PROJECT REPORT

ON

"SMART BLIND STICK"

THIS PROJECT & RESEARCH REPORT HAS BEEN INDEPENDENTLY DEVELOPED BY ME AND IS NOT SUBMITTED TO ANY COLLEGE OR UNIVERSITY FOR ACADEMIC EVALUATION

Developed by

Name:-Suzen Kumar Mohanty (**Reg.No**.2421331063)

SKMP PROJECT MANAGEMENT

SKMP PROJECT MANAGEMENT

DEPARTMENT OF IOT

POLISHLINE.BALASORE, ODISHA, INDIA

MAY -2026

“Dedicated to my beloved parents ,and teachers who have worked hard throughout my education”

SKMP PROJECT MANAGEMENT

CERTIFICATE

*This is to certify that the project entitled "**SMART BLIND STICK**"*

Has been independently developed and completed by Suzen Kumar Mohanty for the purpose of enhancing technical knowledge, skills, and practical understanding.

This project is a self-initiated work carried out with person al interestand research. It has not been submitted to any college, university, or institution for the award of any degree or diploma.

The work presented in this project is genuine and has been completed by the developer himself.



Suzen Kumar Mohanty

(Project Developer)

Date: 26 / 05 / 2026

Place:-Balasore,Odisha,India

SELF ATTESTATION

I here by declare that I have personally worked on the project entitled "**SMART BLIND STICK**"All the data, analysis, and implementation presented in this project are the result of my own efforts and genuine work .Any external sources of information, if used, have been properly acknowledged.

This project is created solely for learning , skill development ,and professional improvement, and has not been submitted to any institution for academic purposes.



Suzen Kumar Mohanty

(Project Developer)

Date: **26 / 05 / 2026**

Place:Balasore,Odisha,India

SKMP PROJECT MANAGEMENT

DECLARATION

I hereby declare that the project titled "**SMART BLIND STICK**"**i**s an original work carried out by me based on my own idea, research, and implementation.

This project that has not been submitted previously ,in part or in full, to any college, university, or institution for the award of any degree, diploma, or certification.

I confirm that all the information presented in this project is true to the best of my knowledge. Any references or sources used have been properly acknowledged.

I take full responsibility for the authenticity and originality of this work.

SKMP PROJECT MANAGEMENT

Name: Mr. Suzen Kumar Mohanty

Branch: Computer Science And Engineering

Institution:[Srinix Collage Of Engineering ,Independent]

Date:[26 / 05 / 2026]

ACKNOWLEDGMENTS

I would like to express my sincere gratitude to everyone who contributed, directly or indirectly, to the development of this project, "**SMART BLIND STICK**."

This project is the result of my personal interest, dedication, continuous learning, and exploration of electronics, automation, sensor technology, and control systems.

I am thankful to the developers of Arduino, the creators of open-source hardware and software resources, and the technical communities whose documentation, tutorials, and knowledge-sharing platforms helped me understand and implement the concepts used in this project.

I would also like to acknowledge the importance of self-learning, practical experimentation, and problem-solving throughout the development process. These experiences helped me strengthen my technical knowledge and improve my understanding of real-world automation systems.

Finally, I am grateful to everyone who supports innovation, DIY engineering, and independent technical projects. This work reflects my enthusiasm for learning, creating, and exploring new possibilities in technology.

Developed By:

Suzen Kumar Mohanty

ABOUT MYSELF



I am Mr. Suzen Kumar Mohanty , a passionate and dedicated Web Developer and SOC Analyst (Level 1) from the field of Computer Science and Engineering, with strong expertise in HTML, CSS, JavaScript, and I specialize in building scalable, responsive, and high-performance web applications that deliver seamless user experiences across all devices and screen sizes.

With a keen eye for detail, I focus on writing clean, maintainable, and well-structured code. My development approach is centered around Creating intuitive user interfaces, ensuring both functionality and aesthetic quality. I follow modern front-end development practices such as component-based architecture, responsive design principles, and performance optimization techniques to build efficient and user-friendly applications.

Beyond web development, I actively work on IoT-based solutions, where I integrate hardware and software to create smart, real-world systems. I have hands-on experience with Arduino Uno and various sensors, enabling me to develop projects such as environmental monitoring systems, smart automation solutions, and real-time data tracking applications.

