INTRODUCTION TO INNOVATION AND ENTREPRENUERSHIP

# INTELLIGENT MOBILITY CANE

SMART BLIND STICK

PRESENTED BY

TEAM VISION

NOTE:
Presentation done by every one.

| TEAM | CONTRIBUTION |
| --- | --- |
| JSR SUJIT | Buisness plan |
| Rishikesh reddy | Profit model |
| Shikhara | SWOT and COST analysis |
| Sashank rathod | Working and Problem statement |
| Bhavya charitha | Competitive analysis |

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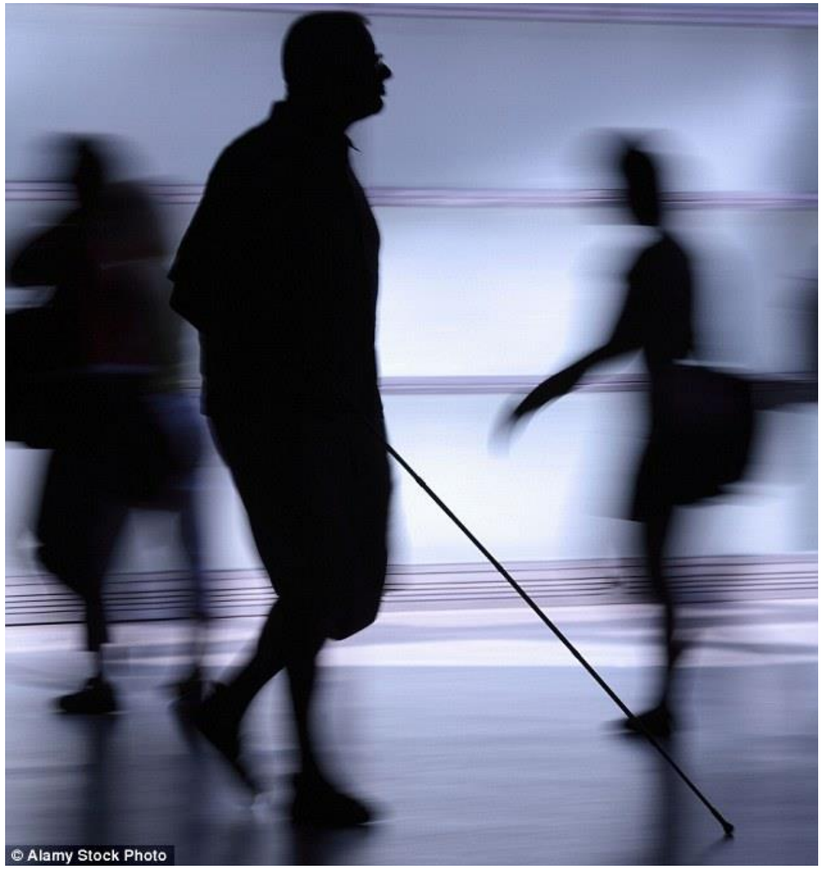
# PROBLEM STATEMENT

- For individuals with limited mobility, navigating their environment can be a challenge. Individuals with limited mobility may have difficulty performing tasks that require fine motor skills, such as manipulating buttons or operating touchscreens.
- The mobility stick with AI and IoT capabilities will provide real-time feedback and assistance to users with limited mobility. This will improve their ability to navigate their environment and perform tasks that require fine motor skills



