GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad

Sarvajanik College Of Engineering And Technology , Surat

Report on –

SMART BLIND STICK

Under Subject of
DESIGN ENGINEERING – 1B
B. E. II , Semester – IV
(Electronics & Communication Branch)

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Head of the Department

SARVAJANIK COLLEGE OF ENGINEERING & TECHNOLOGY

(ELECTRONICS AND COMMUNICATION ENGINEERING)

CERTIFICATE

This is to certify that the dissertation entitled **" Smart blind stick "** carried out by ***Mohil jain, Gautam vatiani, Janvi shah, Shweta patel*** .has been done under my guidance in fulfilment of Design Engineering 1B in ELECTRONICS & COMMUNICATION ENGINEERING (4th semester) of Gujarat Technological University, Ahmedabad during the year academic year 2021-22

Prof. Vandana Shah — **(Faculty guide)**

Prof. Nehal Shah — **(Head of the Department)**

ACKNOWLEDGEMENT

Before putting a single word about the project, we would like to thank all those people who have directly or indirectly helped us in making our project and turn it into a successful piece of work. Many people have contributed in this project in a variety of ways. Words are not enough to describe their support to us. But still we would like to thank all of them.

Firstly we'd like to thank god and our parents who always motivate us to achieve our desired goal in life.

We also would like to thank our guides **Prof.Vandana Shah** and our HOD **Prof.Nehal Shah** who guided us as much as possible and giving us valuable information regarding to our project.

This project wouldn't have been successful without the constant help and motivation extended by our colleagues and friends who were always with us whenever we needed.

We are thankful to our electronics and communication engineering department for facilities that were provided to us in accessing the labs. It was a great experience where we learnt a lot of thing related to our field. We are indebted to all those who gave their precious reviews to us on our work and apologize if we have missed anyone.

Last but not the least, Thanks to **Sarvajanik College of Engineering and Technology** for giving us the platform for representing this project.

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Introduction

An Intelligent Mobility Cane, or Smart Cane is a cane designed for the visually impaired which can offer the user the ability to navigate their surroundings,
ratherthan simply avoid hitting things.
To record information about the obstacles presence in a road, active or passive sensors can be used. In case of a passive sensor, the sensor just receives a
signal. It detects the reflected, emitted or transmitted electro-magnetic radiation provided by natural energy sources. In case of using an active sensor, the sensor emits a signal and receives a distorted version of the reflected signal.
It detects reflected responses from objects irradiated with artificially generated energy sources. These kind of active sensors are capable of sensing and
detecting far and near obstacles. In addition, it determines an accurate measurement of the distance between the blind and the obstacle.

Motivation

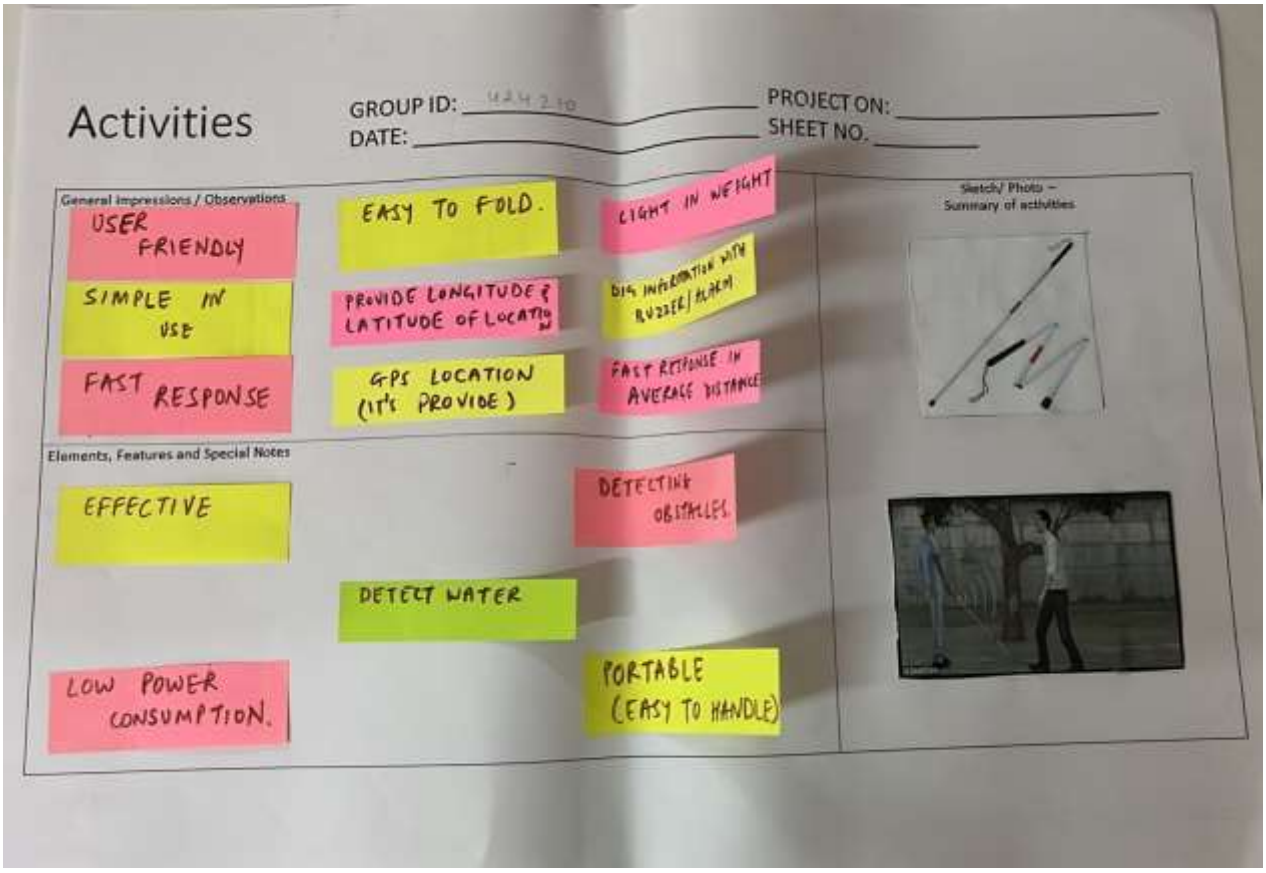
The mobility of blind people in unknown environment seems impossible without external help, because they don't have any proper idea about their surroundings. So, we are developing a smart walking stick which helps them to know about their surroundings and also guide them during travelling.

