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ABSTRACT

Blind stick is a special device used by visually disabled people for centuries. But in recent times Electronic Travel Aids (ETAs) with sensors and sound system are designed for Improved navigation of blind people. Here we proposed an advanced Smart Blind Stick that allows visually challenged people to navigate using advanced technology like Arduino Uno, Ultrasonic-Sensors and Buzzer.

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1. Introduction:

1.1 Introduction:

According to the famous philosopher and scientist Aristotle, our knowledge about the outside world depends on five sense organs and sight is one of those five organs. And visually-impaired are those unfortunate people who are completely or partially suffering with eye sight issues. According to the survey of World Health Organization (WHO) and International Agency for Prevention of Blindness (IAPB), approximately 285 million people around the world are visually –impaired among which 39 million are completely blind. Blind stick is a special device used by visually disabled people for centuries. But in recent times Electronic Travel Aids (ETAs) with sensors and sound systems are designed for improved navigation of blind people. Here we proposed an advanced Smart Blind Stick that allows visually challenged people to navigate using advanced technology like Arduino Uno, Ultrasonic sensors and Buzzer.

1.1.1 Project Summary:

Smart Blind Stick that allows visually challenged people to navigate using advanced technology like Arduino Uno, Ultrasonic sensors and Buzzer.

1.1.2 Purpose:

The purpose of a smart blind stick is to help people who are blind or have low vision move around safely and independently, and to improve their mobility and access to the world around them.

1.1.3 Scope:

- The future scope of the existing smart stick, guides the visually impaired person in his Navigation.
- One stick to communicate with another mobile , PCs nearby to utilize the functionality
- Project can be further enhanced by Using GPS and Voice Assistant.

1.1.4 Objectives:

- Help user to walk confidently.
- To prevent any collisions with human/object.

1.1.5 Technology and Literature Review:

Hardware Technology used:

- Arduino Uno
- Ultra sonic Sensors
- Buzzer
- Battery
- Bluetooth Module

Software Requirements:

- Arduino Uno
- Android Application to voice assist the user

2. AEIOU Canvas Sheet:

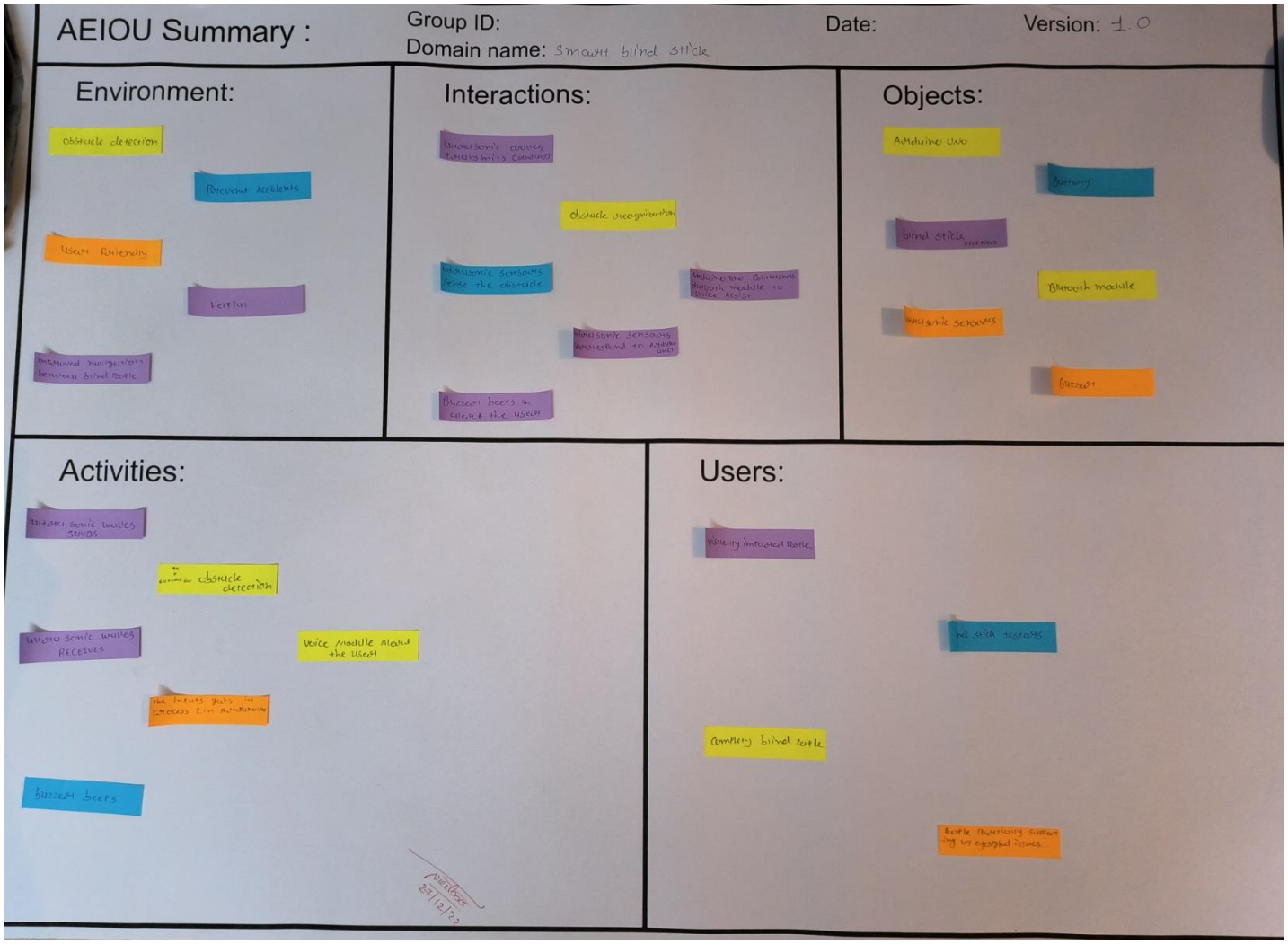


Fig.1-AEIOU Canvas Sheet

2.1 Activities

- Ultrasonic Waves Send
- Obstacle Detection
- Ultrasonic Waves Receive
- Information in process (in Ardiuno)
- Buzzer Beep
- Voice Module to Alert User

2.2 Environment

- Obstacle Detection
- Helpful
- User Friendly
- Prevent Accident
- Improved Navigation of Blind People

2.3 Interactions

- Buzzer Respond to user
- Ultrasonic's Waves Transmits (Send/Reivce)
- Ultrasonic Sensor Correspond to Arduino Uno
- Arduino Command Bluetooth Module to Voice Assist

2.4 Objects

Objects of AEIOU canvas are Buzzer, Ultrasonic Sensor, Stick, Arduino Uno, Bluetooth Module, Battery.

2.5 Users

Visually impaired people, Completely Blind people, Partially suffering with eye sight issue.

Mind Mapping Canvas:

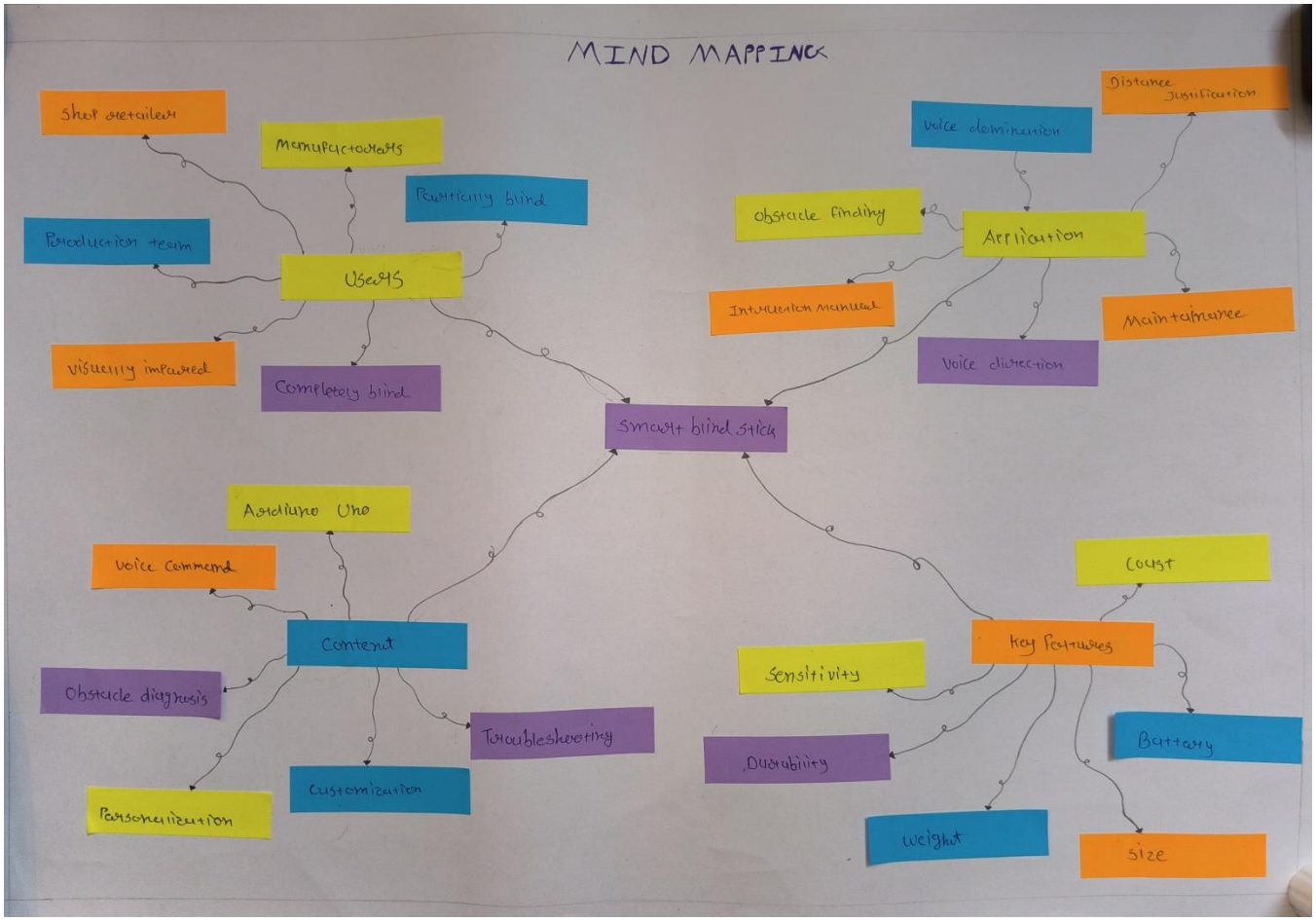


Fig.2-Mind Mapping Canvas

Empathy Mapping Canvas:

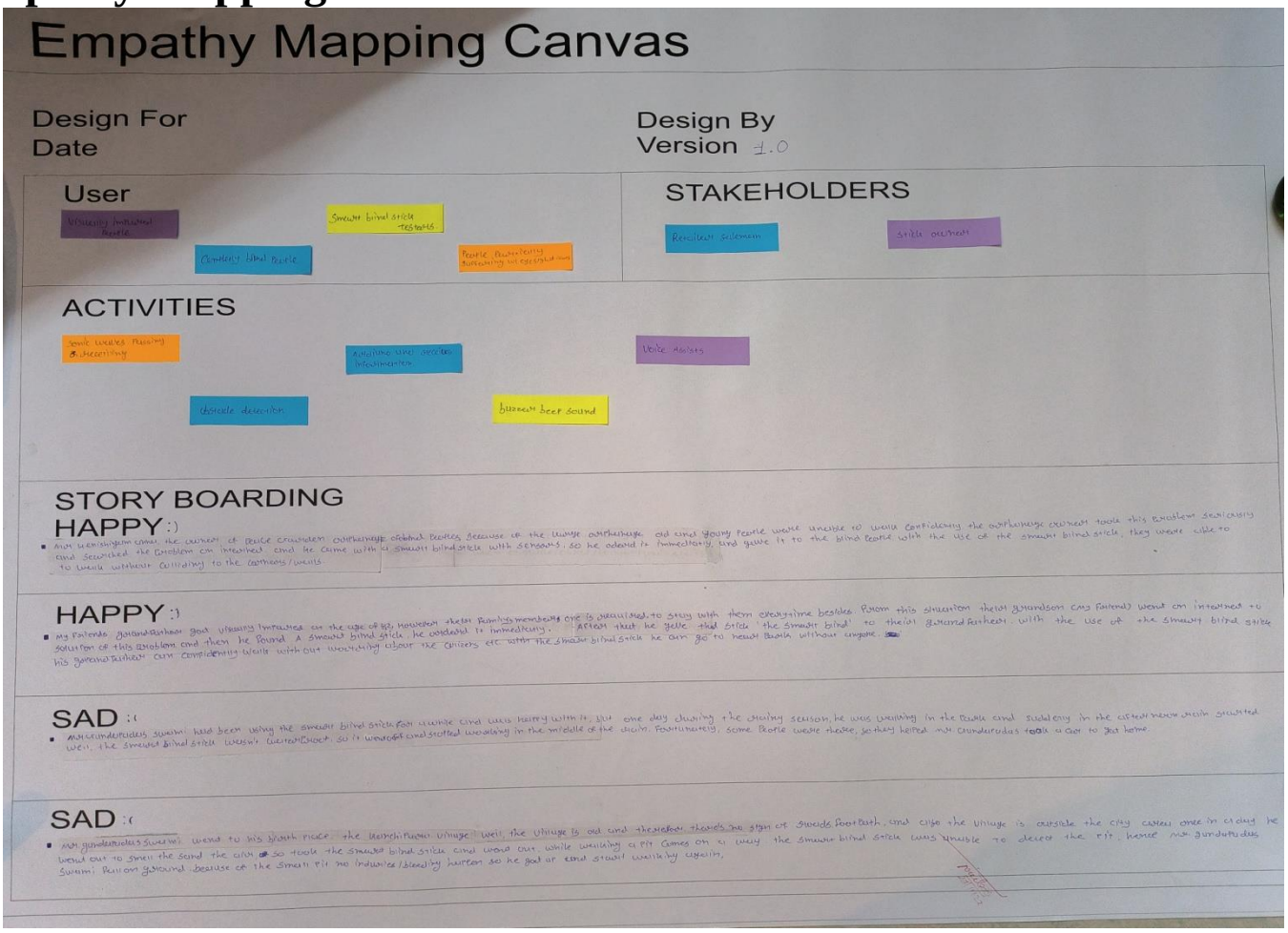


Fig.3- Empathy Mapping Canvas

In Empathy Mapping Canvas we have described the user of our Smart Blind Stick which will directly use the stick. Also there is happy story and sad story showing howpeople will get used to our Smart Blind Stick.

3. Ideation Canvas:

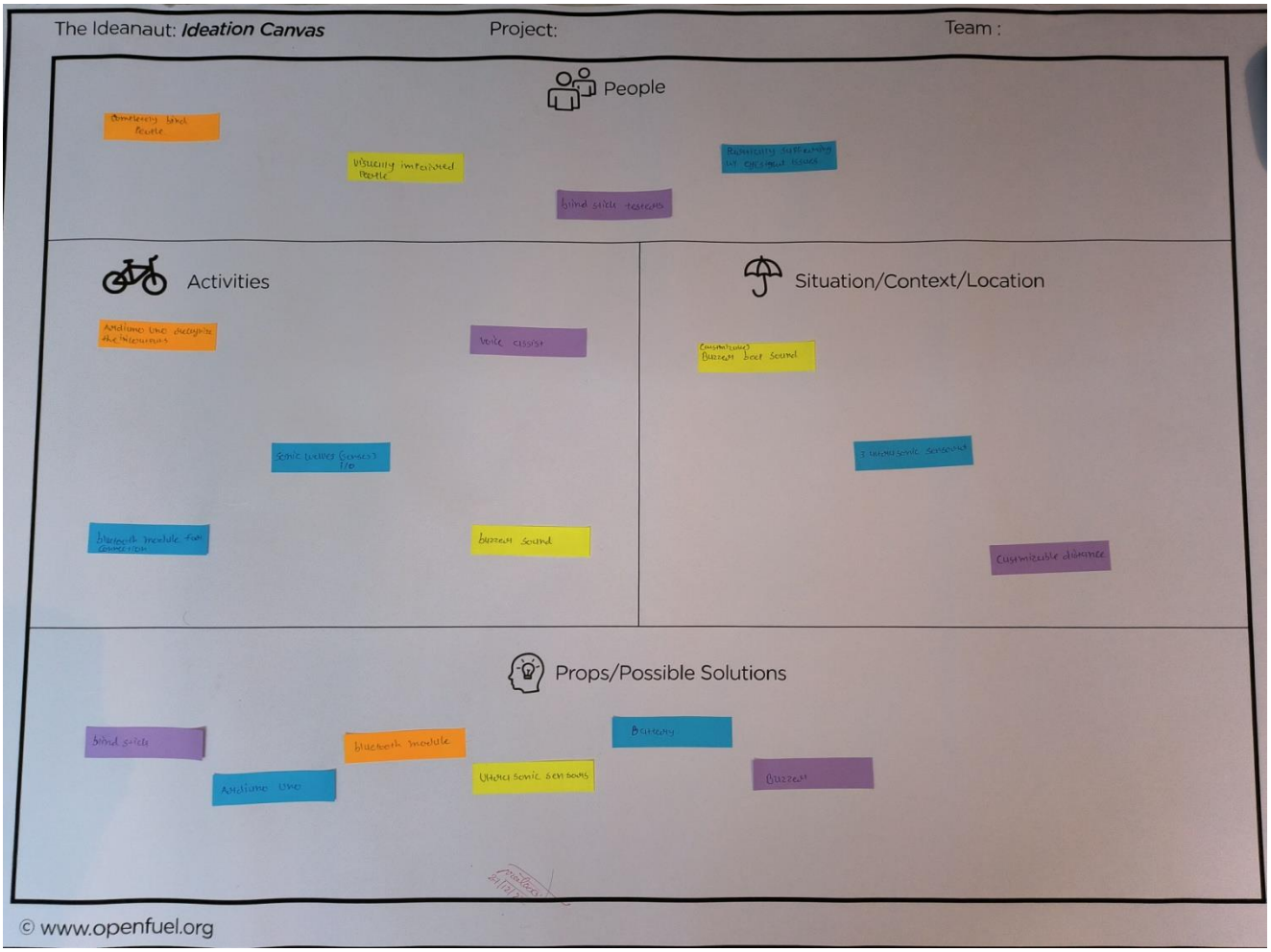


Fig.4-Ideation Canvas Sheet

At this stage we'll expand our list of user activities to list all possible new situations, conditions that the user faces or may face. Focus on expanding the activity list at this stage using ideation canvas at this stage. Ideation canvas is attached in append.