# EXISTING SOLUTIONS

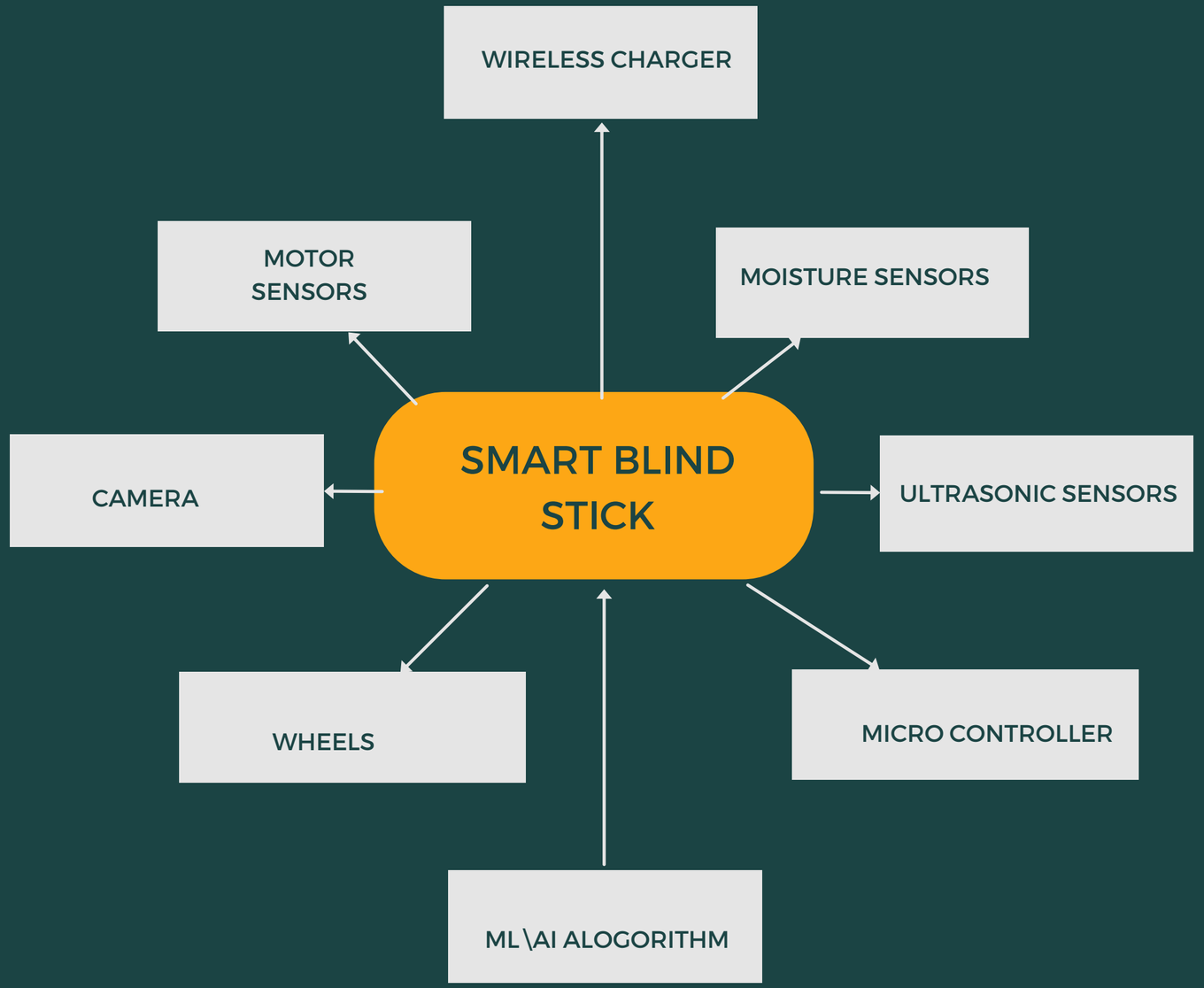
- WeWalk smart cane
- Horus
- Sunu band
- Blind shell

# PROPOSED SOLUTION

To address these issues, we propose the development of a mobility stick with AI and IoT capabilities. This mobility stick will be equipped with sensors that can detect changes in terrain and provide real-time feedback to the user.

- Real time navigation
- Smart home integration
- Fall detection
- Multilingual support
- Object recognition
- wheels and Moisture sensor