❖ Main aim of our project:

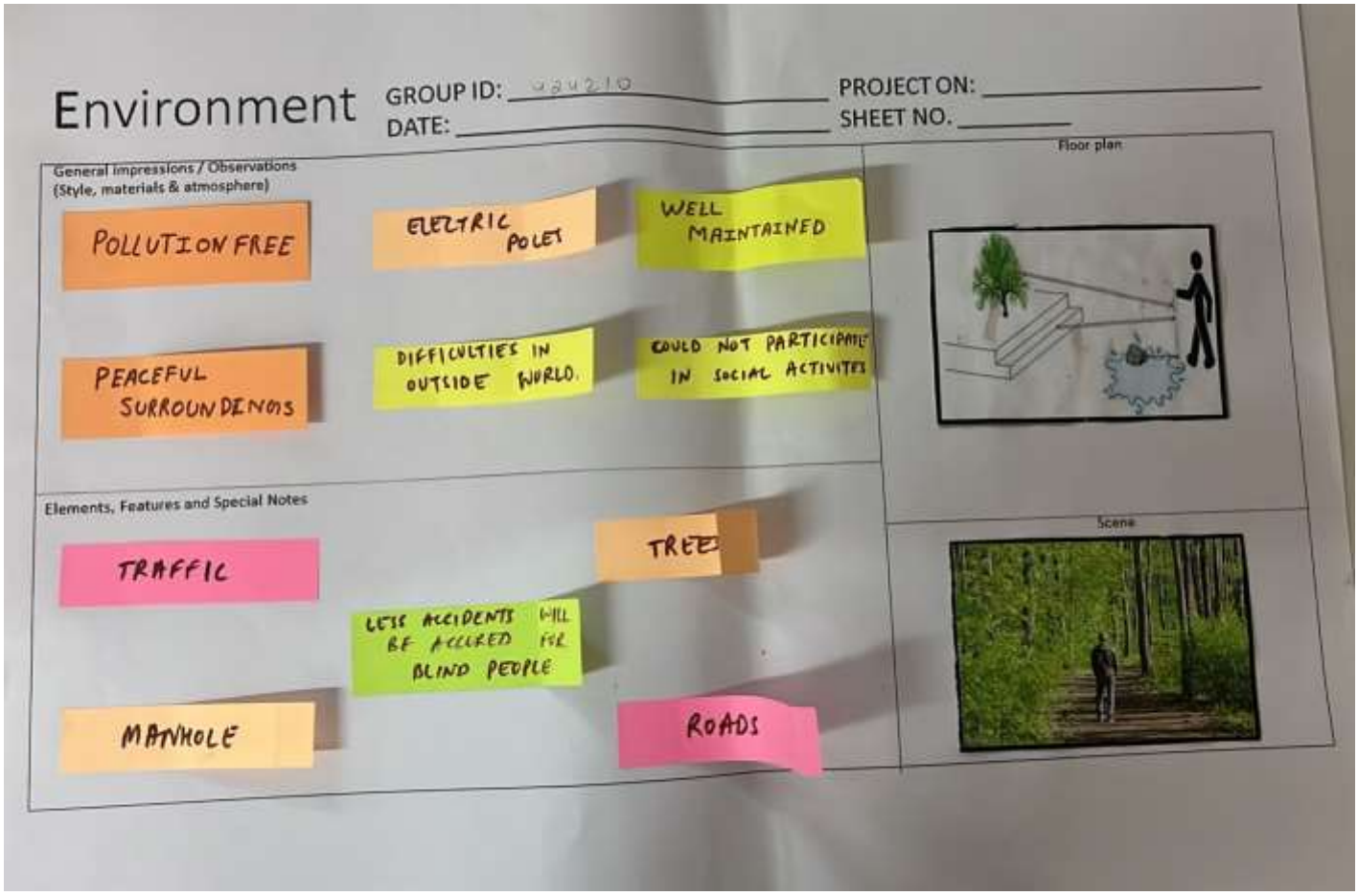
1. Blind people finding of way through a complex environment
2. The orientation and navigation for these people in unknown environment seems possible
3. Blind peoples are fearless or comfortable about independent mobility or travel

AEIOU Canvases :

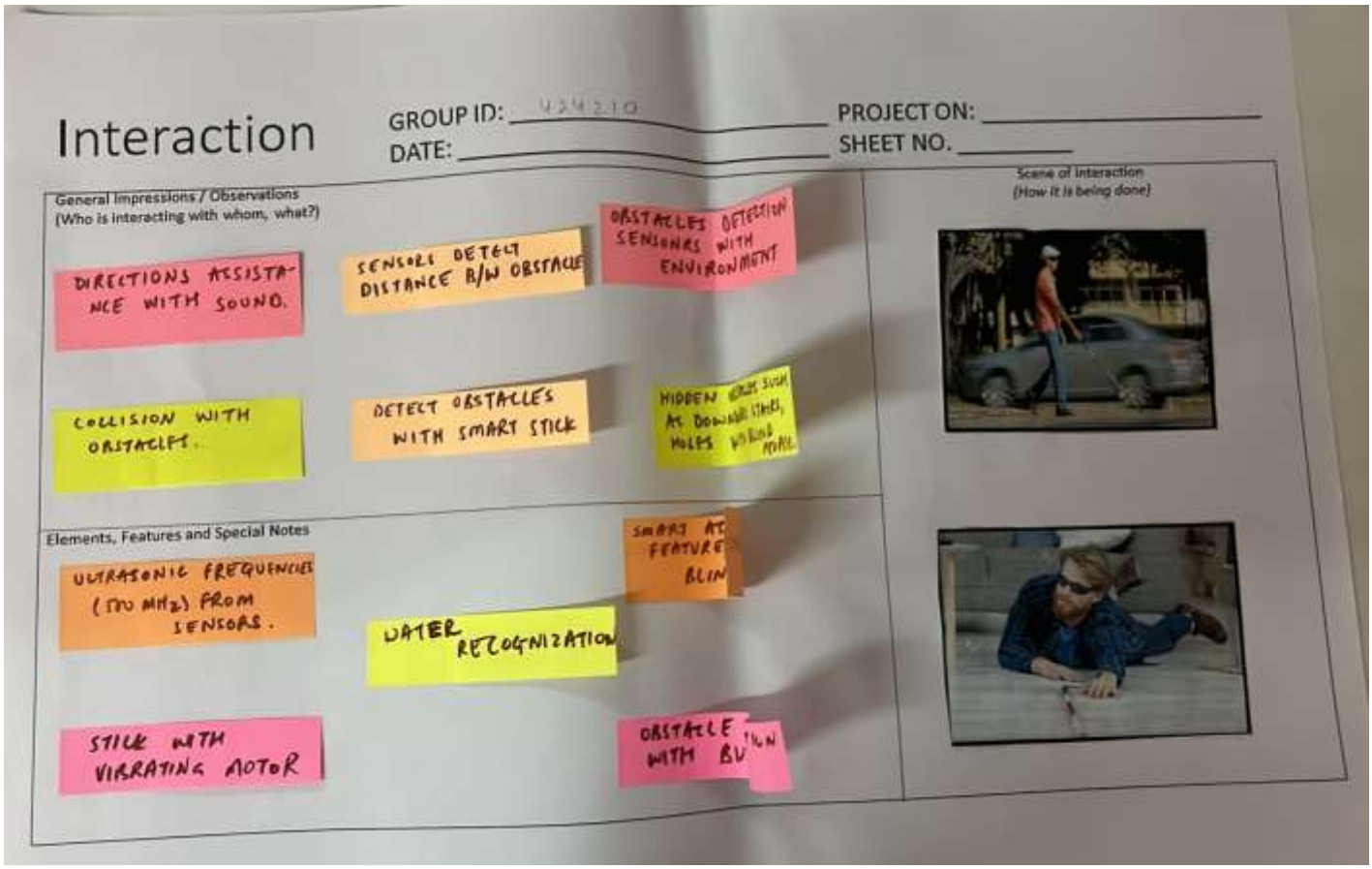
Activity :



