



A Paradise Of Your Favorite Voices

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ABSTRACT

The world we are surrounded by is full of extraordinary and important visual aspects. Sometimes we don't have the time to enjoy these and sometimes we are not able to experience them. The visually impaired are a significant block of Social media users. But the question is: how many visually impaired people are on Social media? We can only estimate this number. According to '**IOVS Journal**' Globally, among 7.79 billion people living in 2020, an estimated 49.1 million are blind and more than 200 million are MSVI. At least 2.2 billion people have vision impairment or blindness.[paho] If 100 people visit a site, statistics would have it that approximately 10 of them have inability to perceive any color whatsoever. Although the statistical proportion of users having visual impairment is small compared to others, we still must understand their need to connect with friends and family through social media. We must demonstrate the need for more work facilitating to incorporate designs that offer assistance and ease of use. We have so many emerging technologies to make sure most of us can enjoy our surroundings, yet there's great deal of confusion surrounding the social networking sites. Although there have been many improvements made over the past decades and with the help of screen readers, computer vision, GPS, and Braille keyboards many visually impaired persons can lead a better life and communicate easily, they are not able to get complete benefits of social media that most of us use nowadays. Social media are mainly focused on visual content and their form of communication is also visual based. This creates a huge gap between the visually impaired person and the rest of the world. Therefore, we plan to create a platform where users

will be able to communicate only using their voice. while most social media require your visual attention, we are trying to make it possible without it. Our app “VoiceParadise” will comprehend the need of visually impaired users and help them to form bonds around the world in an easy-to-use environment. Since it can be done using only vocal commands. Many multi-taskers and in general, everyone would be able to communicate comfortably.

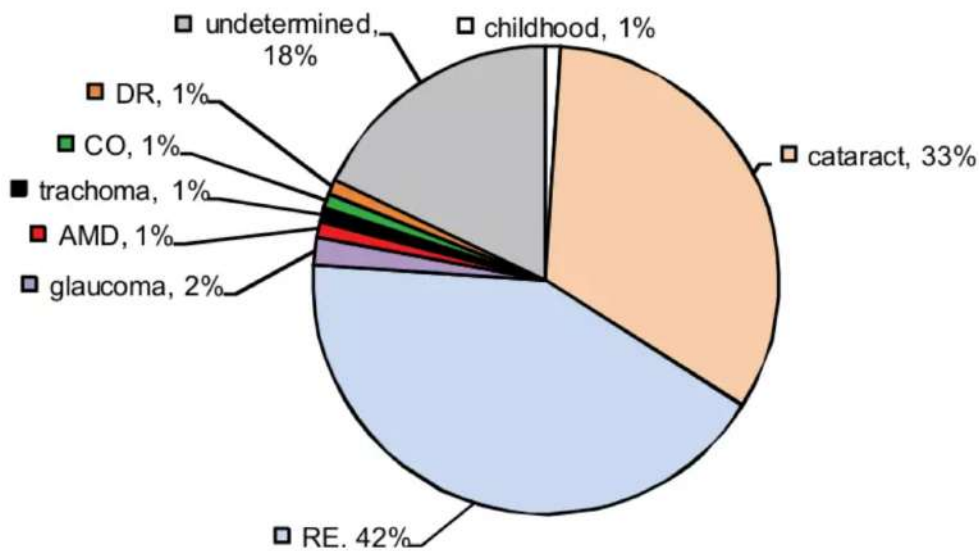


Figure: Causes of Visual Impairments Globally[11]

BACKGROUND

Having low vision or no vision comes with many challenges. They are just like the rest of us. Only difference is they are visually impaired. That doesn't mean they have to stay isolated. The world we live in is designed to serve the majority or the average people. In doing so we keep many of us out of our reach. That means , if you are not an average human being, you are not connected to the world. This makes it even harder for the visually impaired person because they

are getting less information. It makes their day to day life challenging. Not being able to connect with the sighted individuals push them to more darkness. It increases depression , anxiety and in most cases they can't share it. Even for a sighted person, it is easier to express your feelings by saying it instead of writing it or displaying it in any other form. It is also easier to understand someone's tone and story by listening to it. And in today's world, the era of internet, where most of us surf the internet and share our thoughts, we don't have any convenient social media that focus on doing that or make it any easier for visually impaired person. According to the '**world blind union**' 90% of the published materials are out of the reach of the blind or partially sighted person. We want to close that gap.