One of my key strengths lies in connecting IoT devices with web technologies. I build interactive dashboards that allow real-time data visualization, giving users the ability to monitor, analyze, and control devices remotely. My work focuses on bridging the gap between the physical and digital world by transforming raw sensor data into meaningful insights.

I am deeply interested in developing innovative, data-driven solutions that combine web technologies with embedded systems. My goal is to create impactful applications that solve real-world problems while improving efficiency, automation, and user experience.

With a strong passion for continuous learning and innovation, I consistently explore new tools, frameworks, and technologies to enhance my skills and deliver high-quality, future-ready solutions.

Name: Mr. Suzen Kumar Mohanty

Branch: Computer Science And Engineering

MyPortPolioLink:-https://suzen-kumar-mohanty-8fdv.vercel.app/

ABSTRACT

A smart stick concept is devised to provide a smart electronic aid for blind people . Blind and visually impaired find difficulties in detecting obstacles during walking in the street.The system is intended to provide artificial vision and object detection, real time assistance via making use of Arduino UNO.
The main objective of our project is to provide a sound based assistance to blind people.
The existing devices for the visually impaired only focus on travelling from one location to another.
The device is aimed to help visually impaired with the same maneuver as that of sighted people.
A brief study had been carried out to understand various issues related to the project which involves providing a smart electronic aid for blind people to provide artificial vision and object detection, real assistance via GPS module by using Arduino Uno.
Our project mainly focuses on the visually impaired people who cannot walk independently environment.
The system consists of ultrasonic sensors, and the feedback is receive through audio.
The aim of the overall system is to provide a low cost and efficient navigation and obstacle detection aid for blind which gives which gives a sense of artificial by providing information about the environmental scenario of static and dynamic object round them, so that they can walk independently.

SKMP PROJECT MANAGEMENT

LIST OF FIGURES

Figure No.	Figure Title	Page No.
01	ULTRASONIC SENSOR	12
02	ARDUINO UNO BOARD	12
03	BUZZER	13
04	BATTERY	14
05	LED LIGHT	14
06	BLOCK DIAGRAM	18
07	CIRCUIT DIAGRAM	18
08	SMART BLIND STICK DIAGRAM	19

SKMP PROJECT MANAGEMENT

INDEX

Chapter No.	Chapter Title	Page No.
Front Matter	Project Report	I
	Dedication	II
	Certificate	III
	Self Attestation	IV–V
	Declaration	VI
	Acknowledgments	VII
	About Myself	VIII
	Abstract	IX
	List of Figures	X
Chapter 1	Introduction	**8**
	1.1 Introduction	8
	1.2 Objectives	8
Chapter 2	Literature Review	**9**
	2.1 Literature Survey	9
Chapter 3	Proposed Model	**10**
	3.1 Theoretical Background	10
	3.2 Components Required	10
	3.2.1 Ultrasonic Sensor	11
	3.2.2 Arduino UNO	11
	3.2.3 Buzzer	12
	3.2.4 9V Battery	12
	3.2.5 LED	13
Chapter 4	Arduino UNO Code	**14**
Chapter 5	Methodology	**16**
	5.1 Working Principle	16
	5.2 Block Diagram	17
	5.3 Circuit Diagram	17
Chapter 6	Results and Discussions	**18**
	6.1 Results	18

SKMP PROJECT MANAGEMENT

Chapter 7	Applications	**19**
	7.1 Applications	19
Chapter 8	Project Links	**20**
	Website Link	20
	Google Drive Link	20
	Video Link	20
Chapter 9	Conclusions and Future Scope	**21**
	9.1 Conclusions	21
	9.2 Future Scope	21–22
	References	22–24
	End Page	25

SKMP PROJECT MANAGEMENT

Chapter 1

INTRODUCTION

➢ Smart Blind Stick Using Arduino

Eye sight plays a major role in collecting most of the information from the real world and that information will be processed by brain, visually impaired people suffer inconveniences in their daily life and social life. Blindness or visual impairment is condition that affects many
people around the world. This condition leads to the loss of the valuable senses of vision.Worldwide there are millions of people who are visually impaired , where many of them are blind. The need for assistive devices was and will be continuous. There is a wide range of navigation systems and tools existing for visually impaired individuals.The blind person truly requires an identifying objects.

