Mint: A voice-enabled multilingual mental health detection and management application

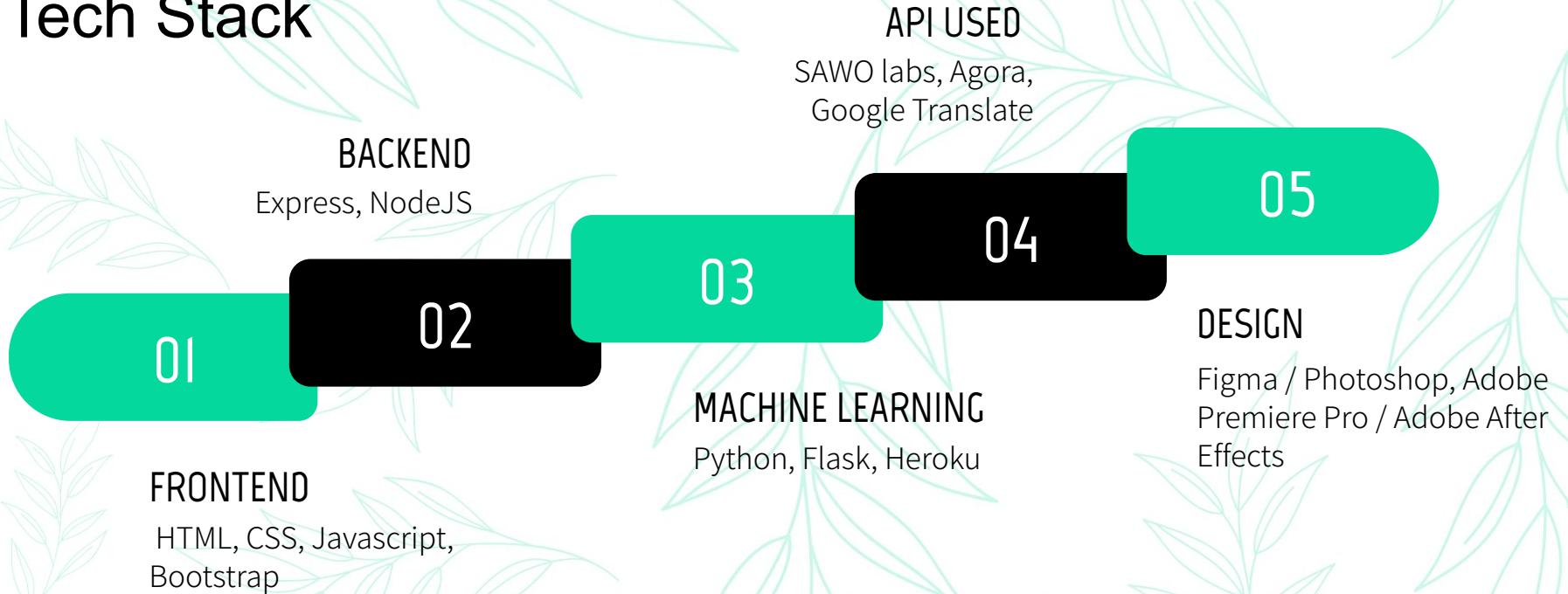# Team: Celestial Biscuit

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Solution

- Mint is a **voice-enabled** and **multilingual** application available in **Indian regional languages** for adolescents, adults, and PWDs to detect mental health issues and aid people in managing them.
- Mint can **detect schizophrenia, suicidal intentions, anxiety, and depression**.
- "TicTac" is Mint's video conferencing and chat platform where users **can connect with support groups and doctors**.
- Mint has a very simple **passwordless authentication system** that can be used by all kinds of users.
- An interesting aspect of Mint is that it offers **art therapy** to the users which helps in the upliftment of their mental health.
- The top mental health applications currently are based out of countries not from India.
- It can also be used as an **extension to the KIRAN facility** provided by the Indian govt.,
- Mint will prove to be an **asset for regional speakers, adolescents, and PWDs**.
- Mint has a **subscription-based model** wherein the premium users will have full access to all features and the free users will have limited access to all features and access to a free 14-day premium trial. In addition to this, users can also opt for pay-per-use model.