4. Product Development Canvas:

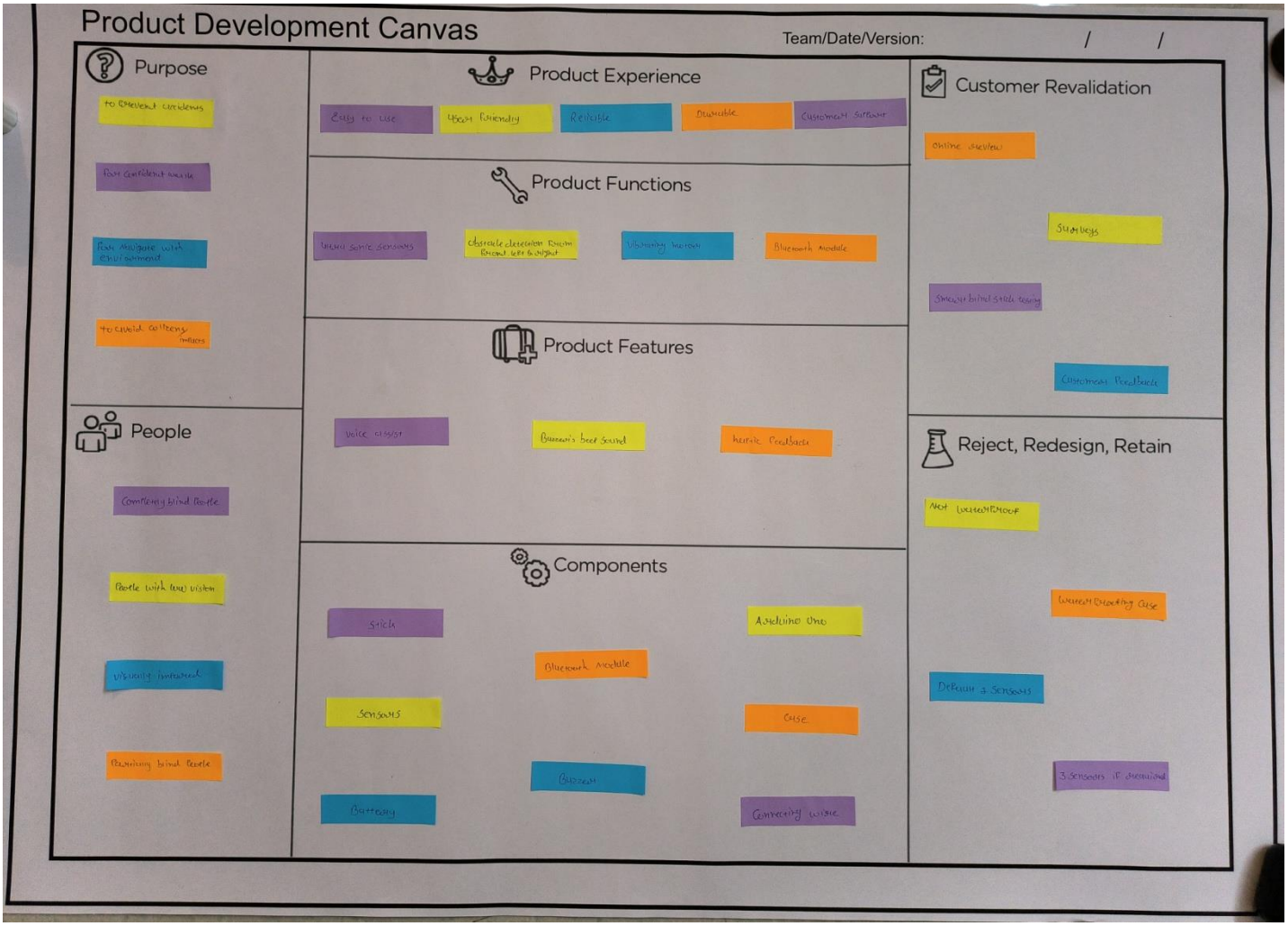


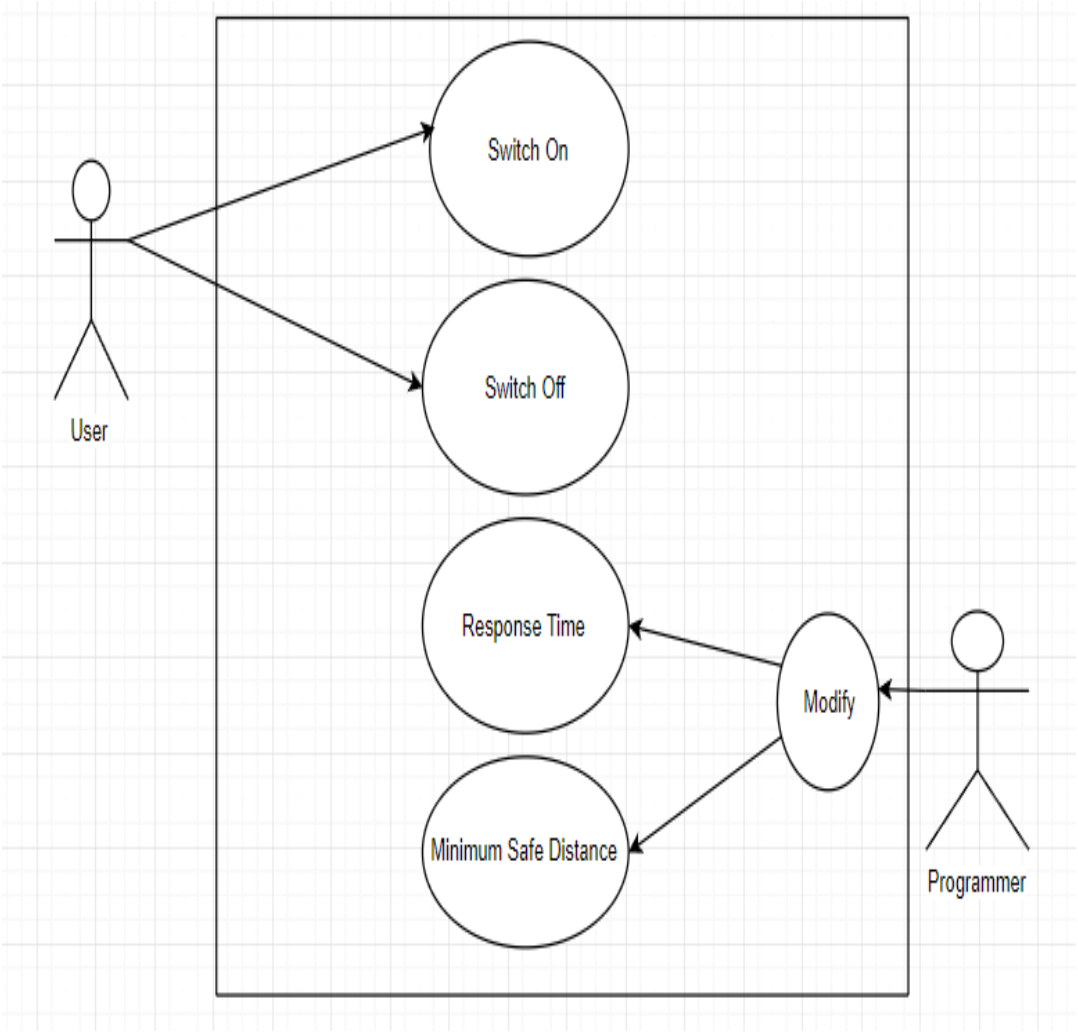
Fig.5-Product Development Canvas

Product canvas will require us to start building a structure of our product around the emotions needs of the user. Building solutions around the emotive needs of users is central to design thinking.

SIMULATION AND ANALYSIS :

Use Case Diagram:

6)



7) Sequence Diagram:

Sequence Diagram

Fig 8 :Sequence Diagram

8) Activity Diagram

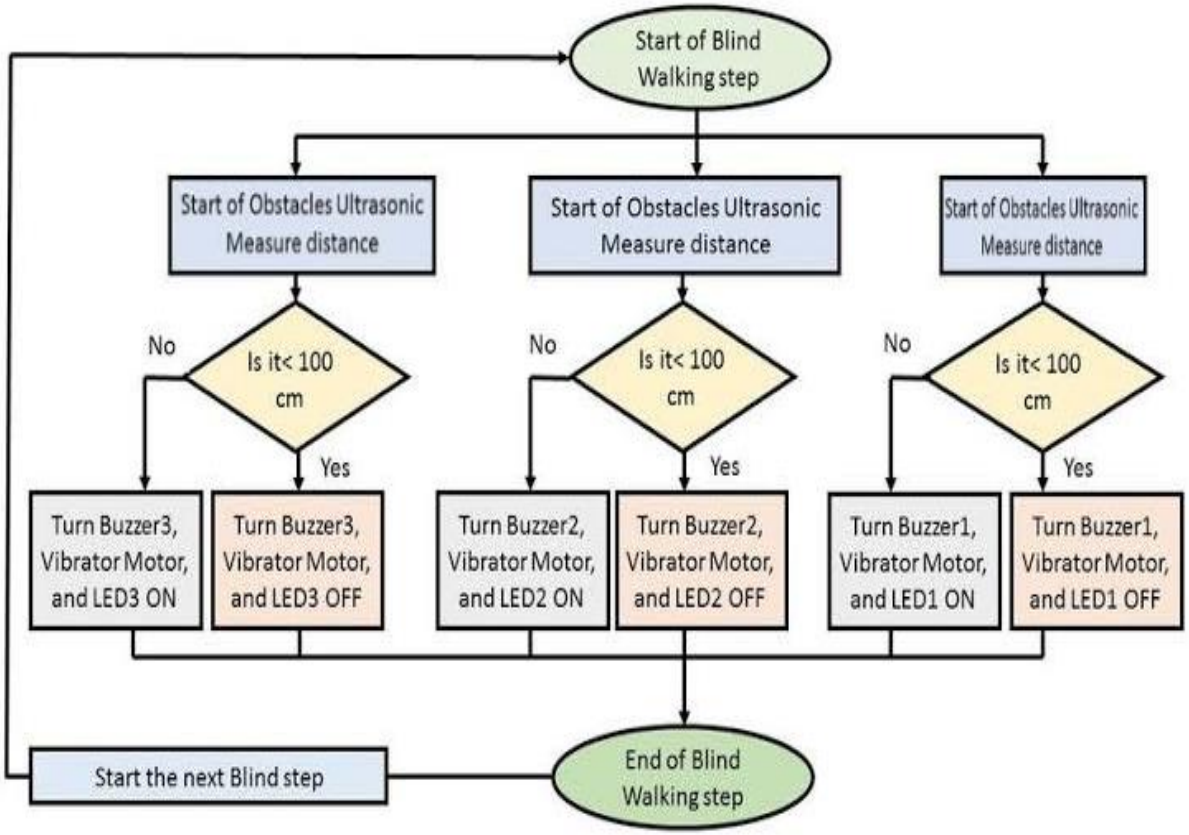


Fig 9: Activity Diagram

9) ER Diagram:

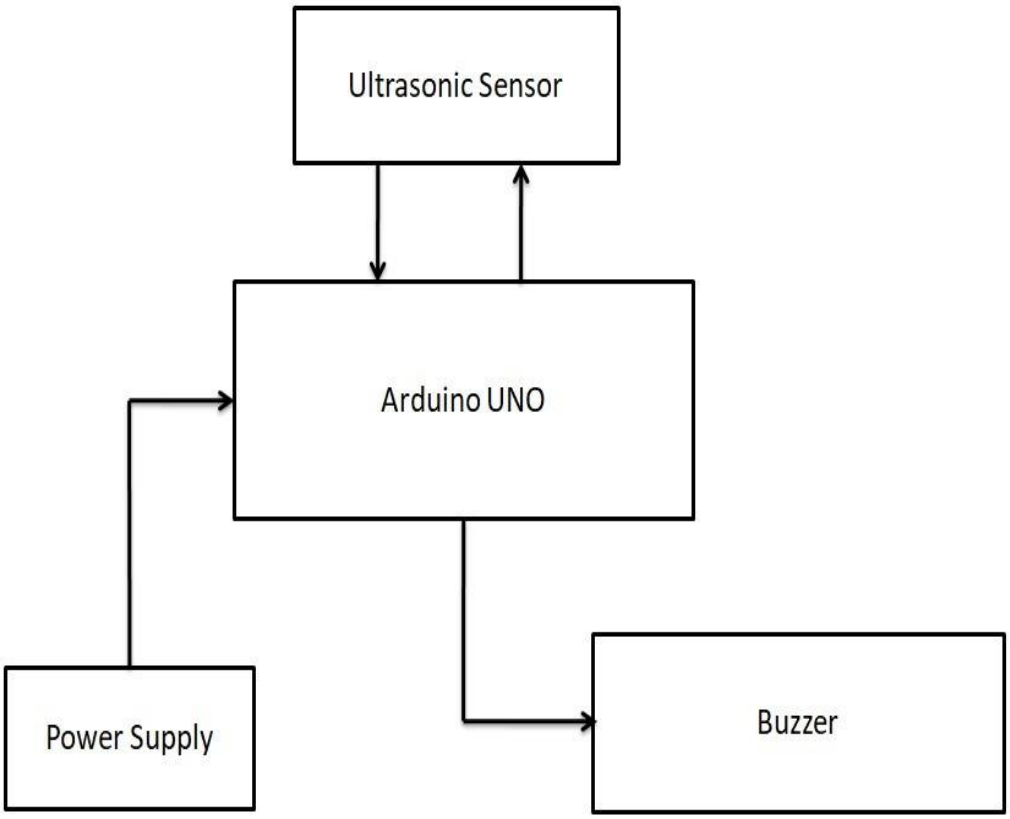


Fig 10 - ER Diagram

10) PROTOTYPING:

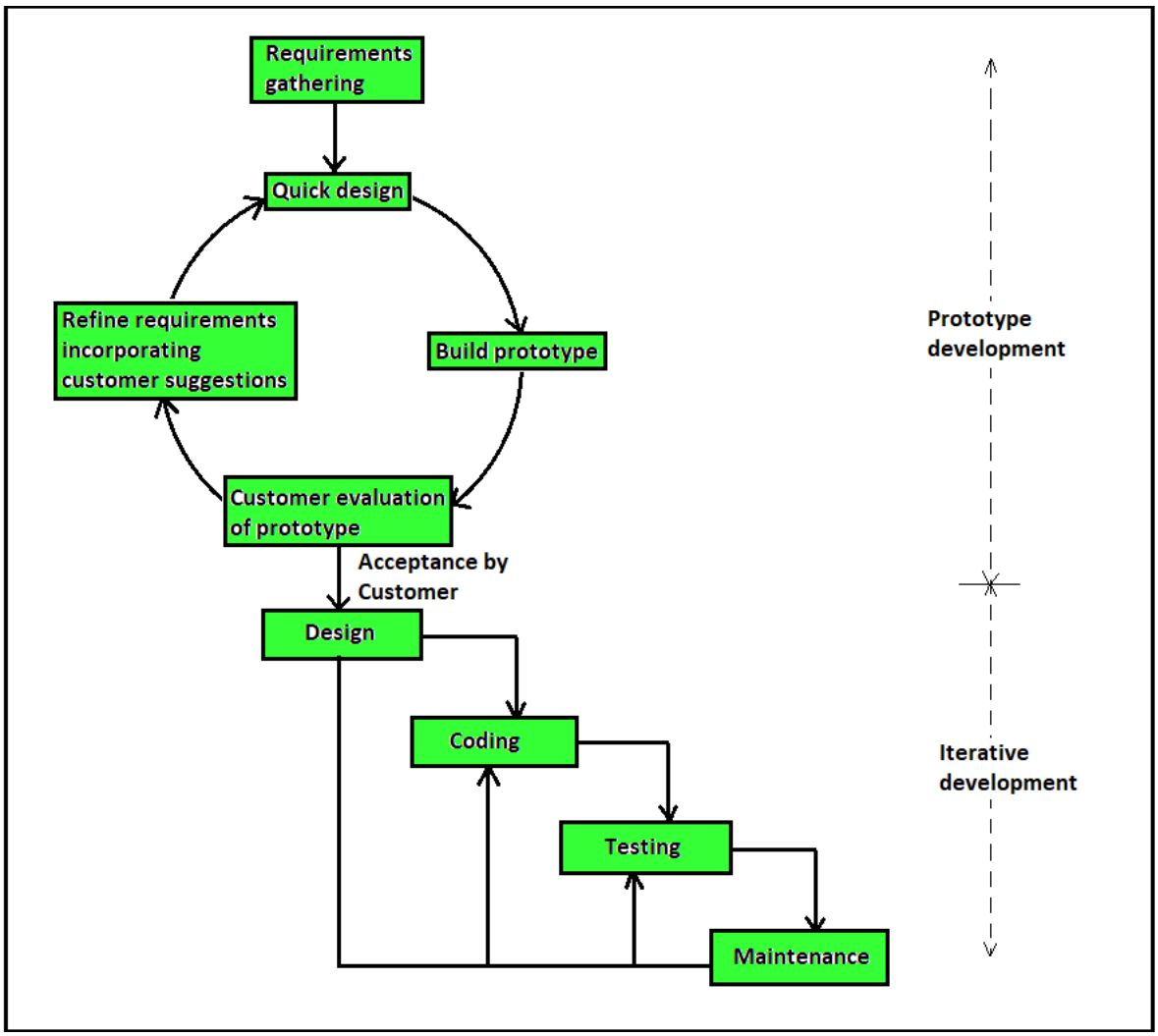


Fig. 11.1 Prototyping

12. Conclusion

A smart blind stick can provide a significant increase in independence and mobility for individuals who are visually impaired, as well as increase the safety while walking around. it's worth noting that smart blind stick development is a ongoing research field, with new advances and improvements being made all the time, and thus, the conclusion is that there is a lot of potential for future development to improve this technology for the people who rely on it.

13. REFERENCE:

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iii. Anon, n.d. Electronic Walking Stick for the Blind, s. 1.:s.n.