➢ Objectives

The main objective of our project is to provide a sound based assistance to blind people. Here we are trying to develop a system that helps
blind person to travel independently and works efficiently. Current navigation
device for the visually impair focus on travelling from one location to another. Our project focuses on designing a device for blind people that help
them to travel independently and also it must be confortable to use. The proposed device is used for guiding individuals who are blind or partially

sighted. The device used to help blind people to move with the same ease and
confidence as a sighted people.

Chapter 2

LITERATURE REVIEW

➢ Literature Survey

A literature survey is a proof essay of sorts. It is a study of relevant literature materials in relation to a topic we have been given. For thorough development of the device Smart Stick for Blind using Arduino Uno, we need to go through each and every technical aspect related to it.This chapter provides an intrduction to the area of research. A brief Study and Survey has been carried out to understand various issues related to the project which invloves providing a smart electronic aid for blind people to provide artificial vision and object detection, real time assistance via using arduino. Our project mainly focuses on the visually impaired people who cannot walk independently in unfamiliar environment. The main aim of our project is to develop a system that helps blind people to move independently. Smart Stick for the blind stick
usually consists of three parts to help people travel with a greater degree of psychological comfort and independene: sensing the immediate environment for obstacles and hazards, providing information to move left and right and orientation during travel.
References

SRM PROJECT MANAGEMENT

Chapter 2

PROPOSED MODEL

➢ Theoretical Background

The proposed system consists of three main units :- Ultrasonic Sensor Unit, Arduino Unit and Audio Conversion part.

Ultrasonic Sensor - High frequency sound wave generated ultrasonic sensors.The time interval between sending the signal and receiving the echo is calculated by sensor to determine the distance to an object.

Arduino Unit - This module deals with the taking input from the obstacles coming across the way and giving output according to that input using sound notifications.

SKMP PROJECT MANAGEMENT

Chapter 3

COMPONENTS REQUIRED

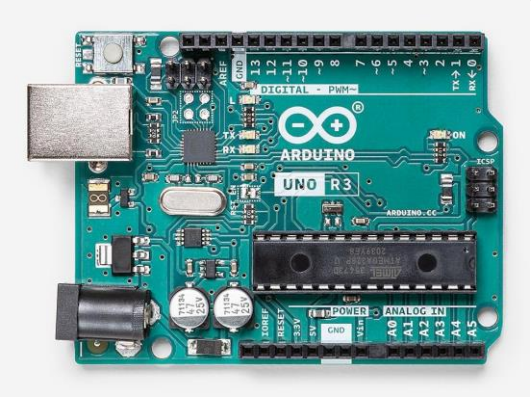
➢ Ultrasonic Sensor



(FIG-01 ULTRASONIC SENSOR)

(The HC-SR04 Ultrasonic Distance Sensor is a sensor used for detecting the distance to an object using sonar).

➢ Arduino UNO



(FIG-02 ARDUINO UNO BOARD)

SMART PROJECT MANAGEMENT

(The Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino cc.The board is equipped with sets of digital and analog input/output pins).

➢ Buzzer-



(FIG-03 BUZZER)

(A piezo buzzer is basically a tiny speaker that you can connect directly to an Arduino; from the arduino you can make sounds with a buzzer by using tone).

SKMP PROJECT MANAGEMENT

➢ 9V Battery –



(FIG-04 BATTERY)

The battery is used to provide power supply to the system for its operation.

➢ LED



(FIG-05 LED LIGHT)

(A light-emitting diode is a semiconductor light source that emits light when current flows through it).

SKMP PR AGEMENT

Chapter 4

CODE-ARDUINO UNO

```
// defines pins numbers
const int trigPin = 9;
const int echoPin = 10;
const int buzzer = 11;
const int ledPin = 13;

// defines variables
long duration;
int distance;
int safetyDistance;

void setup() {
pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
pinMode(echoPin, INPUT); // Sets the echoPin as an Input
pinMode(buzzer, OUTPUT);
pinMode(ledPin, OUTPUT);
Serial.begin(9600); // Starts the serial communication
}

void loop() {
// Clears the trigPin
digitalWrite(trigPin, LOW);
delayMicroseconds(2);

// Sets the trigPin on HIGH state for 10 micro seconds
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);

// Reads the echoPin, returns the sound wave travel time in microseconds
```