Tech Stack

API USED
SAWO labs, Agora,
Google Translate

BACKEND
Express, NodeJS

01

02

03

04

05

FRONTEND
 HTML, CSS, Javascript,
Bootstrap

MACHINE LEARNING
Python, Flask, Heroku

DESIGN
Figma / Photoshop, Adobe
Premiere Pro / Adobe After
Effects

The web application is built with HTML, CSS and JavaScript. We have used SAWO API, Agora, Google Translate self-built APIs, machine learning models and web scraping to power our web application.

Project Flow

Twitter Account

Taking input of WhatsApp Chats from the Web App

Text Extraction

Classification ML Algorithm

Result Generated if the person show symptoms of schizophrenia, anxiety, depression or suicidal intentions.

Intuition: WhatsApp is the most popular application for messaging. A concerned person can also export a person's WhatsApp chats to feed it as an input to our application. In addition to this, people tend to vent out their emotions on social media.

Classification Model Used: SVM
Dataset Used: Self-made dataset from Reddit

Basis of Classification:

1. Suicidal Intentions: fleeting thoughts, suicidal pans, dangerous intentions or behaviors.
2. Schizophrenia: elevated use of words relevant to health issues, anxiety, negative emotions and first person singular pronouns
3. Anxiety and Depression: use of negative words and usage of words around anxiety and depression particularly

TicTac: The Mint Conferencing Platform
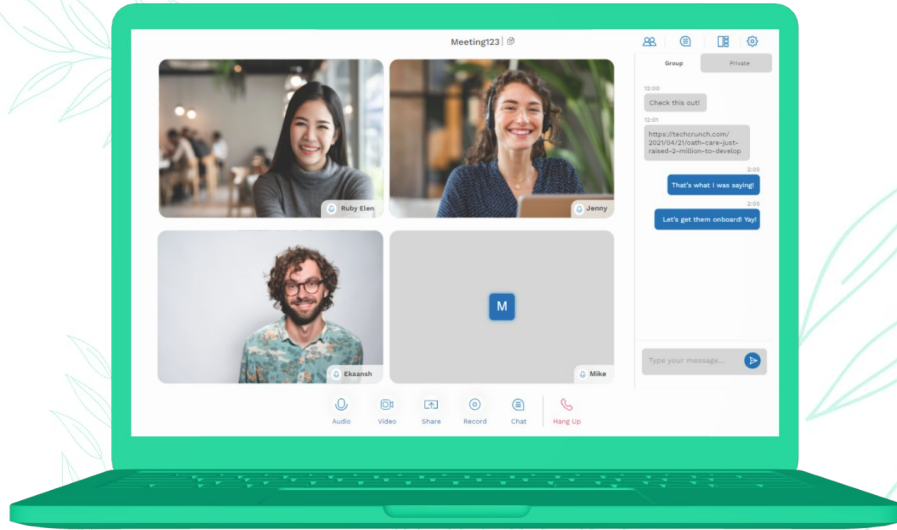
Intuition: Video calling facilities are on the rise since the pandemic hit the world. Online is the new normal, and people find it comfortable to connect with each other from their homes. **Agora.IO** facilitates instant, secure and highly scalable video and audio calling facilities and chat functionality as well.

Use Cases:

1. Patients can connect with their doctors online.
2. Schizophrenic patients do not have access to group therapy in particular, with online chat-rooms, they will be able to get the support they need.
3. Patients having other mental diseases can also connect in their specific rooms to help each other through talking about it.

Mint Is Available in Multiple Languages
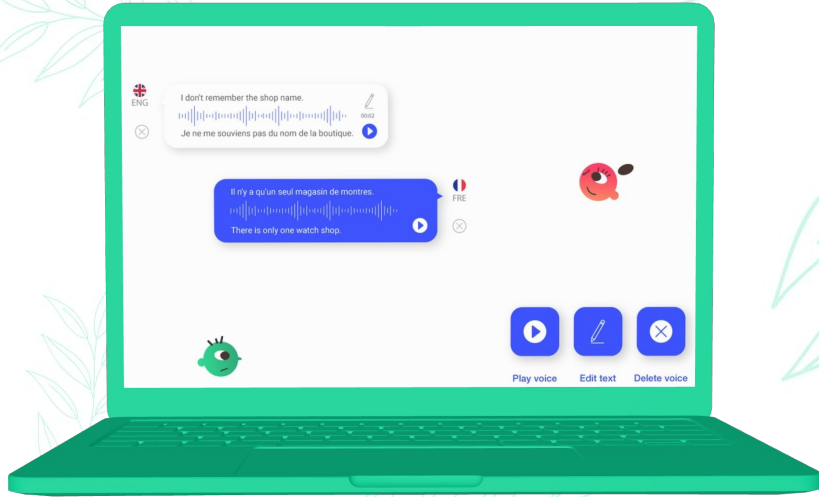
Intuition: To facilitate users from all over India, Mint uses **Google Translate** to make all the information on the application be available in their local language thereby making language a bridge instead of a barrier.