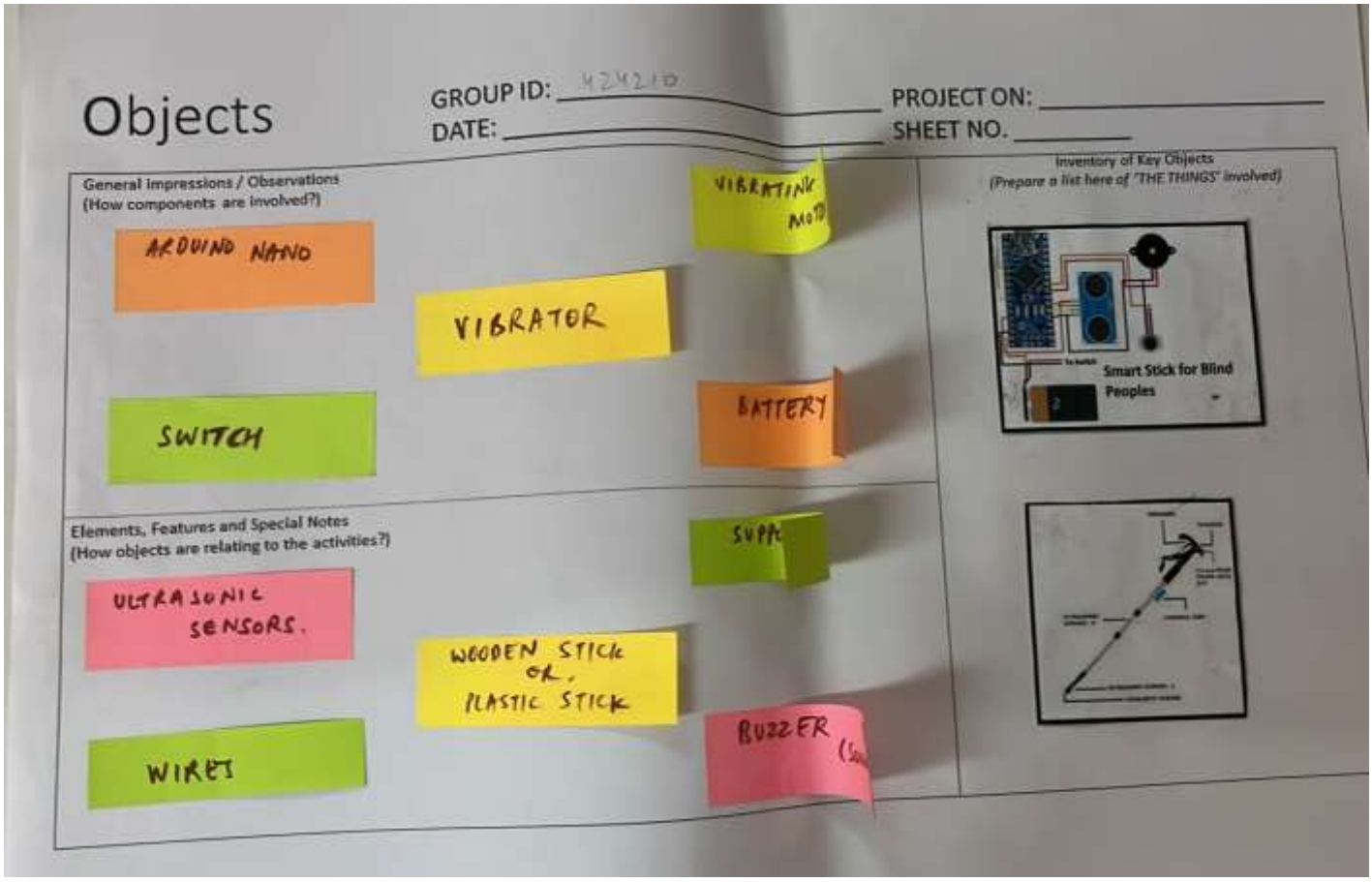
Environment :