# COMPONENTS OF THE PRODUCT



# AI ALGORITHM

```
import numpy as np
import cv2
import time
import pygame
import os
import requests
import json
import RPi.GPIO as GPIO

# Load the pre-trained Haar Cascade classifier for detecting faces
face_cascade = cv2.CascadeClassifier('haarcascade_frontalface_default.xml')

# Load the pre-trained model for object detection
yolo_net = cv2.dnn.readNet("yolov3.weights", "yolov3.cfg")
classes = []
with open("coco.names", "r") as f:
classes = [line.strip() for line in f.readlines()]
layer_names = yolo_net.getLayerNames()
output_layers = [layer_names[i[0] - 1] for i in yolo_net.getUnconnectedOutLayers()]

# Load the camera and set its parameters
cap = cv2.VideoCapture(0)
cap.set(3, 640)
cap.set(4, 480)
cap.set(10, 100)
```

```
# Initialize the moisture sensor
moisture_sensor = MoistureSensor()

# Initialize the motor for wheels
wheels = Wheels()

# Initialize the wireless charger
wireless_charger = WirelessCharger()

# Initialize the text-to-speech module for multilingual support
tts = TextToSpeech()
# Initialize the ultrasonic sensors GPIO_TRIGGER = 18 GPIO_ECHO = 24 GPIO.setmode(GPIO.BCM)
GPIO.setup(GPIO_TRIGGER, GPIO.OUT)
GPIO.setup(GPIO_ECHO, GPIO.IN)

# Define a function to detect objects in the camera feed
def detect_objects(img):
height, width, channels = img.shape

# Convert the image to a blob and pass it through the YOLO network
blob = cv2.dnn.blobFromImage(img, 0.00392, (416, 416), (0, 0, 0), True, crop=False)
yolo_net.setInput(blob)
outputs = yolo_net.forward(output_layers)
```

```
# Process the output of the YOLO network and draw bounding boxes around detected objects
class_ids = []
confidences = []
boxes = []
for output in outputs:
for detection in output:
scores = detection[5:]
class_id = np.argmax(scores)
confidence = scores[class_id]
if confidence > 0.5:
center_x = int(detection[0] * width)
center_y = int(detection[1] * height)
w = int(detection[2] * width)
h = int(detection[3] * height)
x = int(center_x - w / 2)
y = int(center_y - h / 2)
boxes.append([x, y, w, h])
confidences.append(float(confidence))
class_ids.append(class_id)
indexes = cv2.dnn.NMSBoxes(boxes, confidences, 0.5, 0.4)
```

```
# Loop over the detected objects and draw bounding boxes around them
for i in range(len(boxes)):
if i in indexes:
x, y, w, h = boxes[i]
label = str(classes[class_ids[i]])
cv2.rectangle(img, (x, y), (x + w, y + h), (0, 255, 0), 2)
cv2.putText(img, label, (x, y + 30), cv2.FONT_HERSHEY_PLAIN, 2, (0, 255, 0), 2)
return img

# Define a function to detect faces in the camera feed
def detect_faces(img):
gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
faces = face_cascade.detectMultiScale(gray, 1.3, 5)
for (x,y,w,h) in faces:
# Draw a rectangle around the detected face
cv2.rectangle(img,(x,y),(x+w,y+h),(255,0,0),2)
# Add haptic feedback to the motor for wheels to indicate the direction of the detected face
if x < 220:
wheels.move_left()
elif x > 420:
wheels.move_right()
else:
wheels.stop()
# Check the moisture level using the moisture sensor and provide voice feedback if it's too high or too low
moisture_level = moisture_sensor.get_moisture_level()
if moisture_level > 800:
tts.speak("The ground is too wet, be careful!")
elif moisture_level < 400:
tts.speak("The ground is too dry, be careful!")
return img
```


# SWOT ANALYSIS

By conducting a thorough SWOT analysis, we can better understand the strengths, weaknesses, opportunities, and threats associated with the Smart Blind Stick. This knowledge will be invaluable as we work to develop and refine this innovative product.