Use Cases:

1. A multi-language UI is enabled.
2. Indian users speaking different regional languages will be able to use the application without any discomfort.

Mint Lets You Login Without A Password
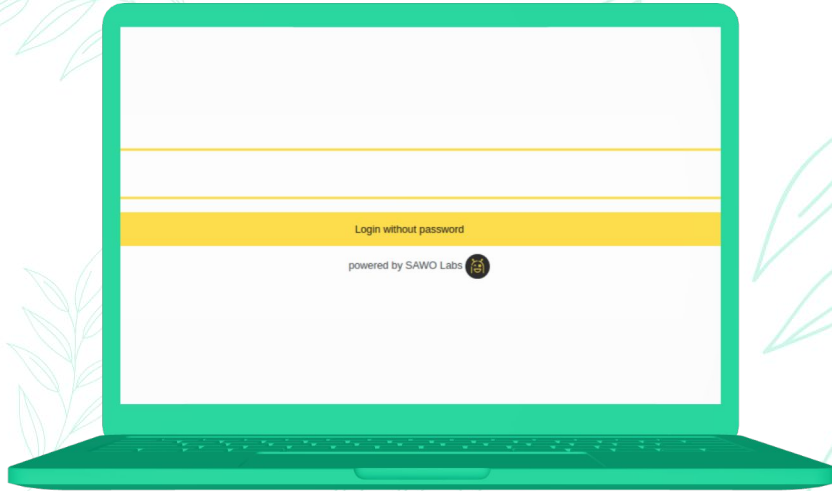
Intuition: People having mental issues might find it inconvenient to remember several different passwords. Passwordless authentication system by SAWO offers a more secure login for the users with an improved UX. This authentication system is now being considered to be better than passwords with biometrics, SSO and social login.

Steps:

1. User enters their email address / phone number.
2. User gets an OTP on their provided email address / phone number.
3. They're in!

Login without password

powered by SAWO Labs

The Minty Art Therapy

Intuition: Art therapy can be beneficial for the adolescents using our application as well as the adults. Art offers a sense of relaxation and accomplishment while engaging the users in a mindful activity.

Activities:

1. Coloring objects.
2. Scribbling on the doodle pad.
3. Doing art with different people on the app.

Solution Challenge/Schiz × | Schizophrenia_Detection × | SIH/Bipolar Disorder/bip × | Bipolar_Detection - Jupytr × | Depression_Anxiety_Dete × | +

localhost:8888/notebooks/Solution%20Challenge/Schizophrenia%20Detection/SchiDetect/SchiDetect/spiders/Model/Schizophrenia_Detection.ipynb

Quickstart: Create a...   AZ 900 Content   Exam AZ-900: Micr   Reading list

jupyter Schizophrenia_Detection unsaved changes)   Logout

File   Edit   View   Insert   Cell   Kernel   Help   Not Trusted   Python 3 (ipykernel) O

Code

```python
In [15]: def predict_tendency(x):
             x = get_clean(x)
             vec = tfidf.transform([x])
             if model.predict(vec)[0] == 1:
                 print("The model predicts the statement to be: Schizophrenic")
             else:
                 print("The model predicts the statement to be: Not Schizophrenic")
```

```python
In [16]: print(t)
         print("--------------------------------------------------")
         print(u)
```

         I would hear something that sound like a plane engine or like a really... you know... a really far off motor. It never went away en
         tirely. It's gone a lot more in the past couple of months since Christmas. It just sounds like that... it sounds like a little fl
         ame or a cellular... a digital motor

         Adults tell me(m15) some funny life stories of yours, give me life advice, all that stuff. I'm also trying to stop procrastinat
         ing so any advice on how to fix that would be great as well.

```python
In [17]: predict_tendency(t)
         predict_tendency(u)
```

         The model predicts the statement to be: Schizophrenic
         The model predicts the statement to be: Not Schizophrenic

```python
In [19]: accuracy = model.score(x_test,y_test)
         print("The accuracy of the model is: ",accuracy*100,"%.")
```

         The accuracy of the model is: 92.71929824561404 %.