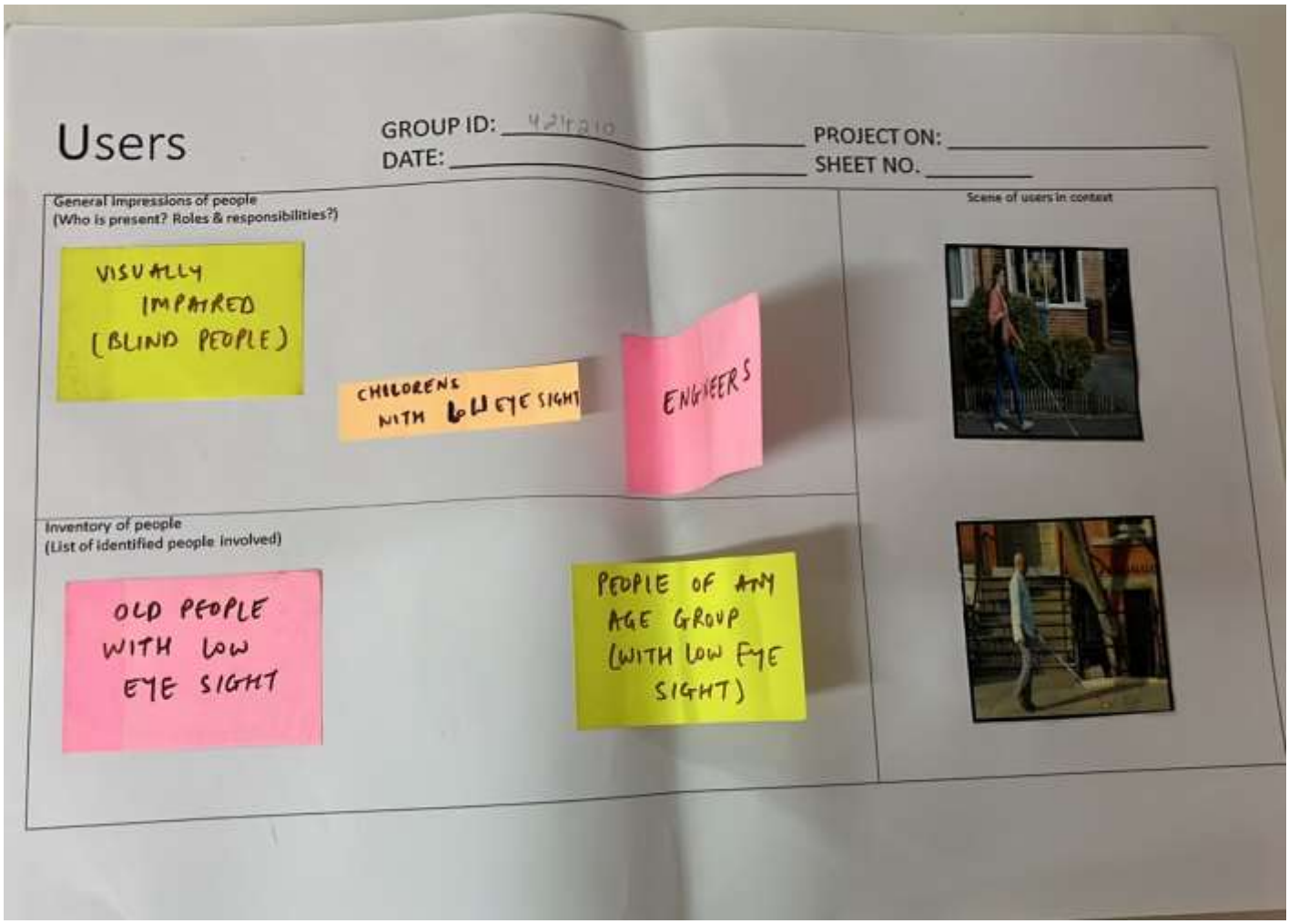
Interaction :



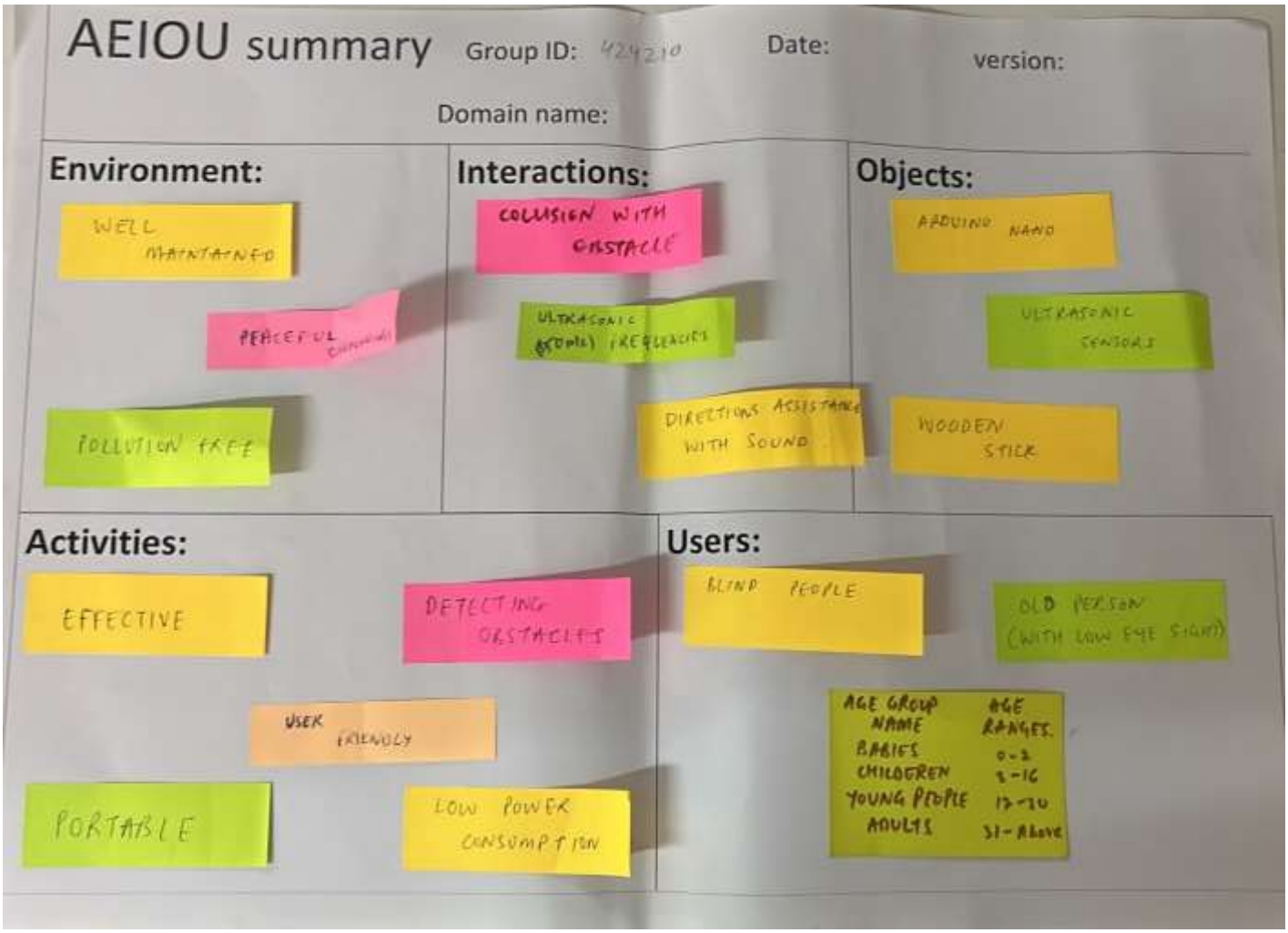
Object :