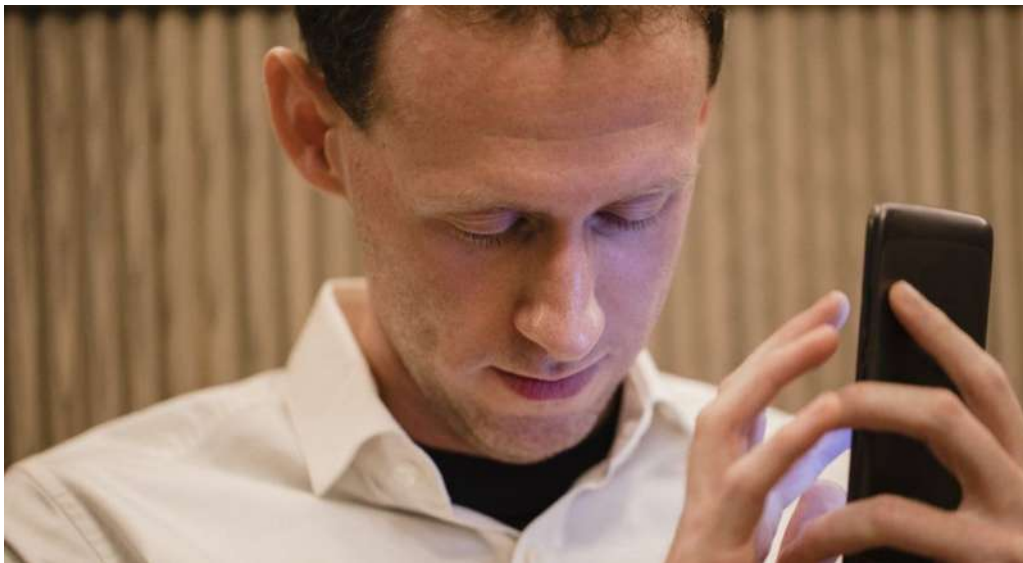


Figure: Social media is closed off for visually impaired People [10]

STATEMENT OF THE PROBLEM

Even though there are a few assistive technologies arriving and trying to solve these problems but many of them really seem to struggle with connecting users. With popular virtual assistant like Alexa, Siri , google assistant, you do simple tasks but sharing your feelings and connecting

to the people in your day to day life are still out of reach. We find it obnoxious to use sometimes. Even the popular social media sites/apps mainly focus on sighted users, their post sharing options are visual, pictures and videos. A visually impaired person can use a screen reader to read part of the sites, maybe interact using some other tool, but that doesn't give them the full benefits of using a social media. Some of the tools used to interact with these sites are expensive as well. Because of all these, they become distant from their own close ones as well. Most of these sites/app add many features on each page to keep the users interacting to the site, but what they forget is, sometimes we look for quick ways to connect. Being able to stay connected with our friends and family simply makes our life comfortable and allows us to focus on other things. We want to make our app as simple and easy to use as possible for the multi-taskers and most importantly a platform for everyone. Where a sighted individual and visually impaired individual can communicate. We want to achieve this by make the app usable just using our voice. We want to be able to share our message using our voice. we want to be heard and listen to the ones that matter to us. We want to connect users with visual impairments who should not have to adapt their behavior to effectively accomplish their goals. Rather, they should be given a good accessible platform with the same experience as sighted individuals.