Solution Challenge/Schizc ✕ | Schizophrenia_Detection ✕ | SIH/Bipolar Disorder/bipo ✕ | Bipolar_Detection - Jupytc ✕ | Depression_Anxiety_Detec ✕ | +

← → C ① localhost:8888/notebooks/SIH/Depression%20Detection/Modelling/Depression_Anxiety_Detection.ipynb

Quickstart: Create a... | AZ 900 Content | | Reading list

jupyter **Depression_Anxiety_Detection** Last Checkpoint: 6 minutes ago (autosaved)

File   Edit   Trusted   Python 3 (ipykernel) ○

```python
In [29]: def predict_tendency(x):
             x = get_clean(x)
             vec = tfidf.transform([x])
             if model.predict(vec)[0] == 1:
                 print("The model predicts the statement to be: Anxious")
             elif model.predict(vec)[0] == 2:
                 print("The model predicts the statement to be: Depressed")
             else:
                 print("The model predicts the statement to be: Normal")
```

```python
In [31]: print(t)
         print("-----------------------------------------------")
         print(u)
         print("-----------------------------------------------")
         print(v)
```

My whole life has just been mistakes and failings. When I look back on my past it's all I see. When I look toward the future i
t's all I see. I truly am an idiot and a fuckup. I am often called a loser or other such things. No use in disagreeing with the
truth. Things could have been different if I had used my brain, but I'm clearly too stupid for that. I wish I could be saved, t
o be happy, and for others to be happy too.

If that makes any sense. I'm just constantly checking myself for symptoms, constantly worrying about panic attacks. I'm horribl
y afraid that I'm losing my mind. The worst thing is that thinking about it makes everything 10x worst, and all I can do is thi
nk about it whenever I'm alone. I feel disabled by my own mind. I feel like I've lost my freedom.

Adults tell me(m15) some funny life stories of yours, give me life advice, all that stuff. I'm also trying to stop procrastinat
ing so any advice on how to fix that would be great as well.

```python
In [32]: predict_tendency(t)
         predict_tendency(u)
         predict_tendency(v)
```

The model predicts the statement to be: Depressed
The model predicts the statement to be: Anxious
The model predicts the statement to be: Normal

```python
In [33]: accuracy = model.score(x_test,y_test)
         print("The accuracy of the model is: ",accuracy*100,"%.")
```

The accuracy of the model is: 89.52296032099866 %.

```
print(u)
```

My whole life has just been mistakes and failings. When I look back on my past it's all I see. When I look toward the future i
t's all I see. I truly am an idiot and a fuckup. I am often called a loser or other such things. No use in disagreeing with the
truth. Things could have been different if I had used my brain, but I'm clearly too stupid for that. I wish I could be saved, t
o be happy, and for others to be happy too.

In [14]:
```python
def predict_tendency(x):
    x = get_clean(x)
    vec = tfidf.transform([x])
    if model.predict(vec)[0] == 1:
        print("The model predicts the statement to be: Suicidal")
    else:
        print("The model predicts the statement to be: Fine")
```

In [15]:
```python
predict_tendency(t)
predict_tendency(u)
```

The model predicts the statement to be: Suicidal
The model predicts the statement to be: Fine

In [16]:
```python
accuracy = model.score(x_test,y_test)
```

The accuracy of the model is: 92.37938596491229 %.

1

SOCIAL MEDIA ANALYSIS

People tend to vent their emotions on social media which can be captured and analyzed by our models.

2

CONVERSATION ANALYSIS

For those who feel shy on social media but confide in their friends and dear ones through text conversations, we also have a method wherein WhatsApp chats can be analyzed. *Side Note: We don't store any conversation.*

3

DOING AWAY WITH HESITATION

People tend to hesitate while seeing a doctor or a therapist in which case they can either understand what they might have on their own or someone who cares about them can do the same and then urge them to try therapy.