Objects
GROUP ID: 42421D
DATE:
PROJECT ON:
SHEET NO.
General Impressions / Observations
(How components are involved?)
ARDUINO NANO
VIBRATOR
SWITCH
BATTERY
VIBRATING MOTO
Elements, Features and Special Notes
(How objects are relating to the activities?)
ULTRASONIC SENSORS.
WOODEN STICK OR, PLASTIC STICK
WIRES
BUZZER
Inventory of Key Objects
(Prepare a list here of "THE THINGS" involved)
Smart Stick for Blind Peoples

User :


Users
GROUP ID: 42Ir210
DATE:
PROJECT ON:
SHEET NO.
General impressions of people
(Who is present? Roles & responsibilities?)
VISUALLY IMPAIRED (BLIND PEOPLE)
CHILDRENS WITH LOW EYE SIGHT
ENGINEERS
Scene of users in context
Inventory of people
(List of identified people involved)
OLD PEOPLE WITH LOW EYE SIGHT
PEOPLE OF ANY AGE GROUP (WITH LOW EYE SIGHT)

AEIOU SUMMARY



AEIOU SUMMARY

DOMAIN NAME: OBSTACLE DETECTION SYSTEM FOR BLINDS

ACTIVITIES:

- USER FRIENDLY
- EFFECTIVE
- PORTABLE (EASY TO HANDLE)
- LOW POWER CONSUMPTION
- SIMPLE IN USE
- FAST RESPONSE
- EASY TO FOLD
- DETECTING OBSTCLES

OBJECTS:

- WOODEN STICK / PLASTIC STICK
- ARDUINO NANO
- ULTRASONIC SENSORS
- BUZZER
- BATTERY
- SWITCH
- VIBRATING MOTOR

ENVIRONMENT:

- LESS ACCIDENTS WILL BE ACCRUED FROM BLIND PEOPLE
- POLLUTION FREE
- WELL MAINTAINED
- PEACEFUL SURROUNDINGS

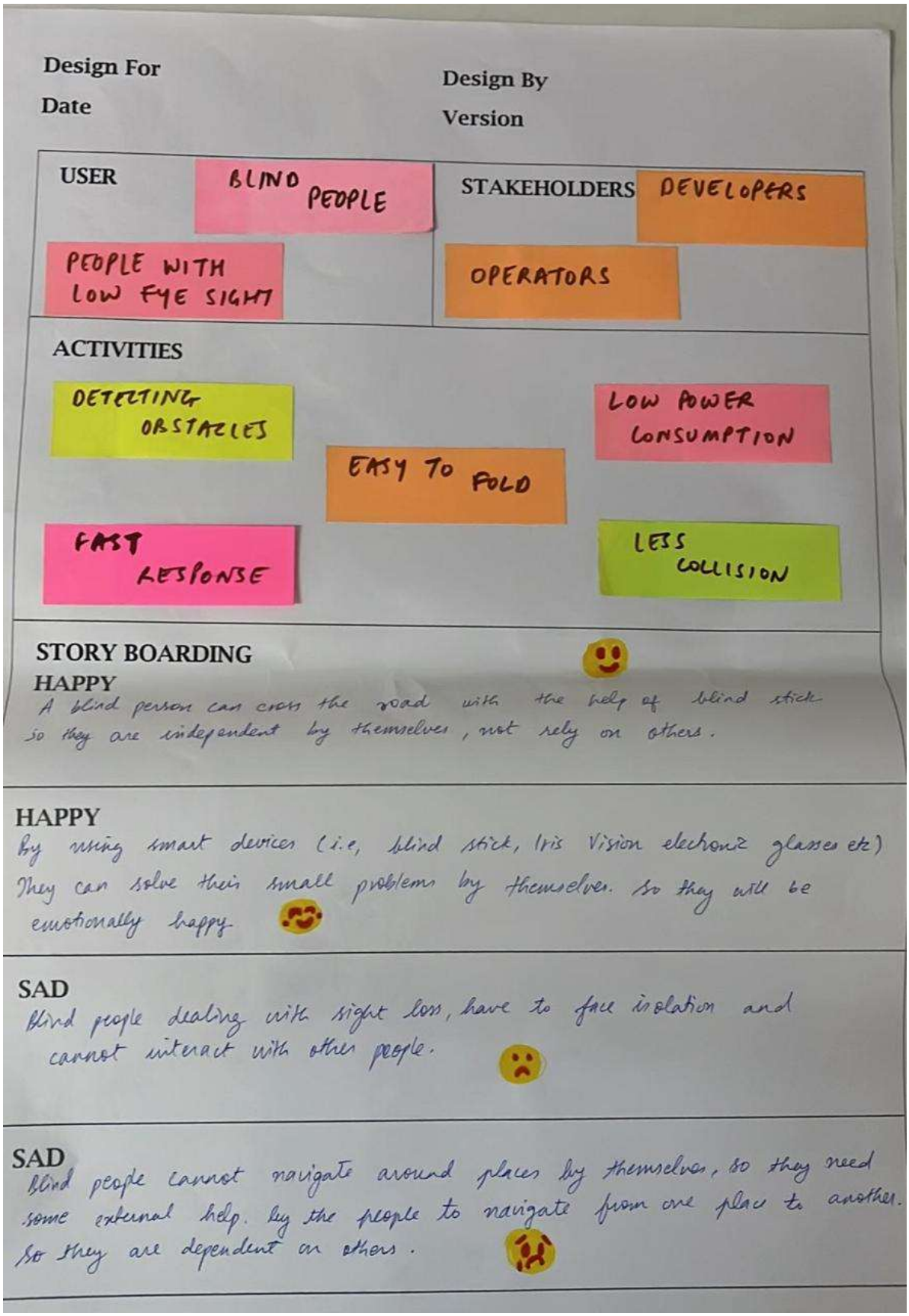
INTERACTIONS:

- DIRECTIONS ASSISTANCE WITH SOUND
- OBSTACLES DETECTION SENSORS WITH ENVIRONMENT
- HIDDEN OBSTACLES SUCH AS DOWNWARDS STAIRS,HOLES WITH BLIND PEOPLE
- ULTRASONIC FREQUENCIES(500 MHz) FROM SENSORS
- SENSORY ASSISTING FEATURES OF SMART BLIND STICK .

