful organizations that give useful information about different disabilities our users may have. For example Aspire which is a non profit organization that works to promote an understanding of Asperger Syndrome in schools, colleges, workplaces and the wider community to ensure that your needs are met, wherever you choose to go in life.



Profile

The personal profile feature allows users to input information about themselves that may be of use to others for example what may make them comfortable or uncomfortable in certain situations.



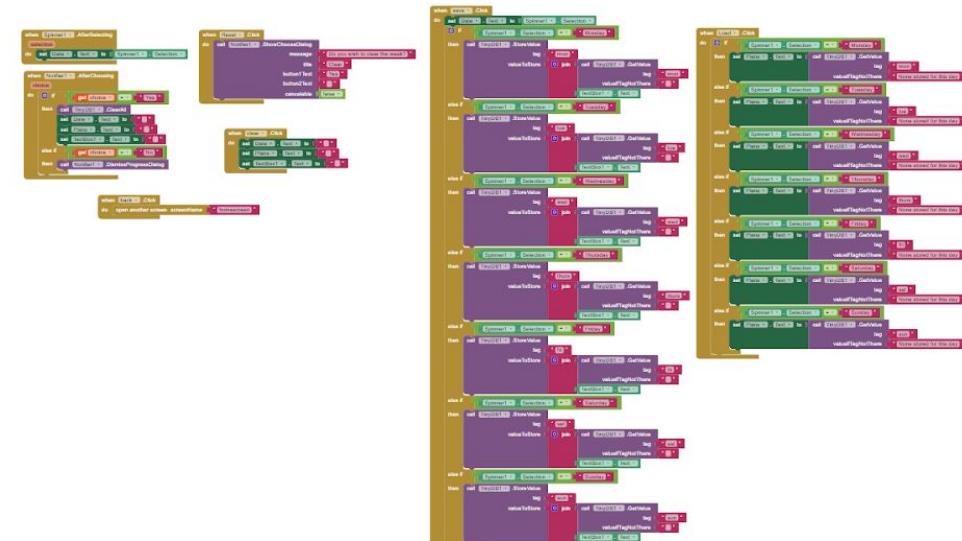
Medication Tracker

This allows users to input any medication they may need to take and reminds them when to take it.



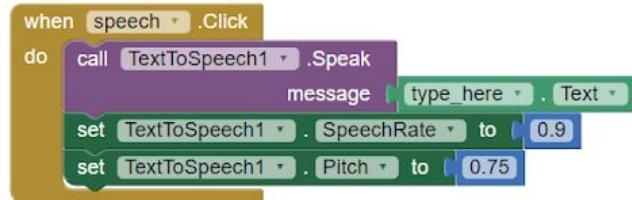
Weekly planner

Allows users to input their weekly plans so they dont forget about them.



