Requirement analysis

Scope - about the app:
The app should be easy to use and should make the day to day life of these persons much easier. The scope is they can manage to do different daily tasks easier by themselves with the help of the app.

Limitations - about the app:
The feedback the application should return only can provide indications or interaction with the smartphone but will not be able to help people with everything in their daily activities, such as taking a meal or being able to climb the stairs or even driving. Human life is limited in this case from some activities and others can be hard to make.

Client:
Visually impaired and blind people.

Client's needs:
These people need an application that can manage different human interactions with the smartphone like speech and touch gestures and provide feedback or results depending on the commands given by the users.

Client's requirements:
1. As a visually impaired person, I want to be able to listen to the text on my phone so that I can hear what is written on the screen.
2. As a user, I want to be able to write text so that I can send messages easier.
3. As a user, I want to talk with the phone so that I can perform different commands using my voice.
4. As a user, I want to have the ability to increase font size so I can see better.
5. As a user, I want to know the details of objects around me such as color, size and names so that I can be aware of what is next to me.
6. As a user, I want to be able to know what date and time it is so that I can keep track of time.
7. As a user, I want to know what the weather is like so that I can go outside dressed properly.
8. As a user, I want to be able to know what is written on different objects so that I can be more informed.
9. As a user, I want to be able to know the expiration date of different food so that I can eat fresh.
10. As a user, I want to be able to use my phone normally so that I can do different tasks like opening and closing apps and using the applications already installed easier.
11. As a user, I want to be able to set reminders that I can hear so I can keep track of the tasks I have.

12. As a user, I want to be able to hear braille text so that I know what is written if I can't touch the text.
13. As a user, I want to be able to take the bus easier so that I can go around the city.
14. As a user, I want to be able to record notes and listen to them so that I can have important information with me.
15. As a user, I want to know how much battery I have left so that I will be able to charge my phone when it is needed.
16. As a user, I want to know what notifications I have by hearing them, so that I will know if there are important things I received.
17. As a user, I want to know where I am going by using maps so that I will not get lost.

Functional requirements:

1. The application shall be able to perform different tasks given by the user without glitching.
2. The application shall be responsive.
3. The application shall perform tasks in real time.
4. The app shall send messages when a user wants to.
5. The app shall call people when a user wants to.
6. The app shall give information about date and time when a user asks for them.
7. The app shall give information about the weather when a user wants to know.
8. The app shall open/close other applications when the user wants to.
9. The app shall use the camera when the user wants to know what is around them.
10. The app shall recognize objects and their details in images telling the user the information loudly.
11. The shall transform speech to text when the user wants to write something.
12. The app shall transform text to speech when the user wants to hear what is written.
13. The app shall magnify text when the user can not see very well.
14. The app shall provide information for directions and places where the user wants to go.
15. The app shall use navigation maps.
16. The app shall use GPS.
17. The app shall make a beep sound at the opening.

Actors:

Humans, software elements (programs that processes the data received and delivers an output like text to speech or speech to text, a voice task to a smartphone command, location inputs and future directions etc.), hardware elements(smartphones).

Stakeholders: blind people, developers, free software companies

- Magnify text and objects: The app will use the camera to help the user see small text and/or objects by zooming in on them and eventually using the camera flash to add more clarity. The magnitude of the zoom and the usage of the flash will be selectable by the user.
- Color mode for people with color problems (green to red etc): The app will use the camera again to get an image and manipulate it to help the user better differentiate colors and objects. This can also be customizable for different types of colors and severity.
- Color blindness: Unlike the previous point, color blindness could mean the complete lack of colors, so just a color correction won't be enough. In this case, the app will try to make changes to the shapes, contrasts or tell the user the colors that are in the image, in case of traffic lights, for example.

- Perform command to open/close apps and do different tasks in the apps(read from messenger, chrome etc): The app should open and close different important apps and provide a way for the users to interact easily with them and their functionalities. It will be done by pronouncing specific commands like: "open chrome", "close messenger", "read titles", "write <something>".
- Read notifications: The app will provide real time notifications to users. When a notification comes, a sound will pop up and then the user can pronounce: "read notifications". After this command, the app will start reading the notifications in chronological order. The user can stop the reading by saying: "stop" and he can come later to read the remaining ones.
- Maps / GPS: Navigation map: The app will use GPS and some free maps like OpenStreetMap(it is an open date, free to use and we only need to credit them) or the app will use Google Maps API for performing tasks as: finding the exact position of the user plus additional informations about the streets and places around him. Also, the map together with the GPS will help the app to provide the directions the user needs to take to reach the destination. These commands will be like the following: "go to Copou", "go Home", "street", "location", "next direction".
- Easy to use interface: The app will provide a very simple interface and it will be composed from a few buttons (max. 2) dividing and occupying the screen in 2. They will be easy to use and when a user will press one of them the app will make a specific sound depending on the pressed button.

- Handwriting recognition: In a noisy environment, or if someone doesn't feel like talking aloud, the app will be capable of understanding handwritten letters and sentences. This will allow people to fully interact with their phone in an alternative manner.
- Ask general questions like: weather, battery, time, date etc. Use the phone to find out basic things like time, date, year, weather.

- Call, call history, sms write and read using voice: Ask the phone to call someone, to create a new contact, write a sms or read sms'. You can also listen to voicemail and find who called you.
- Set audio alarms or voice memos: Users can easily save and listen to memos using voice. They can also set alarms, snooze, or close them.

- Text to speech and speech to text: The user will give a specific command to the app depending which task he wants the app to perform, for example "write a message" or "read the notifications". The app will have to listen and transform the speech to text or read the text and give an audio output based on the text.
- Image recognition: colors, objects, people, emotions, animals, text etc.: The app will open an image/open the camera and will perform an analysis based on what it is in the picture. Based on a command from the user, for example "what's in the image" or "what colors are there" and on what it has found, an audio output will be given to the user that will tell them what objects are there or what colors.
- Location based information: places, directions, distances: Based on a specific command "directions" or "current location" or "details about place x" the app should be able to communicate with gps and receive the location. For "directions" it should give an audio output to inform the user it is waiting for the next command to receive for example "from x to y" and then create the route and tell it to the user loudly. The app should be able to identify places and match them on the map. For "details about place x" the app should be able to tell the user what he can find around, if there are any bus/tram stations, restaurants, pharmacies.
- Read braille text from image: based on a given image the app can recognize the braille text, process the image and output an audio that is saying the text. This will be triggered by a specific command given by the user like "read braille".

To be implemented:

- basic info (location, battery, note taking, time(hour/date), alarms) (mihnea) https://www.draw.io/?lightbox=1&highlight=0000ff&edit=_blank&layers=1&nav=1&title=UseCaseTAIP.drawio#Uhttps%3A%2F%2Fdrive.google.com%2Fuc%3Fid%3D1dqxfpQlsj3HS6SXNco7zY3E3XULL62-v%26export%3Ddownload
- calls and sms diagrams (vlad)
- directions (andra) https://viewer.diagrams.net/?highlight=0000ff&edit=_blank&layers=1&nav=1#G1mAWXMZY_7-ghyOZLoUg_SGyCR6RoRJ5_

  https://viewer.diagrams.net/?highlight=0000ff&edit=_blank&layers=1&nav=1#G13n9Ee8xSkqrOvdO15PaE0mSc3BHXVrCo
- image recognition diagrams (cosmin)