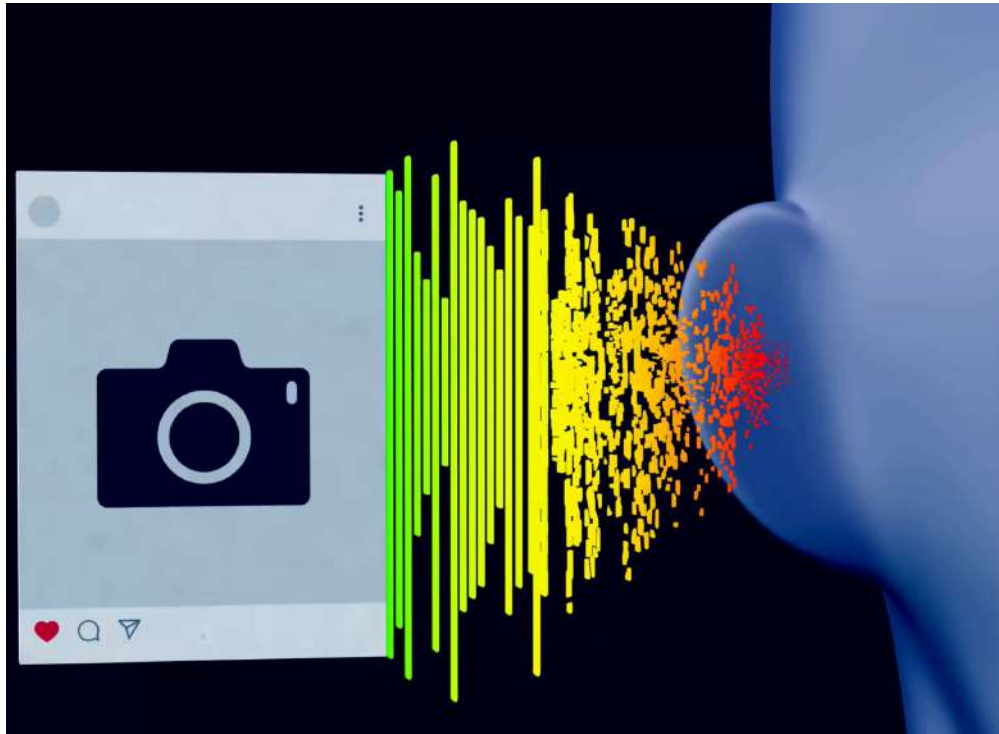


Figure: What it is like browsing in existing Social media while visually impaired.[9]

RATIONALE

Our proposition

VoiceParadise is a platform fully geared by your voice, that feels natural when it comes to communication. We have audio messaging available which will allow users to hop in and join a conversation that interests them without having to scroll or stare at a screen. A feed where you can share your voice and you do not have to write it. You will be able to know what is going on in the lives of your friends and family and share your own thoughts with them. We will be able to create a paradise for the voices that matters

Why are we different

We found out that accessing and using social media is a different experience with a visual impairment or blindness, and that the apps you find most useful now might be different as you start losing your sight. In this era of the internet, voice has become more important than ever as a way to stand out from the crowd of digital chatter.

To those who yearn for user-friendly simplicity, VoiceParadise will allow users to connect with friends and families via voice chat and audio feed. We acknowledge that the voice is one of the most information-packed ways of communication. Therefore, we want to use it to connect more of us.

DESIGN AND DEVELOPMENT

The VoiceParadise is developed for both Android and iOS users. The major features of VoiceParadise includes custom diagonal Swipe, Voice navigation, larger simplified buttons ,Audio Instructions, simple chat and post UI.

