

SMART STICK FOR VISUALLY IMPAIRED

A project report submitted for Lean Start-up Management[TE2]

Bachelor of Technology

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1. INTRODUCTION, OBJECTIVE AND LITERATURE REVIEW

1.1. INTRODUCTION

Visual impairment is a condition of coming up short on the visual observation because of physiological or neurological elements. The halfway visual deficiency speaks to the absence of combination in the development of the optic nerve or visual focal point of the eye and all out visual impairment is the full nonattendance of the visual light discernment. All out visual deficiency is the finished absence of structure and visual light recognition and is clinically recorded as NLP, a truncation as "no light observation".

Larger part of them are utilizing a regular white stick to help in route. The restriction in white stick is that the data is picked up by contacting the articles by the tip of the stick.

The framework has been created utilizing both the equipment and programming usage.

The Hardware Part is utilized to identify the separation, water and snag between the article and the individual and differ the ringer sound as indicated by the separation among them and furthermore to send message if there should be an occurrence of any crisis.

1.2. OBJECTIVE:

The essential goal of this task is more secure and helpful methods for portability for the outwardly disabled without need of consistent help from their gatekeepers.

The primary fragment is sensor based and is utilized to recognize water puddles, approaching traffic or obstructions and raised highlights.

The subsequent fragment depends on area following, which sends a SMS having a google maps connect, which when clicked shows the area of the outwardly debilitated individual to the gatekeeper at equivalent interims of time. A catch is

likewise introduced which gives sends a SOS sign to the watchman, who utilizing the data gave by the GPS module, can find the outwardly debilitated individual.

1.3. MISSION:

Our Smart stick's mission is to provide customers with the finest specifications in smart stick units. We exist to attract and maintain customers. When we adhere to this maxim, everything else will fall in to place. Our services will exceed the expectations of our customers.

1.4. PRODUCT:

This product consists of two segments:

1.The hardware segment

2.The software segment

The hardware segment is sensor based and is used to detect obstacles.

The software segment The second segment is based on location tracking, which sends a SMS having a google maps link.

1.5. LITERATURE SURVEY:

1) BASE PAPER:

Swain KB et al. [1] The stick guide used a variety of sensors like Water level sensor, Ultrasonic sensors to endow the visually impaired person with auxiliary senses which sensed the obstacles within the proximity of the visually impaired person. The visually impaired person is made aware through vibrator motor. A push button sends out SOS using co-ordinates obtained from GPS and GSM Module.

2) SIDE - REFERENCES:

Mohommad Hazzaz et al. [2] have used microcontroller incorporated with ping sensor, proximity sensor, wet detector, a micro pager motor and additional equipment

Radhika R et al. [3] have used infrared, ultrasonic and water sensor. Obstacle detection within the distance of about 3m can be detected with the help of these sensors

K.S. Manikanta et al. [4] have used ultrasonic sensor along with light and water sensing. one more feature is that it allows the visually challenged to detect if there is light or darkness in the room.

Dr. Basawarai Gadgov et al. [5] have used global positioning system(GPS) and Global system for mobile communication (GSM) modules along with sensor like ultrasonic and infrared sensor .

2.PRODUCT

2.1. PRODUCT DESCRIPTION:

An Arduino based mechanized stick guide was made that fuses ultrasonic sensors,GSM module and GPS module.

Aside from the previously mentioned sensors and their related modules, a camera module, a microSD card peruse module and a 0.5W, 8 ω earphone speaker, which can be worn on the ear, is likewise consolidated to convey ready messages to shield the outwardly disabled individual from entering hazardous zones.

The assistive stick likewise has the component to send a SMS and an email to the outwardly weakened individual's guardian(s) in instances of crisis. This is actualized utilizing a GPS and a GSM module to send SMS. The SMS contain a web connect to Google maps, a web mapping administration that offers satellite symbolism and gives highlights like course arranging, that when given the longitude and scope gives the area of the outwardly disabled individual.