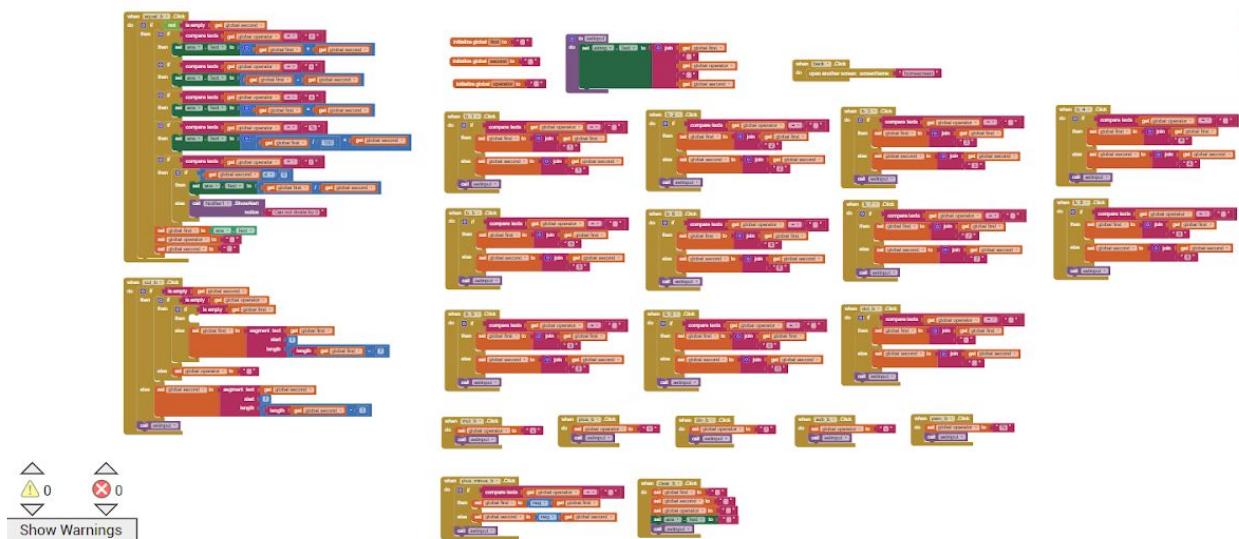
Text to speech feature

This allows the users thoughts to be vocalized. This feature is aimed more for our potential non verbal users.



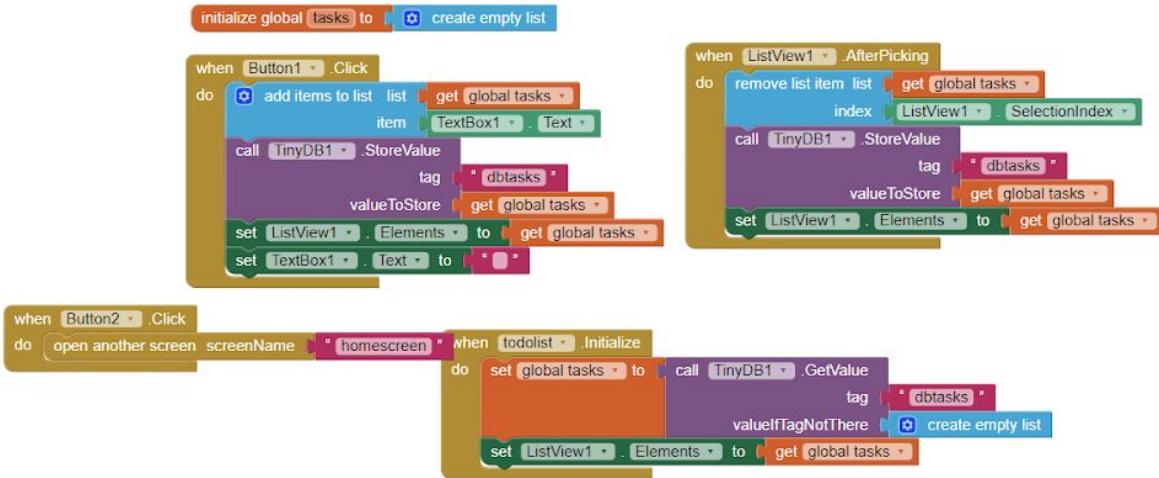
Calculator

We use loops and arrays here. This feature allows users to add, multiply, divide and subtract numbers



To- do list

The to do list allows our users to input their daily , or weekly tasks in one place so they are clearly laid out. Once a task is complete you can simply delete it by tapping on it.



Conclusions and Recommendations

In reference to our hypothesis. “Our aim is to create an application that allows its users to become more independent and help make their everyday lives easier”. We have successfully created an app using mit app inventor that allows our users to input their likes and dislikes, reminders on daily tasks and what medication they need to take and their plans for the week. We have features such as a calculator, relaxing music and links to helpful organizations that give information about different disabilities. We have also developed a feature that allows our non verbal users to type in what they wish to say and it speaks it for them.

We have gained insight on the needs and wants of people with intellectual disabilities from the participants who partook in our survey as well as the healthcare professionals we interviewed throughout our project and will use this knowledge for personal growth as well as future projects that we may work on. Furthermore, we have gained a better understanding of Mit App Inventor which we will use when we develop more applications in the future. We have also managed to contact and form bonds with organisations across Ireland that assist people with intellectual disabilities.

We cannot compare our research to any existing applications as our application does not have many similar functions to pre-existing applications that assist people with intellectual disabilities though we feel we successfully analysed similar apps to ours and added any function that we felt would benefit our users from information we gained that was found through case studies and interviewing professionals.

In the future, we want to improve the visuals of our app and update pre-existing features through developing our application on a more advanced platform such as Android Studio. We also would like to finish our wristband add on which currently is in development and will have features connecting to the app via BlueTooth, contain an audio recording of an introduction of themselves which they can play to new individuals they meet and also have a feature on the wristband itself allowing users to contact their careers for assistance. We also plan to make an audio version of the app for people with visual impairments.