USERS:

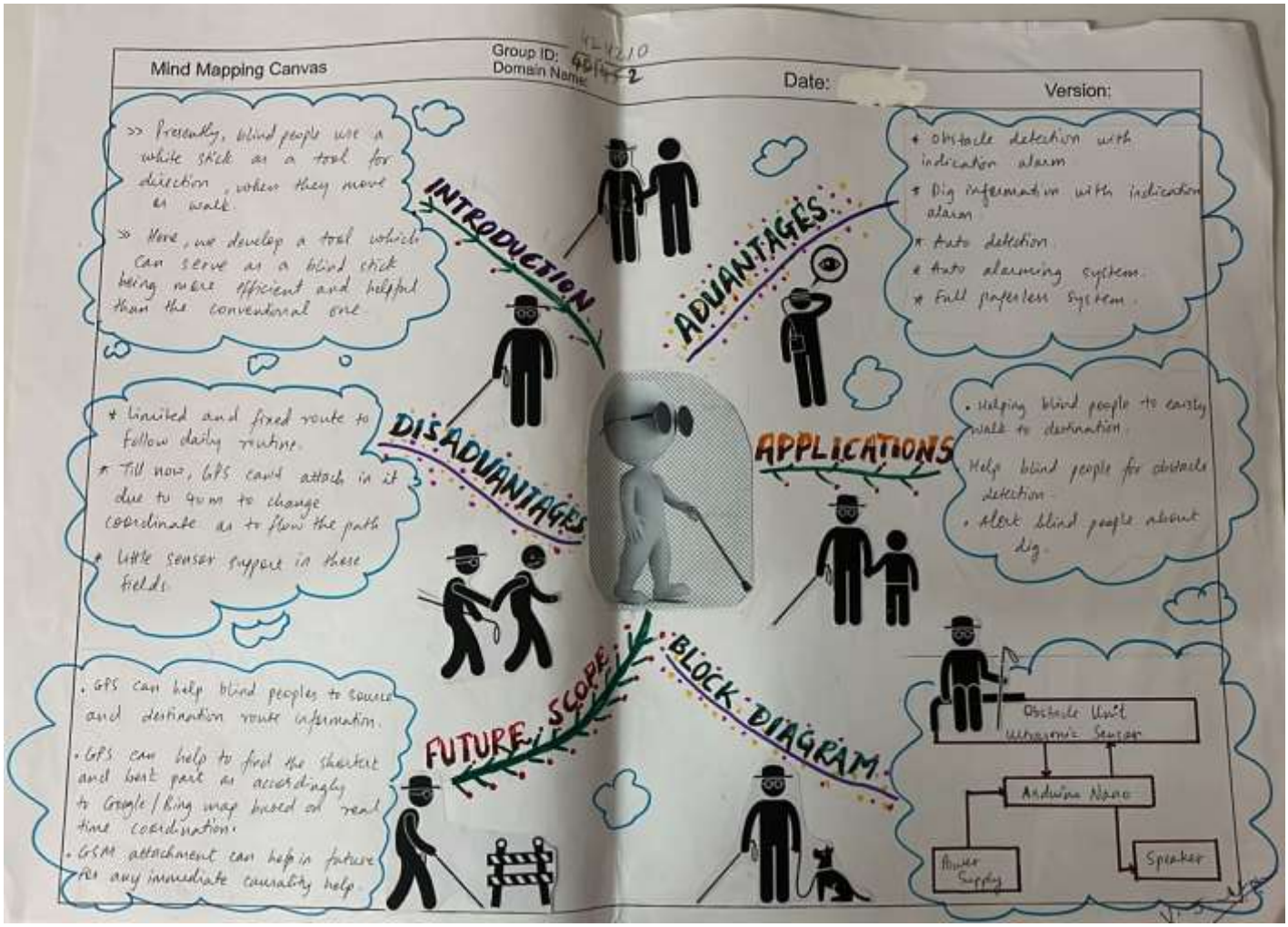
- VISUALLY IMPAIRED (BLIND PEOPLE)
- OLD PEOPLE WITH LOW EYE SIGHT
- PEOPLE OF ANY GROUP AGE (WITH LOW EYE SIGHT)
- ENGINEERS