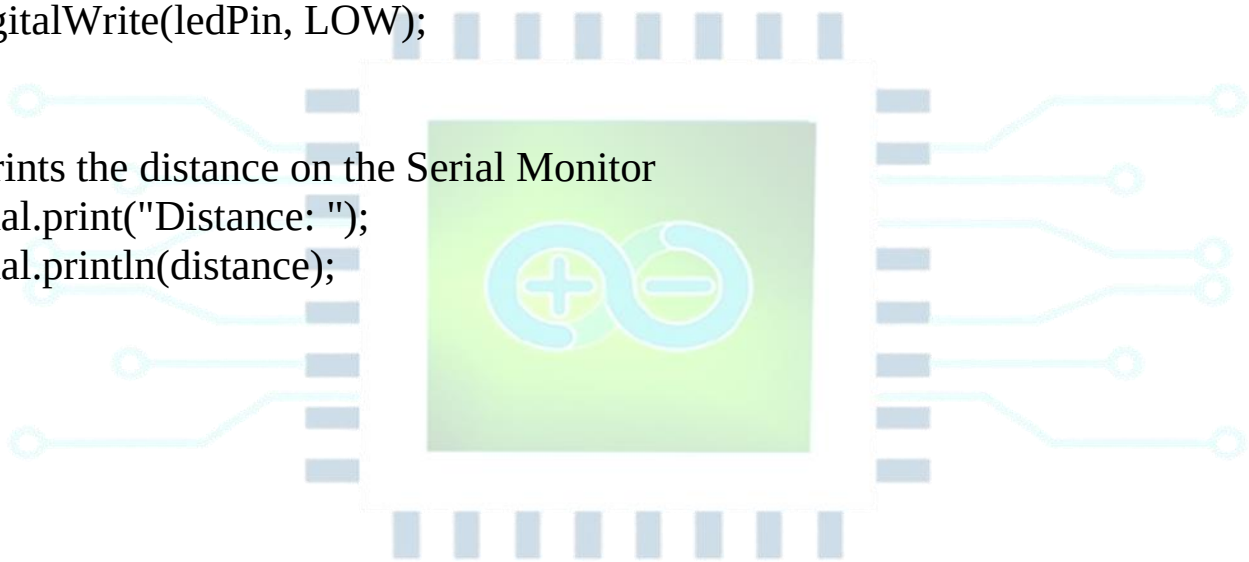
SKMP PROJECT MANAGEMENT

```
duration = pulseIn(echoPin, HIGH);

// Calculating the distance
distance= duration*0.034/2;

safetyDistance = distance;
if (safetyDistance <= 10){
  digitalWrite(buzzer, HIGH);
  digitalWrite(ledPin, HIGH);
}
else{
  digitalWrite(buzzer, LOW);
  digitalWrite(ledPin, LOW);
}

// Prints the distance on the Serial Monitor
Serial.print("Distance: ");
Serial.println(distance);
}
```