4

BACKED BY EXTENSIVE RESEARCH

1. 'Schizophrenia Detection Using Machine Learning Approach from Social Media Content' by Yi Ji Bae 1, Midan Shim 1,2 and Won Hee Lee 1 published on 3 September 2021
2. 'Not Just Depressed: Bipolar Disorder Prediction on Reddit' by Ivan Sekuli´c Matej Gjurkovi´c Jan ˜Snajder published on 27th March 2019

Business Model

Problem	Solution	Unique Value Proposition	Unfair Advantage
How can AI enable a sustainable future?	Mint is a voice enabled and multilingual application for adolescents, adults and PWDs to detect mental health issues and aid people in managing them.	1. The application is entirely voice enabled. 2. Passwordless authentication. 3. Art therapy. 4. Available in multiple regional Indian languages.	The top mental health applications currently are based out of countries not from India. As an extension to the KIRAN facility provided by the Indian govt., Mint will prove to be an asset for regional speakers, adolescents and PWDs.
Existing Alternative 1. Moodfit 2. Raahee 3. Talkspace However, no application is using ML algorithms for the detection, no app is available in regional Indian languages and no app is voice and passwordless enabled.	**Key Metrics** 1. Number of people using the application. 2. Number of people engaging in therapy sessions. 3. Media attraction.	**High Level Concept** Mint is a holistic application which offers its users most of the technologically possible features which can aid in their mental health disease detection and management.	**Channels** 1. Influencer marketing 2. Mint student community 3. Promotion in competitions and hackathons. 4. Social media marketing. 5. Print media marketing.
Cost Structure <u>Fixed Costs:</u> Cloud platform costs, employees, electricity, internet, marketing and advertising <u>Variable Costs:</u> Sponsorships, temporary employees, giveaways.	**Customer Segments** 1. Adolescents 2. Adults 3. Technically challenged individuals 4. Elder individuals 5. Persons with disabilities (PWDs)	**Revenue Stream** Mint has a subscription based model. Levels of subscription: 1. Premium Users: Full access to all features. 2. Free Users: Limited access to all features + 14 Day Premium Trial. 3. Pay-per-use of services	

Revenue Model

Free Services

Single user art therapy

Using voice assistant

Multilingual support

Detection of Anxiety and Depression (RSS Feed only)

Detection of Schizophrenia (RSS Feed only)

Detection of Bipolar disorder (RSS feed only)

Activity and Health visualisation

Music Recommendation

Subscription based

Monthly: ₹4999/-
Quarterly: ₹13999/-
Biannually: ₹28999/-
Annually: ₹54999/-

Multi user collaborative art therapy

Using voice assistant

Multilingual support

Detection of Schizophrenia, Bipolar disorder, and Anxiety and Depression (both RSS Feed and WhatsApp text extraction)

Activity and Health visualisation

Sharing of health reports with the therapist

Full access to Tic Tac

Real time location tracking and habit analysis

Music Recommendation

4 group therapies per month

2 video chats with the doctor per month

Pay-per-use

Group Therapy

₹499/- for a single group therapy session

₹799/- for 2 group therapy sessions

₹4299/- for 10 group therapy sessions

Talking to a Doctor

₹999/- for first 60 minute video chat with the doctor

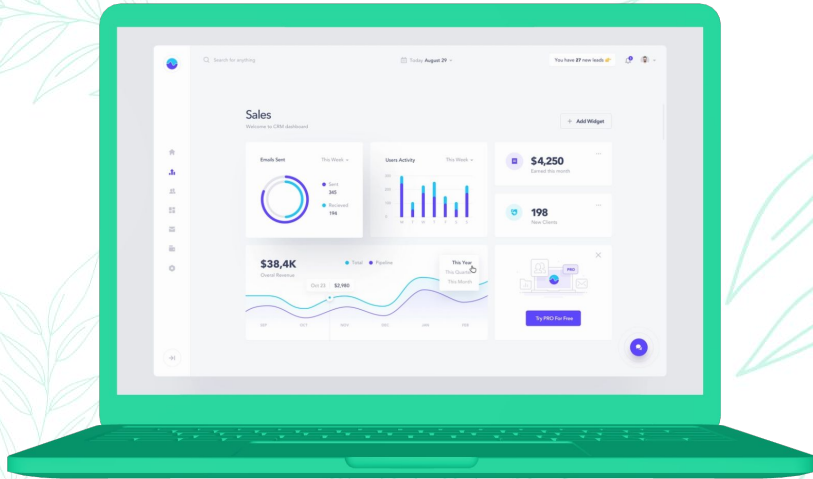₹699/- for subsequent 60 minute video chat with the doctor

Collaborative art therapy

₹299/- for 60 minute use

Future Scope

What's Next for Mint?