Empathy Mapping:-

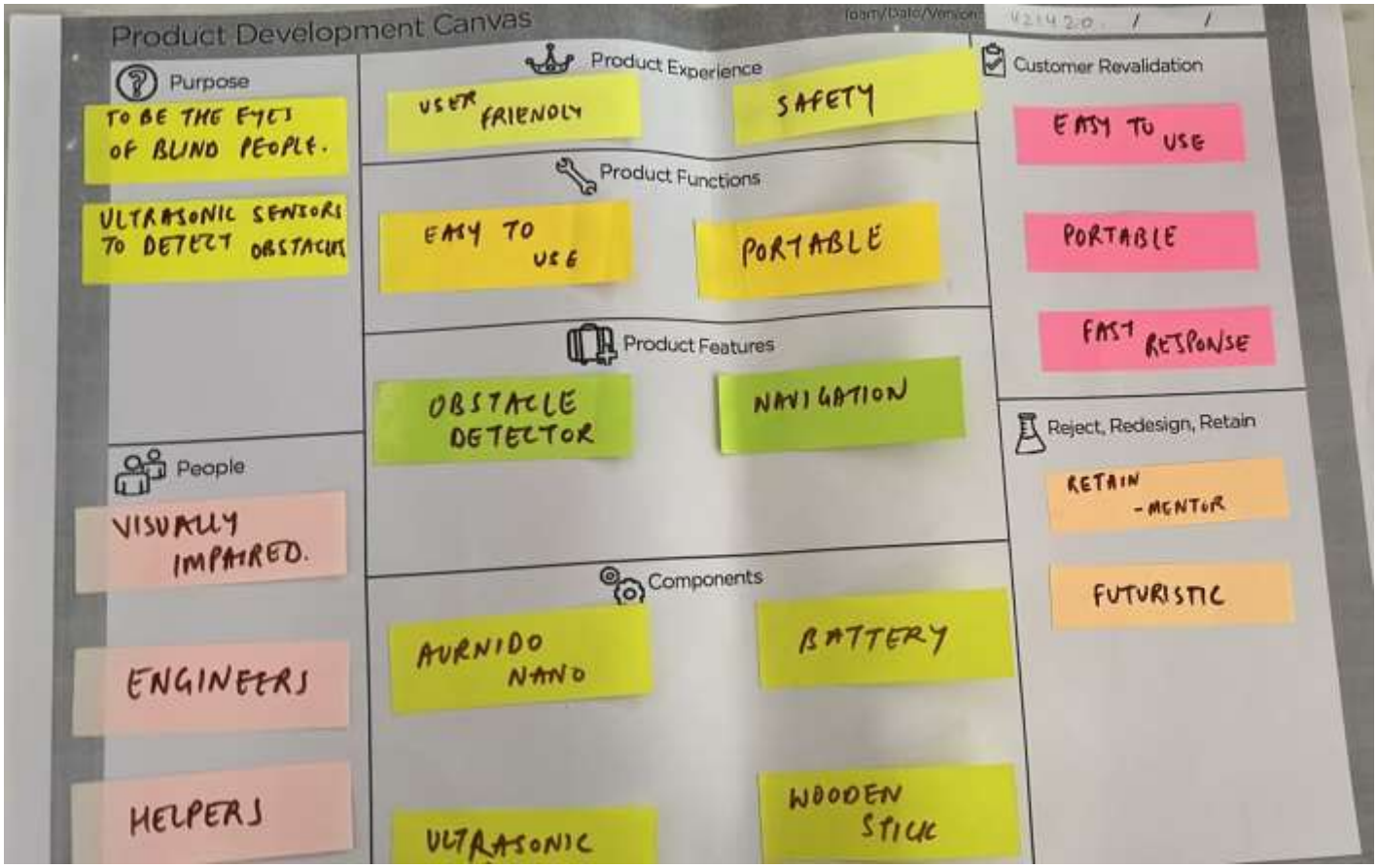


Ideation Canvas :