# Strengths

- Use of advanced technology
- Sensors and cameras that can detect obstacles and provide real-time feedback to the user
- Versatility
- Useful for a wide range of individuals with varying degrees of visual impairment

# Weakness

- High cost.
- Regular maintenance and updates
- Reliance on technology

# Opportunity

- Potential for integration with other devices
- Potential for customization.
- Potential for starting Market on rented services of our product

# THREATS

- Competition from other products
- Regulatory hurdles


# COST ANALYSIS

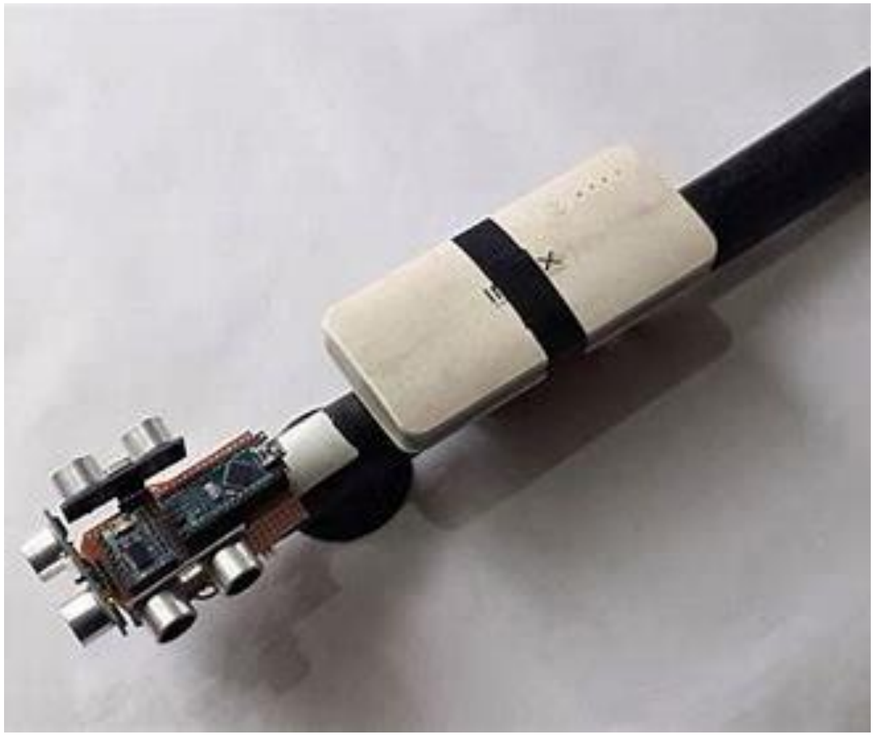
**DESIGN AND DEVELOPMENT COST**

**MANUFACTURING COSTS**

**MARKETING AND DISTRIBUTION COSTS**

# DESIGN AND DEVELOPMENT COST

- Requires extensive research and development.
- Cost of hiring engineers, designers, and other experts to develop the technology.
- Cost of materials used in the construction - High-quality sensors, batteries, and other components.



# MANUFACTURING COSTS

- Assembling the various components of the device into a functional unit.
- Cost of specialized machinery and skilled labor.
- Cost of quality control measures, such as testing and inspection.

# MARKETING AND DISTRIBUTION COSTS

- Advertising and promotion to create awareness of the product and generate demand among potential customers.
- Distribution costs, such as shipping and handling.
- Cost of transporting the device from the manufacturing facility to retail outlets

# APPROXIMATE COST

(PER UNIT)

| COMPONENT | COST | COMPONENT | COST |
|---|---|---|---|
| RASPBERRY PI 4 MODEL | $35-$55 | MOTOR AND WHEELS | $15-$25 |
| PI CAMERA MODULE | $25-$30 | POWER BANK | $20-$50 |
| MOISTURE SENSOR | $5-$10 | WIRELESS CHARGER | $10-$20 |
| ULTRASONIC SENSOR | $2-$5 | EARPHONE WITH MICROPHONE | $5-$20 |