Acknowledgments

We thank and acknowledge the following for their guidance and help in our project:

- Our lead mentor Iseult mangan
- Mel (another mentor)
- Helena Bell - Social care worker
- The brothers of charity Galway
- Nuala Allen
- Stephine Hogan
- Sarah Farragher - OT
- Pamela Daniels
- Our survey participants

Appendices

Below are some of the email exchanges with The brothers of charity Galway.

----- Forwarded message -----

From: **Pamela Daniels** <Pamela.Daniels@bocsi.ie>

Date: Fri, 30 Oct 2020, 2:56 pm

Subject: Attainable Project Assistance

To: theresdevassy18@gmail.com <theresdevassy18@gmail.com>

Hi Anna and Theres,

I hope this email finds you both well. I am emailing you in relation to your project for developing an app for people with an intellectual disability to help increase their independence in completing everyday activities and assisting them with social communication. Your email to Eamon Loughrey was forwarded to me by my manager as I work as a Speech and Language Therapist with adults with Intellectual Disability within the Brothers of Charity Roscommon.

I was wondering if you could give me some more information on what exactly your app will entail and how it will work. Also you mention in your email about people within the service participating in a survey. What information does your survey seek to gather and how do you propose to gather it?

If it easier to chat about the project over the phone I can give you a ring on Monday at a time that suits you to discuss the project in more detail and see if I can be of any help. Please let me know what suits.

Kind regards,
Pamela

Pamela Daniels
Speech and Language Therapist
Brothers of Charity Services Western Region

 CORU Registration Number: SL016962

 **Pamela Daniels**
 to theres, me ▾

Fri, Nov 6, 3:33 PM ⭐ ↶ ⋮

Hi Anna and Theres,

 Sorry that you got caught up with school things. Just in relation to the app:

 1. What will the app look like in terms of design? Can you give me an overview of it in general.
 2. What features will the app have to increase independence with daily activities and what activities will it focus on?
 3. Does it focus on helping people with a particular level of intellectual disability i.e. mild/moderate/severe?
 4. How will the app help improve social communication?
 5. What do you need from us in terms of reaching people with an intellectual disability who would be willing to participate in a survey we are conducting?
 6. What questions are in the survey and how will it be presented to the people participating in it?
 7. Any other information you think is relevant

I will return to work on Monday 23rd November and will link with you then.

Kind regards,

Pamela
Pamela Daniels
Speech and Language Therapist

 **Anna Farragher** <anna.farragher1@gmail.com>
 to Pamela ▾

Sat, Nov 7, 7:53 PM ⭐ ↶ ⋮

Hi Pamela

So to answer your questions about the app, here is the link to a tutorial we had made for our app which explains how to use the app and show what it looks like and what it does.
<https://www.youtube.com/watch?v=gn7ZM8OOnNY&feature=youtu.be>

We need to collect data for young scientists about what features may help someone with an intellectual disability and help make their everyday life easier. We would love for some of the clients you may work with who have disabilities such as autism and Down syndrome to take part in the survey.
 I have attached below the link to the survey so you can look at some of the questions we are looking to ask potential users of the app.

Attainable App Research Survey

We are also developing an add-on wristband for the app that will have an emergency button that will contact the user's carer if they are in danger or in need of help and an audio version of their personal profile which will help non-verbal users when they meet new people. It will state the user's name, list some of their likes and dislikes, and what makes them feel uncomfortable, for example, Hi my name is joe, I love ice cream. I don't like being touched but I am comfortable to shake your hand.

I have attached below a picture of our first prototype we are currently working on. Thank you again for helping us we really appreciate it. Hopefully, this email answers all of your questions, if you have any further questions please email us :).

Anna & Theres

...





Attainable tutorial



Pamela Daniels
to me ▾

Fri, Nov 27, 8:58 AM (9 days ago)



Hi Anna and Theres,

Thank you for your email outlining the app and your links to both the video and survey. Apologies I am only getting a chance to get back to you now. I was on leave for the last two weeks. I will forward information on your app, the video and survey to some managers within the organisation and hopefully they will nominate some houses where people supported could complete the survey for you. I would also advise contacting Western Care as they cover the Mayo area in terms of disability services and community houses for people with intellectual disability. I hope this is helpful.

[That's great, thank you so much!](#)

[That's great, thank you very much.](#)

[Thank you so much!](#)

Reply

Forward

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