GPS Module secures the longitude and scope data important to follow the outwardly tested individual's area.

A battery is utilized to control the arrangement.

2.2: SPECIALIZED DETAILS:

2.2.1 SOFTWARE COMPONENTS:

Python: An open source programming language that is adaptable and profoundly hearty. Moreover, it is good with the Raspberry pi.

C++: A centre level language which is regularly utilized couple with equipment correspondence or perusing and keeping in touch with equipment. This language is perfect with Arduino.

2.2.2: HARDWARE COMPONENTS:

ARDUINO: a solitary board microcontroller which enables one to peruse simple information gave by the sensors and control other equipment modules.

A single board microcontroller which allows one to read analog data provided by the sensors and control other hardware modules.

Open-source electronic prototyping platform enabling users to create interactive electronic objects.

ULTRASONIC SENSOR: an acoustic transmitter-recipient pair which transmits ultrasonic waves and has a more drawn out range than an IR sensor. This sensor is associated in the mid area of the to recognize deterrents.

Ultrasonic sensors work by emitting sound waves at a frequency too high for humans to hear. They then wait for the sound to be reflected back, calculating distance based on the time required. This is similar to how radar measures the time it takes a radio wave to return after hitting an object.

GPS-GSM MODULE SIM808: This module uses a SIM card and its services to send the information to a guardian SIM808 module is a GSM and GPS two-in-

one function module. It is based on the latest GSM/GPS module SIM808 from SIMCOM, supports GSM/GPRS Quad-Band network and combines GPS technology for satellite navigation.

BUZZER: A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke an acoustic que for the outwardly tested individual, that conveys hints of various frequencies relying upon the sensor activating it. It is put on the highest point of the stick.

MINI BREADBOARD: The modern breadboard is a plug-and-play way to make connections between electronic components. It gets its name from the long-dead practice of using a wooden board (an actual bread-board if it was handy) to prototype circuits.

2.3: SALES LITERATURE:

Essential wellspring of offers composing will be through our business executives who will visit the corporates autonomously. All information identifying with the association will be given to our customers through handouts and direct mailing. It will outfit the customer with point by point information about the different packs open. Later on as the association creates, we will doubtlessly advance in development and auto magazines, papers, etc. Certifiable bargains not done.

2.4: ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

- *Accurate detection of obstacles of left, right and front side.*
- *Very confident for the users independency and confidence.*
- *Detection of ground level to head level.*
- *Low cost.*
- *Very lower power consumption.*
- *High performance.*
- *Auto detection and auto alarming.*

Disadvantages:

- *Recognition of objects.*
- *Not water proof.*

3. BUSINESS:

3.1: BUSINESS MODEL:

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
1. Investors (Start up India),(Loanee) 2. Retailers 3. Employees with good equity and who can produce good results to our product	1. Marketing more on the basis of the quality of our product 2. Increase the quality keeping the competitors in the mind and collect feed back from the people to develop further.	1. Make product cost effective 2. Increased Quality 3. Provide Guide which is in the languages According to the surroundings	1. Get to know all the queries of the customers by some means. 2. Reviewing once in a month on the growth of customers and make the product available in their locality 3. Give Some offers on the product so that There might be the chance of increase in number of customers	1. House hold users who are avid with little technology. 2. Customers and organisations who are in need of Our product
	Key resources			Early Adopters
Services	1. Skilled Labour 2. Equipment for making the product	4. No complexity in the product so that this may add some value to our product	Channels	1. Customers who show interest towards portable water purifiers 2. Some the Start up water filter Agencies
Provide sustainable water purification product which is provided by third party agents through online(Amazon)			1. Advertisement in social media 2. Publicity through newspaper 3. Word of mouth	
Cost Structure		Revenue Streams		
1. Equipment needed to make the product for example: Turkey baster, Coffee filters, Activated carbon 2. Skilled Labour		1. Payment for advertisement 2. Customer membership fee (In order to get more offers on our product) 3. Advance amount paid by customers for testability of the product 4. All the payment options available According to their delivery location		

3.2: BUSINESS PLAN TIMELINE:

3.2.1: TASKS:

Task 1: Analysing The Existing Model.