Our Technology Solutions

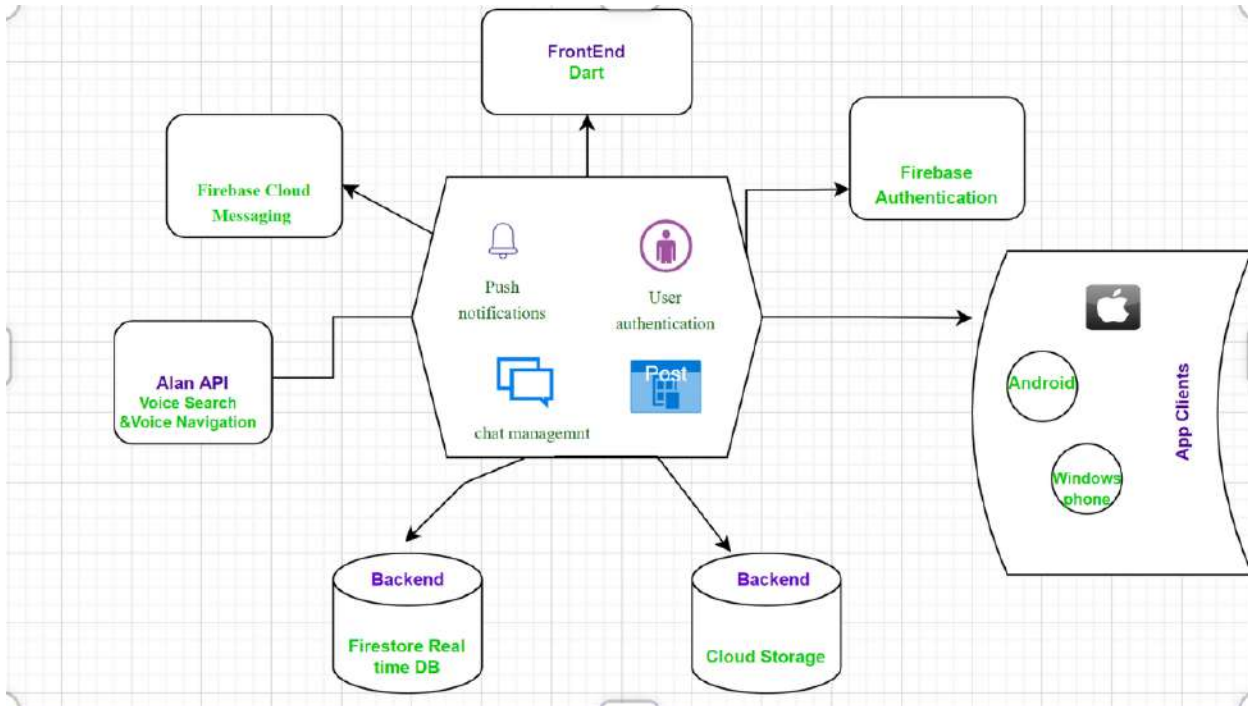


Figure : Our Technology Stack

Flutter



We chose to use Flutter because it provides a native performance experience on both iOS and Android.

Flutter is Google's open source technology for creating mobile, desktop, and web apps with a single codebase. Flutter is known for building impressive, natively compiled apps for web, mobile, and desktop using a single codebase[8]. Dart is the programming language which is considered one of the largest technical and mental stumbling blocks of Flutter development. The Dart programming language is easier to read, write, and debug than other languages. Flutter is considered as a widget-based technology. This means that you can apply object-oriented programming to any element. One of the benefits of using Flutter is that you can modify or customize widgets with ease. In addition, it provides UI widgets that meet key web application design requirements.[3] . Hence Flutter clearly stands out to us as our productivity got a boost due to its highly adaptable widgets which helped us immensely in the creation process.

Firestore



With Flutter's flexibility in moving back and forth between iOS and Android in seconds, we chose Firebase as our backend-as-a-service (BaaS) solution that provides us with authentication, data storage, messaging, and more. Officially released in 2012, to this day, it continues to scale and provide more options for developers to easily create, maintain, and grow cross-platform apps[4]. Using Flutter and Firebase gave us an edge when it comes to creating strong defences against vulnerabilities in our app. Firebase real-time database is one of those perfect matches for flutter. In addition to the maintenance costs which are lower, making this combination quite reasonable.



Alan API

Alan API is one of the hot new fields of machine learning and artificial intelligence which is a complete Conversational Voice AI Platform to Build, Debug, Integrate, and iterate on a voice assistant for our application. The Alan Platform provides all the tools and leverages the industry's best Automatic Speech Recognition (ASR), Natural Language Understanding (NLU) and Speech Synthesis technologies to automate an in-app voice assistant from scratch.[2]

USER INTERFACE DESIGN

Our user interface consists of 2 main components - the actual UI and the voice command. The actual UI consists of 3 pages - AudioFeedPage, ChatPage and HomePage.