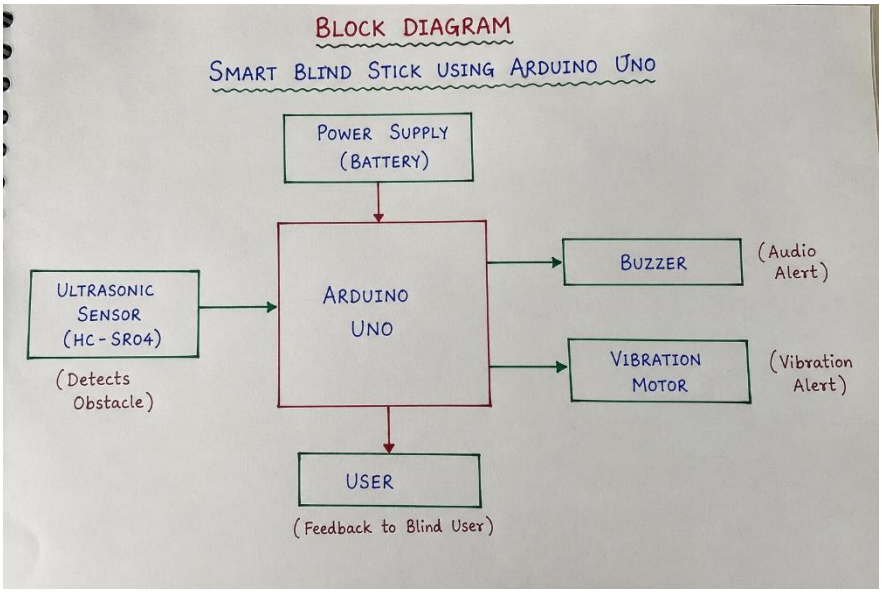


SKMP PROJECT MANAGEMENT

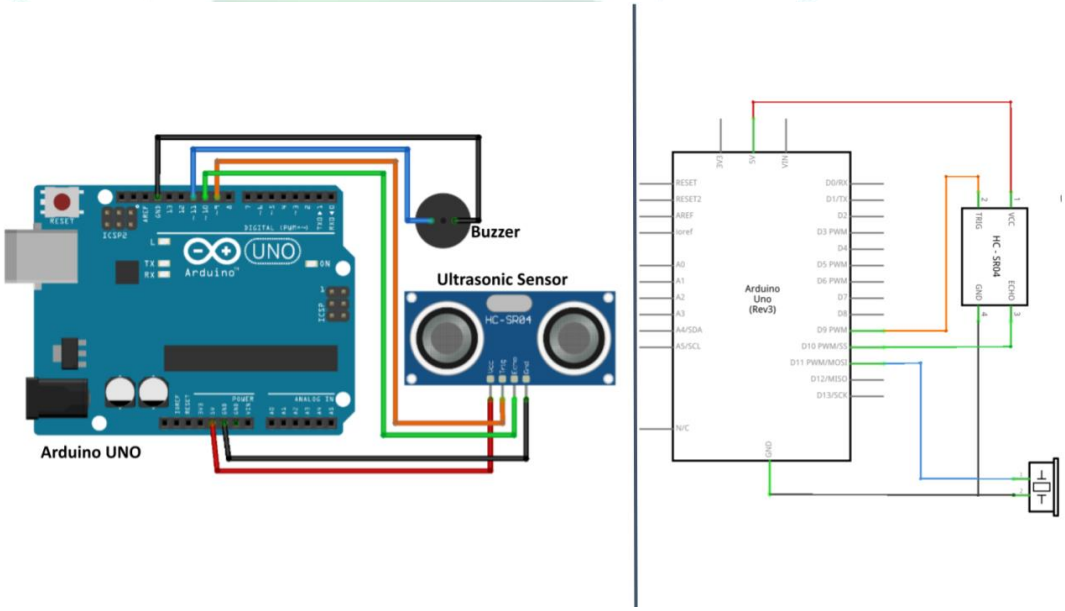
Chapter 5

METHODOLOGY

The working of the system begins when the power supply is given. The Smart Blind Stick will have an Ultarsonic Sensor, LDR, Arduino UNO, Buzzer.
All the components are connected to arduino UNO for processing.
ADC and DAC takes place in the Arduino. Additional navigation efficiency
is provided through Buzzer.
Basically, according to the distance assumed in the code , the ultrasonic sensors works according to that and if any obstacles comes across then blind
stick detects the obstacles as an input function.
Then, after receiving the input from the ultrasonic sensors , it will notify the
user by giving the notification in the form of sound.
This sound will be buzzer sound, ensuring the user is notified and saved from
the obstacles he/she comes across.
This is the video attached to make the methodology of the project more comprehensible.



(FIG-06 Block Diagram)



(FIG-07 Circuit Diagram)

Chapter 6

RESULTS AND DISCUSSIONS

➢ Results

The project was made with the working hardware model, detecting the obstacles if come
across any obstacles.
The blind stick proposed model can aid the virtually impaired user by helping him/her
navigate through different terrains and obstacles.
With the advanatges, that it is low cost , fast response, low power consumption, light
weight and ability receive the feedback through buzzer audio.
Detecting the obstacle with the help of Ultrasonic sensors and it can provide notification
to user holding it in the sound form via arduino buzzer.
Facilitiate easier comunication in case of emergency.



(FIG-08 smart blind stick diagram)

Chapter 7

APPLICATIONS

➢ Applications

It works as a navigation device for the blind people by alerting them about dangers.
The sytem is applied in automotive parking sensors and obstacles warning system.
It is applied during the measurement of object distance.
Robotics barriers.
Auto detection.
With little software and sensor up gradation, can extensible to any other application and
specification.