We analysed existing models of different smart sticks. We done a research on knowing how to sustain in the market in loss and also found out how to get into market. We browsed core advantages and disadvantages of smart sticks. We gathered what are the legal permissions required for releasing our product, we searched for copyrights taken by the existing filters.

Task 2: Gathering up the ideas.

Based on the information collected by each individual in our group we discussed what new features can be implemented in the system. It took more time for gathering ideas as we discussed weather that works in practical or not. After listing all the ideas, we once again checked weather these types of ideas

are implemented in existing systems or not. Finally, we grouped the main ideas that suits with our product.

Task 3: Doing Economic Research in the Domain and Survey

We did Economic research in the Domain of the existing smart sticks. We found the cost they spend on raw materials every year and what are their profits, loss, also what is their success rate in the market. How public reacts to the prices of the product (we conducted a small survey in finding it).

Task 4: Gathering Up permissions

As we analysed the existing models then we also note what are the permissions they took for their product. We found out some permissions in common from different products and analysed which suits our project after this we browsed for any new permissions and also took our faculty's help in finding the permissions that to be taken for our product.

Task 5: Investments (Getting from 3rd party) and completing the formalities.

We developed a prototype by our own investment then for main product we need to tie-up with some companies by explaining and showing our product, how it is different from others and how could it be survived in the market. We also get the help from the government, as it cancelled tax for the start-ups who has more profit.

Task 6: Gathering up the Raw products.

We ordered stick, GPS and GSM module from online. It took almost 10 days for these arrival. Then we got cardboard and wires from the nearby store. We also ordered ultrasonic sensor from amazon which helps to identify the obstacles in front of the person. We added the buzzer for alarm.

Task 7: Doing research and theoretical implementations.

We done research how to prepare a prototype. then fixed how to do the implementation. We done research weather this meets our ideas or not and prepared a document for implementing the main product theoretically.

Task 8: Developing a Prototype and Testing the prototype

Filter preparing the prototype using the gathered raw materials; we tested in several ways this prototype gives the expected result or not. It took more than a 2 days to test the prototype.

Task 9: Consulting an Advertiser and publish the information.

We consulted the faculty to know whether he is satisfied with the prototype are not.

Task 10: Deploy the Product.

We are thinking to introduce our product in the market for a confined area and later spread our product.

3.2.2: MILESTONES:

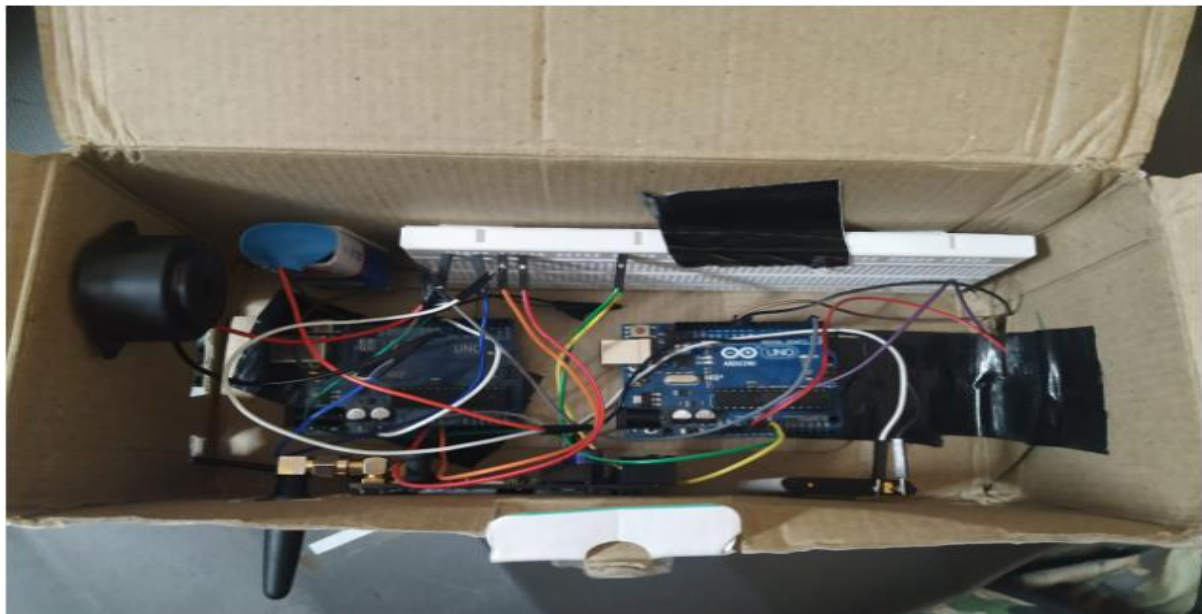
Milestone 1: To start the product analysis.