Audio Feed Page



Figure: VoiceParadise Audio Feed Page

The audio page is where you will be able to post audio you want your friends on the app to listen to. We have included 3 large buttons on the page that allow you to record, play your recording, upload record or restart the recording. Along with that we have large audio buttons in the middle of the page that allow you to play the audios that have already been uploaded to the feed - can be your audio or your friends' audios. You also have the option to record and upload audios via the voice command button at the bottom left.

Chat Page

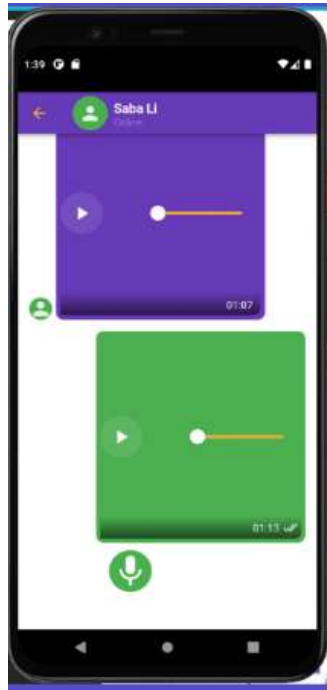


Figure: VoiceParadise Chat Page

The chat page is where you can chat with your friends in private conversations. You start off on a friends page - which lists all your current friends - and once you click on a friend you enter your chat. The friends buttons are very large as well. Once in the chat you can see all the audio messages you guys have sent each other - your in green, theirs in purple. Again they are very large audio buttons so you can easily click them and hear the uploaded audios. Finally there is a large mic button in the bottom middle of the page which allows you to record, and upload the recording. Once the recording process starts 2 extra buttons will appear on the side of the recording button - the redo and delete button. Voice command is also a viable option on this page which would allow you to send a voice message hands free.

Home Page



Figure: VoiceParadise Home Page

Our home page is a very simple design. We have only included your bio pic in the middle of the page to indicate that the user is the center of the app. Along with that, this page employs the 4 function swipe for app traversability. The middle to top right swipe will take you to the audio page and the middle to top left swipe will take you to the chat page. We wanted our landing page to be as simple as possible.

Video Link: https://www.youtube.com/watch?v=ZMqPJKqG4yo&ab_channel=moshahidkallol

USER FEEDBACK

The initial design was mainly inspired from meeting one of visually challenged friend who talked about her challenges using Social media. After we had our initial design

implemented, we presented it to her and got invaluable feedback and guidance that helped evolved our vision further. The evaluation from her was critical in our initial design phase.

We have changed our app alot based on the feedback we have received. Most importantly we changed our name from VoiceAdise to VoiceParadise - 95% of our surveyors agreed with the change.

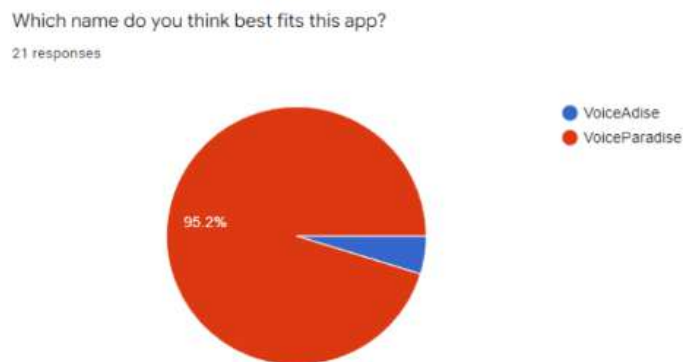


Figure: Survey Results of our App name

Our users also enjoyed our voice command feature - 81% of users were satisfied with the feature and 71.4% found it useful for app usability.