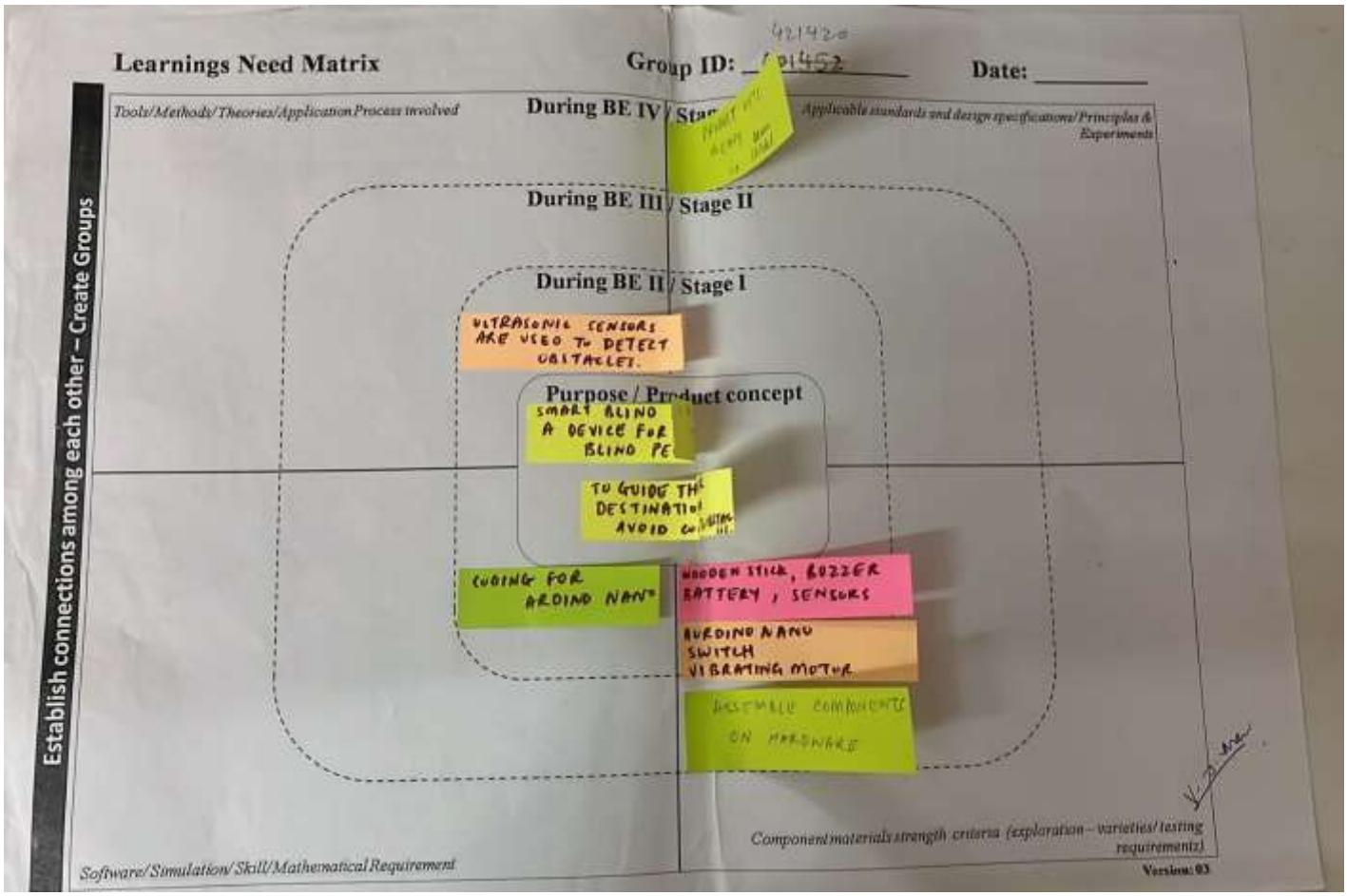
Mind Mapping:-



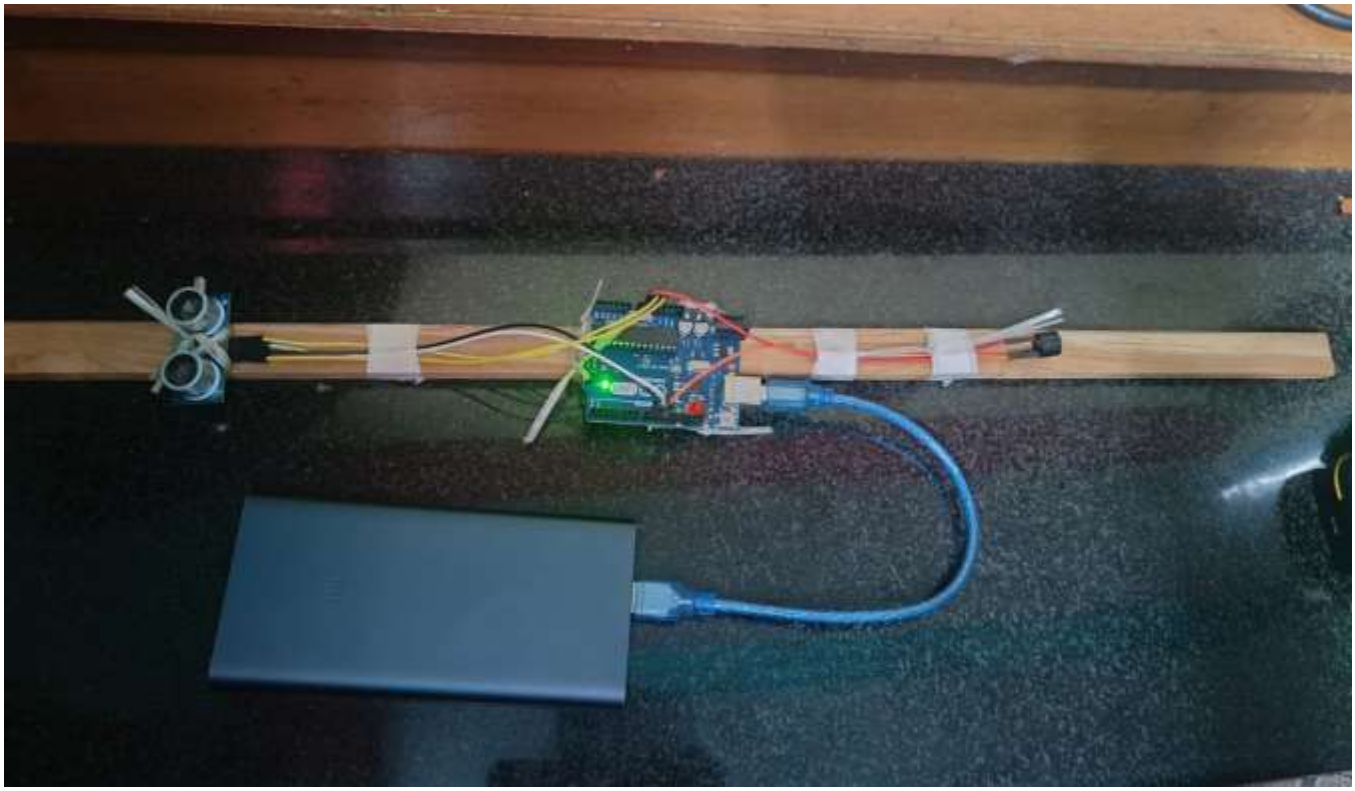
Product Development Canvas :

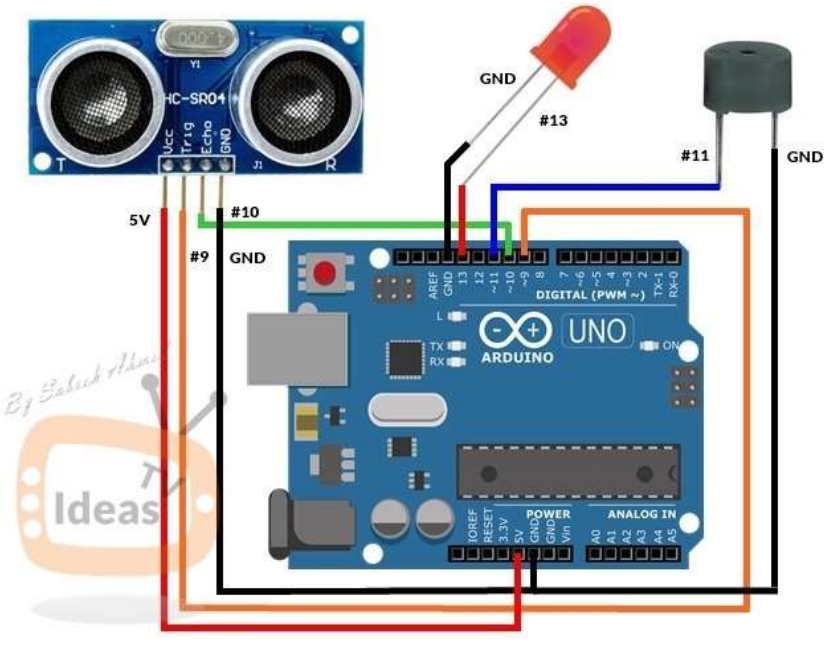


Learning Need Matrix:-



Prototype:




HC-SR04
Vcc
Trig
Echo
GND
GND
#13
#11
GND
5V
#10
#9
GND
DIGITAL (PWM ~)
UNO
ARDUINO
POWER
ANALOG IN

Conclusion :-

Humans are not disabled. A person can never be broken. Our built environment, ourtechnologies, is broken and disabled. We the people need not accept our limitations,but can transfer disability through technological innovation.

This system offers a low-cost, reliable, portable, low-power consumption and robust solution for navigation with obvious short response time. Though the system is hard-wired with sensors and other components, it's light in weight. Further aspects of this system can be improved via wireless connectivity between the system components, thus, increasing the range of the ultrasonic sensor and implementing a technology for determining the speed of approaching obstacles. While developing suchan empowering solution, visually impaired and blind people in all developing countrieswere on top of our priorities.

Summary :

After going through different stages of design engineering, wehave learnt lot of things which has helped us in making our project in a very innovative and user-friendly manner. Through the process of empathy mapping, mind mapping, ideation and product development canvases, we have learnt about users' needs and their problems. We also brainstormed about the various possible solutions that can be included. Finally, we interpreted our ideas through the design of thefinal prototype. From this suspect we understand this aspect and realisation of this scenario, how it will work and improvisation about the thing.