# COMPETITIVE ANALYSIS

MARKET OVERVIEW

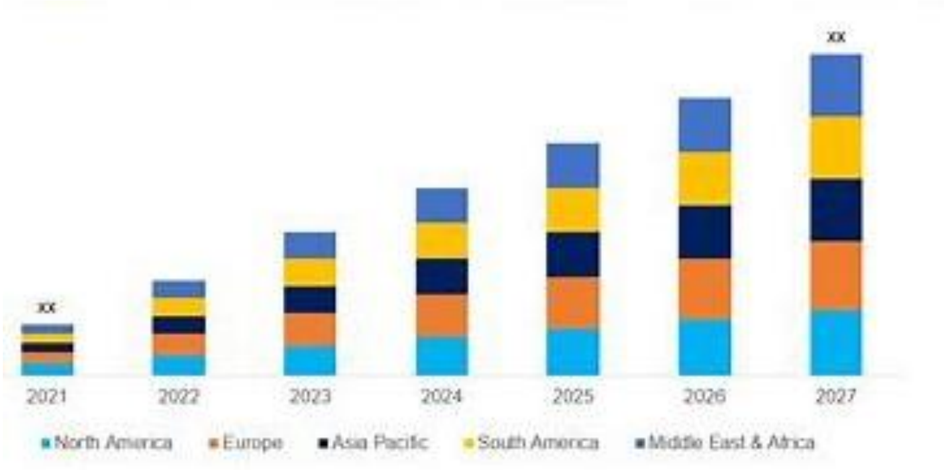
COMPETITIVE LANDSCAPE


PRODUCT COMPARISON

MARKETING STRATEGY

# MARKET OVERVIEW

- The market for assistive technology devices has been growing rapidly over the past few years.
- According to a report by Grand View Research, the global assistive technology market size was valued at USD 22.6 billion in 2019 and is expected to grow at a CAGR of 7.9% from 2020 to 2027.



# COMPETITIVE LANDSCAPE

- There are several competitors in the market offering similar products to the smart blind stick.
- Some of the major players in the market include Sunu, WeWALK, and OrCam Technologies.

# PRODUCT COMPARISION

- When comparing the smart blind stick to its competitors, it offers several unique features.
- For example, the smart blind stick comes equipped with obstacle detection sensors and GPS navigation, which sets it apart from other similar products in the market.

# MARKETING STRATEGY

- Target the right audience.
- This includes visually impaired individuals, their family members, and organizations that support visually impaired individuals.

# PROFIT MODEL

PRODUCT SALES

SUBSCRIPTION MODEL

DATA MONETIZATION

PARTNERSHIPS

# PRODUCT SALES

- As the device gains popularity, there will be a significant demand.
- Leverage various marketing channels such as social media, online marketplaces, and partnerships with organizations that serve the visually impaired community.

# SUBSCRIPTION MODEL

- Paying a monthly or annual fee to access its features and functionalities.
- For users who may not want to make a large upfront investment in the device, but still want to benefit from its capabilities.

# DATA MONETIZATION

- Data about its users' movements and interactions with their environment.
- This data can be monetized by selling it to third-party companies.
- Important to ensure that user privacy is protected and that data is anonymized before being shared with external parties.

# PARTNERSHIPS

- Partnering with other companies and organizations. For example, buses and trains.
- Smart home systems, allowing users to seamlessly navigate their homes and control various devices using voice commands.

# BUSINESS PLAN

MARKET RESEARCH

PRODUCT DEVELOPMENT

MARKETING STRATEGIES

FINANCIAL PROJECTIONS

# MARKET RESEARCH

- Conducted extensive market research to identify the needs and preferences of visually impaired individuals.
- Many existing devices were either too expensive or not effective enough.
- Significant demand for affordable and reliable assistive technologies.

# PRODUCT DEVELOPMENT

- Advanced technologies such as ultrasonic sensors and artificial intelligence.
- Prioritize accessibility and affordability throughout the development process.
- The Smart Blind Stick is lightweight, portable, and easy to use.

# MARKETING STRATEGIES

- Social media advertising, influencer partnerships, and community outreach programs.
- Work with organizations that support visually impaired individuals to raise awareness about our product and provide resources for those who may benefit from it.
- Building a strong brand and creating a loyal customer base

# FINANCIAL PROJECTIONS

- We estimate that the Smart Blind Stick will have a profit margin of approximately 30%.
- Reinvest a portion of our profits into research and development to continue improving the Smart Blind Stick and expanding our product line.

# RESOURCES


- https://circuitdigest.com/microcontroller-projects/voice-alert-based-smart-blind-stick-using-arduino-and-ultrasonic-sensor
- https://techcrunch.com/2022/12/08/wewalk-raises-cash-to-bring-computer-vision-to-smart-cane-for-visually-impaired-people/

# THANK YOU