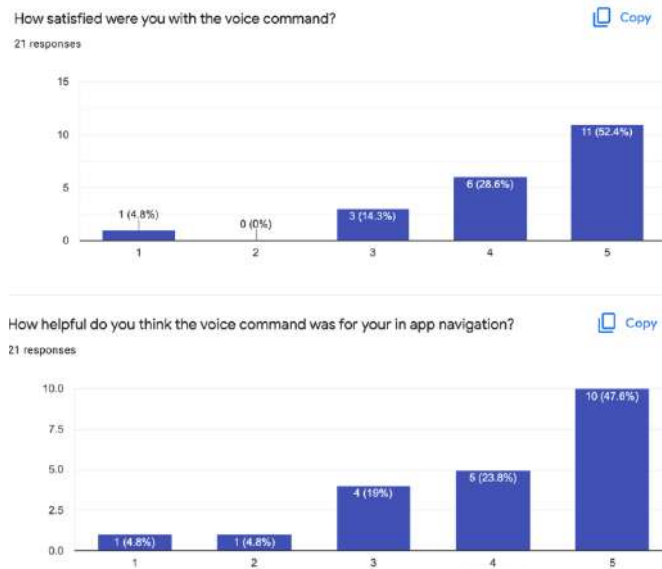


Figure: Survey Results of our Voice command

Our diagonal swipe has really only been complimented, everyone we surveyed has only given positive reviews.

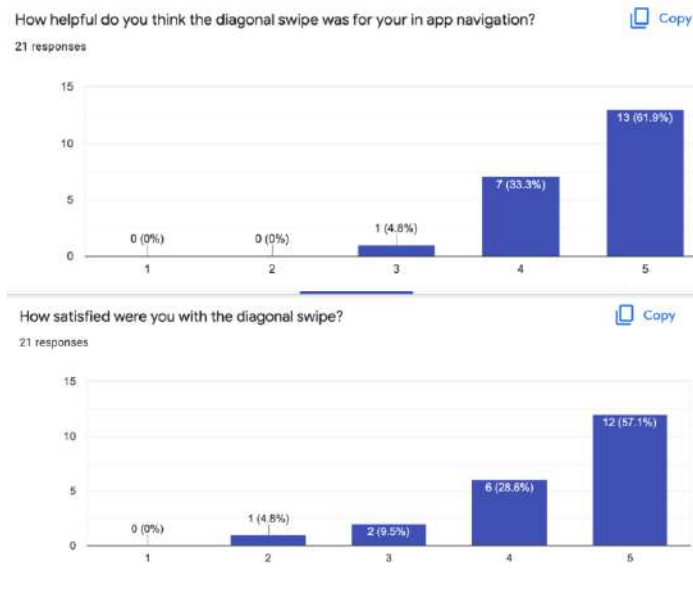


Figure: Survey about the Diagonal Swipes and in-app navigation

We did however change our chat page UI from feedback.



Figure: Chat UI

People found the first UI for the chat page a little confusing. They were used to sliding up and down to see messages which is something they kept trying to do on our first design. We then changed it to something more familiar and less troublesome. We also made changes to our audio page.

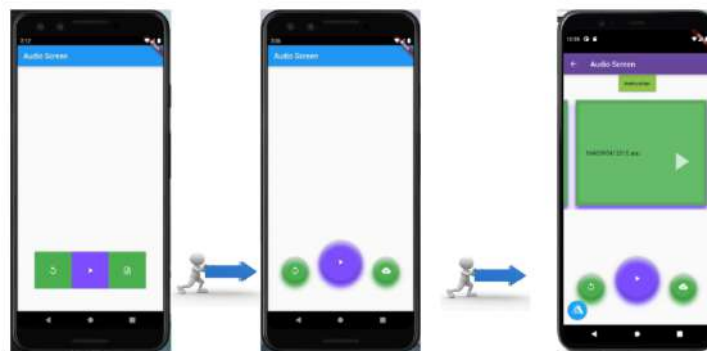


Figure:Audio Feed Page UI from old version to newest

Initially our buttons were square and close together which users found to be aesthetically unappealing. We corrected by making them more circular, large and by spacing them out more.