Milestone 2: To get an idea about what product and how we are going to design it.

Milestone 3: Make the Product and do all the testing stuff.

Milestone 4: To deploy the product in the actual market.

4.IMPLEMENTATION



Ultrasonic sensor



Circuit:





Final prototype

5.RESULT AND DISCUSSION:

5.1: PROJECT RESULT:



3 cm - 10 cm

the ultrasonic sensor is detecting the obstacle for the range 3cm-10cm and produce the sound with very high intensity as signal to visually challenged person



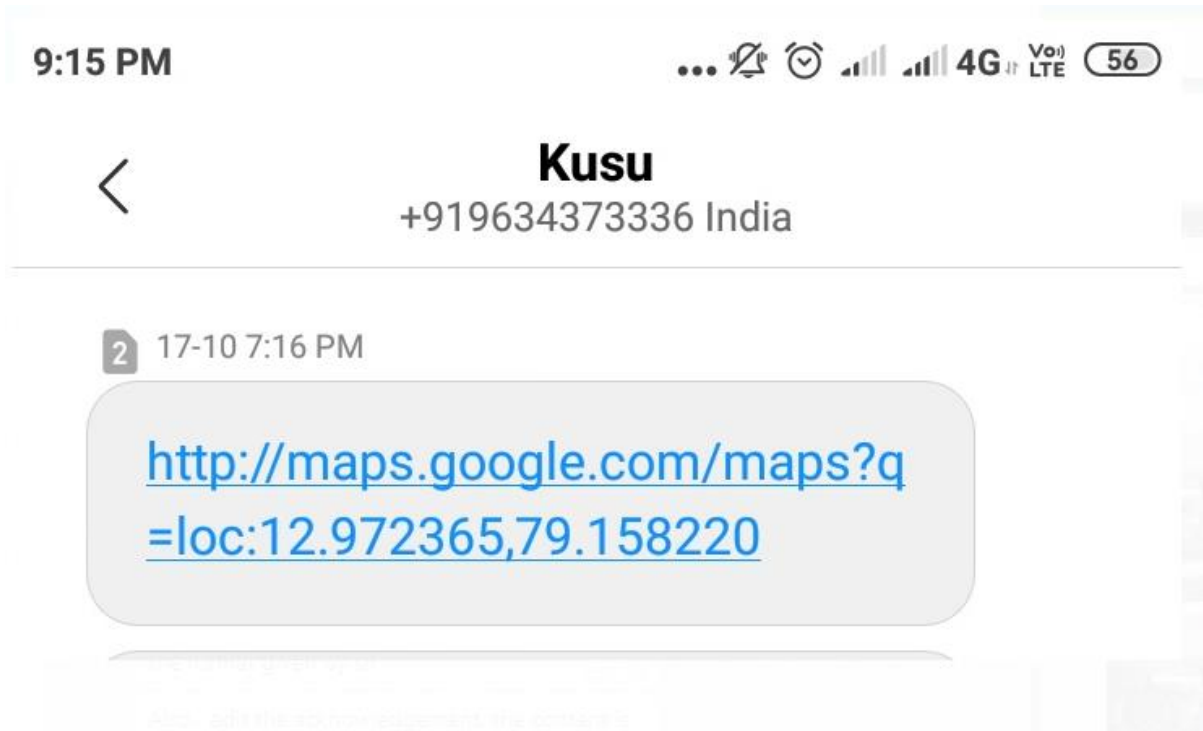
10 cm - 20 cm

the ultrasonic sensor is detecting the obstacle for the range 10cm20cm and produce the sound with lower intensity as signal to visually challenged person.

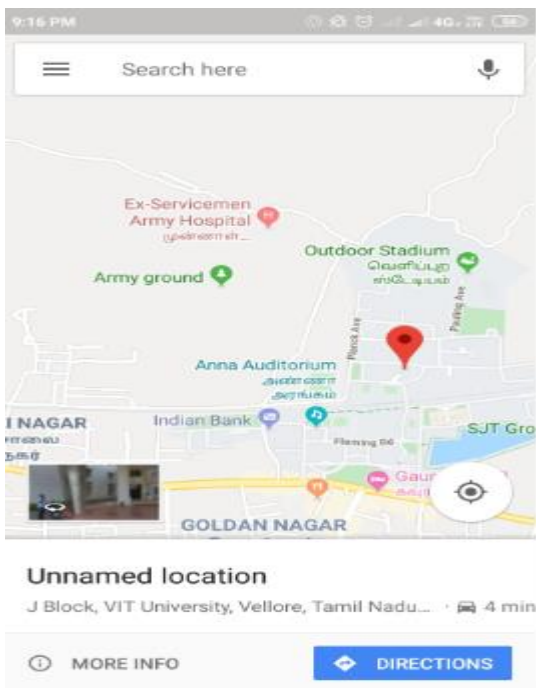


20CM-50CM

the ultrasonic sensor is detecting the obstacle for the range 20cm-50cm and produce the sound with moderate intensity as signal to visually challenged person.



Link sends query to Google maps which contains the location of the visually challenged person.



Location seen by the guardian

6: CONCLUSION

- *The designed smart stick working efficiently. It can help the visual impaired person appreciably in guiding in their way. As it has GSM module, so an impaired person can use it at the time of emergency and will be able to send an emergency SMS to the helpline chosen by him.*
- *The model can be further improved by employing the CAMERA module with the existing hardware, which also work at the time of emergency.*

5.1. SUCCESS RATE:

The product that we have made is of advantages and disadvantages so we cannot say that It is completely successful because even though we have many advantages over them but the standards and the name stands a bit lower when compared to other companies ,since this is a starting we have some legal implications should be taken and better employees who work for our product .Mainly our prototype is of 60% success and 40% failure that means it is not up to the standards when compared to other companies as they have well equipped infrastructure Since we have used turkey baster as the main component that holds the water level ,it is quite delicate that breaks. The result which we got is not a bad one but must be more better, even though the use of activated arduino in the circuit plays a major role but the portable smart sticks which the other companies are trying to make the bigger prototype by making the size of the main component the cause of 40% failure is that for every three months batteries must be changed.so the costing will be more and investment will be more as we need to provide the sensors and Arduino with the prototype. If it is taken over all the product is up to remark. When terms of sales “actual sales” are not done.

5.3: FUTURE SCOPE:

It can be further enhanced by using VLSI technology to design the PCB unit. This makes the system furthermore compace. Also, use of active RIFD tags will transmit the location information automatically to the PCB unit, when the smart stick is in its range. The RFID sensor doesn't have to read it explicitly.

The global position of the user is obtained using the global positioning system (GPS), and their current position and guidance of their destination will be given to the user by voice.

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