SKMP PROJECT MANAGEMENT

Chapter 8

PROJECT LINK

Website Link:- https://skmp-project-management.vercel.app/\

Google Drive Link:- https://drive.google.com/drive/folders/1Ko2JkPYZFAIxWImEFwLuxArNRtQWxw0i?usp=sharing

Video Link:- https://www.youtube.com/watch?v=QN3Lomx3LIc



Last Chapter

CONCLUSIONS AND FUTURE SCOPE

➢ Conclusions

The project proposed the design and architecture of a new concept of Smart Electronic
Guiding Stick for blind people.
The blind stick proposed in this paper can aid the visually impaired user by helping
him/her navigate through different terrains and obstacles.
The advantage of the system lies in the fact that it can prove to be very low cost solution
to millions of blind person worldwide.
The proposed combination of various working units makes a real-time system that
monitors psoition of the user and provide dual feedback maing navigation more safe and
secure.
It can be further improved to have more decision taking capabilities by employing varied
types of sensors and thus could be used for different applications.
It aims to solve the problems faced by the blind people in their daily life.
The system also takes measures to ensure their safety.

SMART PROJECT MANAGEMENT

➢ future scope

In future, we will be modifying the proposed model in better way . Initiating with the
addition of Bluetooth module for proper on and off functioning.
Integration of GPS module for detecting location of user , in case of an emergency.
GPS module will be integrated in combination of Bluetooth Module of Arduino UNO
connecting it to the mobile phone for better and smooth location detection.
Besides, soil moisture detector can be implemented for detecting the amount of moisture
in the soil , providing the safer access of the path to the user.
At last , inorder to improve the sound notification we are planning to impement sound
module which will give instruction in voice form.
The stick system presented in the paper uses artificial intelligence along with various
sensors in real time to help the visually disabled people to navigate their environment
independently. Image recognition, collision detection and obstacle detection are the three
tasks performed by the system.

References

References for a Smart Blind Stick project

- Loganathan, N. (2020). Smart Stick for Blind People. IEEE Conference Publication. Available at: https://ieeexplore.ieee.org/document/9074374/
- Smart Blind Stick Using Ultrasonic Sensor. ResearchGate, 2021. Available at: https://www.researchgate.net/publication/353795465_Smart_Blind_Stick_Using_Ultrasonic_Sensor
- Smart Blind Stick. International Journal of Engineering Research & Technology (IJERT). Available at: https://www.ijert.org/research/smart-blind-stick-IJERTCONV7IS10069.pdf
- Smart Blind Stick Connected System Using Ultrasonic Sensor. IJRAR. Available at: https://ijrar.com/upload_issue/ijrar_issue_20543652.pdf
- Smart Stick for the Blind Using Arduino. Journal of Physics: Conference Series, 2020. Available at: https://www.researchgate.net/publication/343186221_Smart_Stick_For_the_Blind_Using_Arduino
- Blind Stick Using Arduino UNO. IJSRSET. Available at: https://ijsrset.com/IJSRSET2076104
- Smart Blind Stick with GPS and GSM Based Assistance. IRJET. Available at: https://www.irjet.net/archives/V11/i5/IRJET-V11I535.pdf
- Arduino Project Hub. Arduino Blind Stick. Available at: https://projecthub.arduino.cc/hadi1234/arduino-blind-stick-b3157a
- Arduino Project Hub. Empower the Visually Impaired with a Smart Blind Stick!. Available at: https://projecthub.arduino.cc/jarvis08/empower-the-visually-

impaired-with-a-smart-blind-stick-841252
- Techatronic. Smart Blind Stick Using Arduino and Ultrasonic Sensor. Available at: https://techatronic.com/smart-blind-stick-using-arduino-and-ultrasonic-sensor/

Useful component references

- Arduino. Arduino UNO Rev3 Documentation. Available at: https://docs.arduino.cc/hardware/uno-rev3
- HC-SR04 Ultrasonic Sensor datasheet and Arduino interfacing guides.
- World Health Organization (WHO). Blindness and vision impairment. Available at: https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment

SKMP PROJECT MANAGEMENT



SKMP PROJECT MANAGEMENT

==========

SKMP PROJECT MANAGEMENT

DEPARTMENT OF IOT