We also added our voice command in our final design. One other feedback we received was to app talk back button which one of our visually challenged friends found very helpful. Therefore, we added text to speech features in our buttons which will add guidance for our target audience.

BRANDING

Name

Our logo Name begins with the words voice and paradise. We want the user to see this app as a paradise of their favorite voices. The name “VoiceParadise” emphasizes our voice affects others, and their voice affects us. Paradise is more about hearing the voice of our loved ones which always give us happiness and delight. Users should only have voices/audios they want to hear on the app such as family, friends, people they idolize etc. In the age of video calls, it has been nice to see the faces but audio-only communication elicits greater empathy. Research has shown that people who are born blind or become blind early in life often have a more nuanced sense of hearing[9]. Thus, more justification to create an audio only platform for the visually impaired community.

Logo



Figure: Our refined Logo

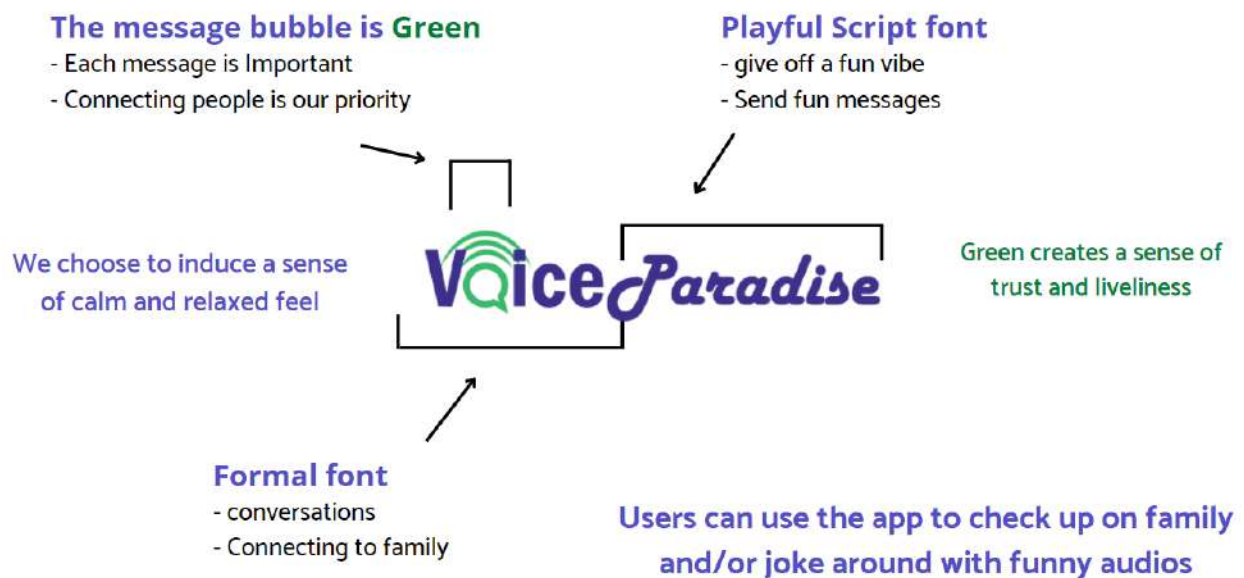


Figure: VoiceParadise Logo branding

We want users to feel calm and relaxed while listening to these audios which is why the font color is purple. We decided to swap out the 'O' with a green message bubble to indicate the

importance we place on the messaging system - emphasizing the connection between users. Finally, we wrote VoiceParadise in 2 different fonts. The voice in VoiceParadise is written in a formal font which is to convey a serious tone, telling users that the app can be used for connecting to family, having conversations etc. While the paradise is written in a playful script font which is intended to give off fun vibes and encourage users to send fun audio messages.

Colors.deepPurple[900]
Colors.deepPurple.shade900

0xFF311B92

Colors.green[700]

0xFF388E3C

For the design of our logo, we used the above colors because as we previously mentioned in the logo section, these colors represent calmness and fun vibes at the same and we wanted to carry out that same feeling throughout the entirety of the app.