The Minty Dashboard

Intuition: Data visualisation helps users analyse their activities and helps them to improve / change any habit they are undertaking. It is a compiled report of the different activities and features that the user is using on the app. This report can be used by the user directly or provided to their doctor.

The report will contain:

1. Record of user visiting different places.
2. Record of user taking their medications on time.
3. Record of user exercising.
4. Record of user spending time listening to music.
5. Record of user spending time on the support group channel.
6. Record of user spending time doing art therapy.

Dashboard

MENTAL HEALTH

- Dashboard
- Disorder Detection
- Real-time Location
- TicTac
- Mint Health
- Mint Art Therapy
- Mint Playlist
- Settings
- Logout

Last Visited Places

Daily ▼

12:23 PM	**Indira Gandhi Delhi Technical University for Women** Kashmere Gate, Delhi
12:13 PM	**Kashmere Gate Metro Station** Kashmere Gate, Delhi
12:02 PM	**Inderlok Metro Station** Inderlok, Delhi
11:47 PM	**Pitampura Metro Station** Pitampura, Delhi
11:23 PM	**Rohini West Metro Station** Rohini West, Delhi
11:15 PM	**Home** Rohini West, Delhi

Serotonin Boost Playlist
Go to my playlist

Euphoria
BTS

0:40   2:35

My Grooving Hours

You've listened to music for 2 hours, which is 1 hour less than yesterday

Tip: Curate a playlist based on your mood in the Mint Playlist section

My Medications

Ibuprofen 50mg
🕐 1:00 PM
Cancel Reminder

Aspirin L 20mg
🕐 3:00 PM
Cancel Reminder

Exercise Routine

◀ 🏋 ▶

Strength Training
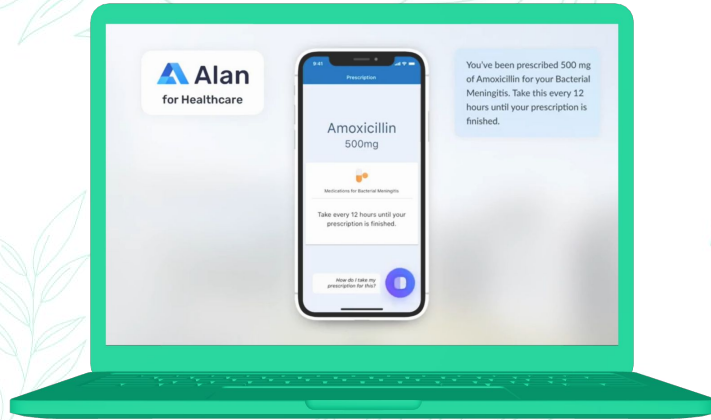
- Idle
- Strength Training
- Light Exercise

My Support Hours

Time
01 : 27 : 03
Hour   Minute   Second

My Art Therapy Hours

Time
00 : 41 : 47
Hour   Minute   Second

Minty: The Voice Assistant @Mint

Intuition: Considering our users belonging to the PWD group, with the help of **AlanAI**, the entire application can be accessed without navigating manually but by voice activated commands. With the growth of voice assistants, voice UX is a new paradigm that our application will shift to.

Use Cases:

1. PWD can easily access the application without having to operate it manually.
2. Users belonging to the older age group and / or users belonging to the technically challenged group can use the application easily.

Important Links

S.No.	Title	Link
1	Demo Video	<to be added>
2	GitHub Repository	<to be added>
3	Sources	'Schizophrenia Detection Using Machine Learning Approach from Social Media Content' https://www.mdpi.com/1424-8220/21/17/5924
		'Not Just Depressed: Bipolar Disorder Prediction on Reddit' https://arxiv.org/abs/1811.04655