DISCUSSION OF POTENTIAL MARKETS & FUTURE WORK

Potential Market

Globally there are 43 million people living with complete vision loss and 295 million people living with moderate-to-severe visual impairment. Our market would consist of these

individuals along with their family and friends which would broaden our market even more. Our customers would include the visually impaired and their friends and families.

Yearly Cost (Estimated)

We will launch the app in both the google play store and the app store. It may be tempting for to create an app that can satisfy a wide range of audience but we initiated with our target audience which is visually impaired since we want to put more effort into addressing their precise needs. We would start our app for free. Since we believe we will gain more downloads simply out of curious audience. But we will have a subscription for special features and going ads free which is about \$1.99 for both google and app store. We decided there will be a yearly charge of \$9.99 for the premium ads free version. There will be a maintenance and serving cost for Alan API and firebase which is estimated to be \$900 per year. We will appreciate any state and Federal Grants and donation. For the base version, we will use audio podcasts and music as sponsorships.

Future Work

Our future work involves creating a more accessible sign up process. We hope to create one that can be done hands free and without the visually impaired needing the help of another person. Along with that we want to employ our voice command everywhere around the app along with the audio instructions. Our main goal however is to act as a middle man between the visually impaired and the current social media. We want to extract what's trending on apps such as

instagram, tiktok, facebook, twitter etc. and have it accessible on our app. Other side goals would be audio library, search function and audio group chats.

CONTRIBUTION

Farah Sultana

I was our backend specialist. Color scheme of the app was my idea since I find green as restful and quiet color symbolizing nature and to bring balance I added deep purple which gives fun vibes. At first I initialized the GitHub repository with a flutter project to collaborate works with the team members. I have to integrate firebase and add it on to android app before I design anything in the backend. Then I added the backend logic for the 'Login' and 'Sign up' screen in mid February. Later in the month, the animation of the welcome screen has been added. The logout function and forgot password functionalities has also been implemented and tested in the beginning of March. The main focus was to set up the backend for the chat page and the audio feed page and Friends Page which was done by Mid April. After the UI of those pages were set up I would start connecting it to the database by programming each button. I managed all backend bugs and ensured that records would get uploaded quickly and correctly. Finally, I moved on to implement navigation between screens and in app voice commands. Voice navigation has been implemented in the ending of April. I was working on the users commands with kallol to make sure it works on different actions in the screen. I also worked on the voice navigation which has has few bugs. It did not relay the pre-defined information back to users based on matched inputs. I was able to fix much of it as we proceed to our final iteration. Along

with the backend, I was making sure to update weekly wiki Log and accommodating changes hearing from user Feedback. In addition to that I helped with UI fixes for our final chat page design.

Kczynzky Deleon

I was our UI specialist. I mainly set up our apps user interface. Before starting with the prototype, I made wireframe designs on Figma. First I designed the user interface for the 'Login' and 'Sign up' screen. I suggested using diagonal swipes as an alternative navigation. I started by designing the home page and implementing the 4 function swipe. I then created a version 1 chat page and version 1 of the friends page which was then altered based on user feedback. I was also in charge of integration Firebase database to ios. Throughout the project I was mainly focused on the aesthetics of the app, creating designs and implementing the UI we all agreed on. In addition, I made interview questions and I reached out to users specifically my friends and family who have visual impairments for feedback and later interviewed few others with Cataracts about the app functionality and design. I rigorously tested our app to identify bugs and contributed with Farah to fix the bugs.

M Moshahid UI Kallol

I was our team's project manager. I was focused on ensuring our team's ideas were logical and sensible. I always made sure features made sense and design choices were good. I organized the meetings and assigned each team member a task to complete before our next meeting. I created several potential logos and finalise it. I implemented the voice command feature and finalized

the audio page based on feedback. I also worked on the frontend of the friends page. I added text to speech on to the app and make sure the buttons are implemented throughout the app. I was also making sure to come up with survey forms before each presentation, organization of presentation slides, designing logos and coming up with the slogan. I also compiled and edited the videos before every presentation.

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VoiceParadise

