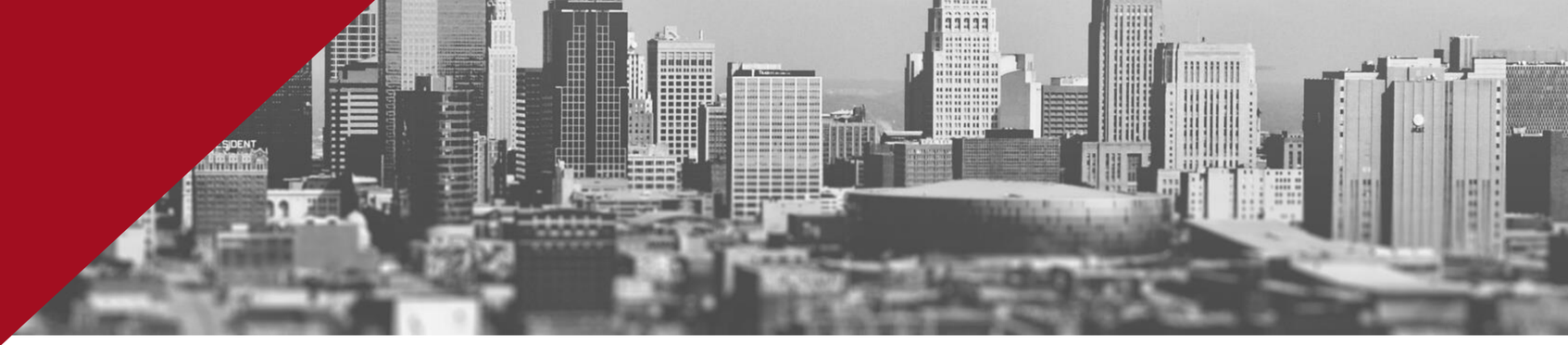
CAIRO UNIVERSITY
FACULTY OF ENGINEERING

2022/2023 preparatory year project

Special glove for sign language translation

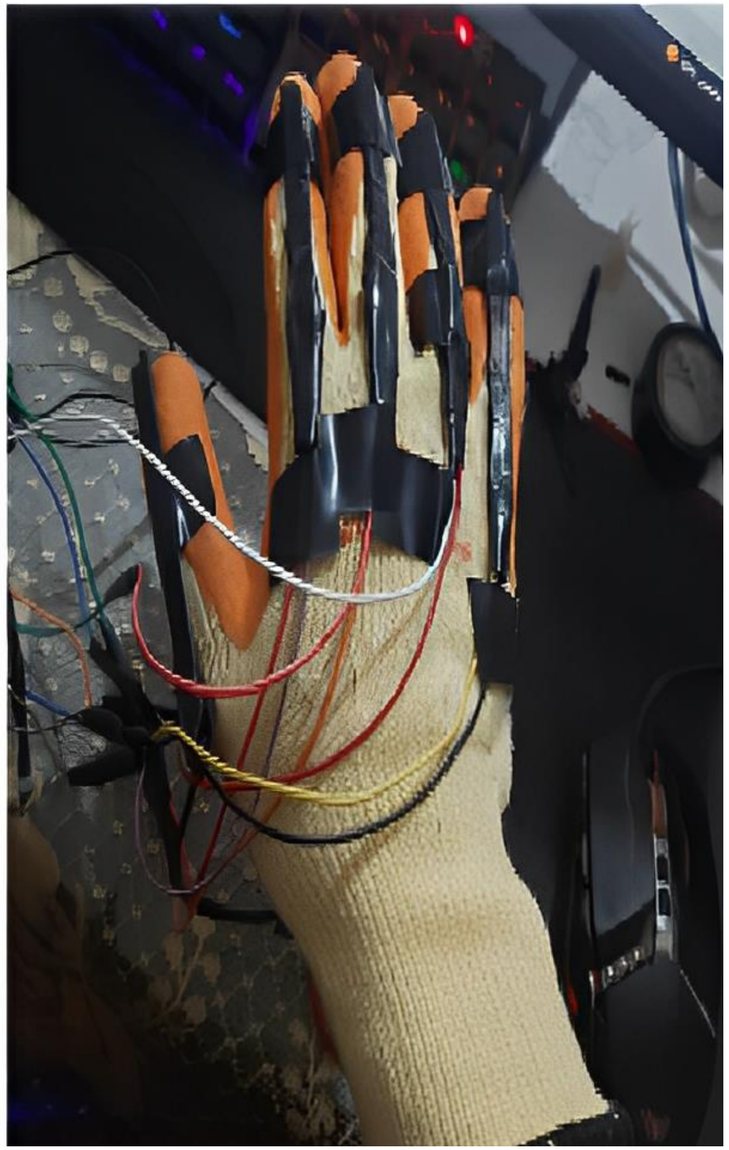
Under the supervision of Eng. Yasmine Youhanna

Names



1	Amr Samy Abd El-kareem
2	Amr Khaled Ashour Mohamed
3	Amr Hesham Mohamed
4	Amr Ashraf El-Sayed El-kadeem
5	Amr Abd El-baset Mohamed

6	Amr Mahmoud Mohamed El-Adly
7	Amr Usama Abd-El-wahab
8	Omar Mostafa Mahmoud Ahmed
9	Omar Mohamed Mahmoud



Introduction

- The Deaf and Mute community faces many challenges when it comes to communication.

- With the help of technology, we can create solutions that make their lives easier. One such solution is a glove made for the deaf and mute

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What is the Glove Made for the Deaf and Mute and what are its abilities?

The glove made for the deaf and mute is a wearable device that translates sign language into spoken language or text for seamless communication between the deaf and mute community and those who can hear and speak.

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Methodology

How does the Glove Work?

The glove is equipped with sensors that detect the movements of the wearer's hands and fingers.

These sensors then transmit the data to a small computer in the glove, which analyzes the sign language being used and translates it into spoken language or text.

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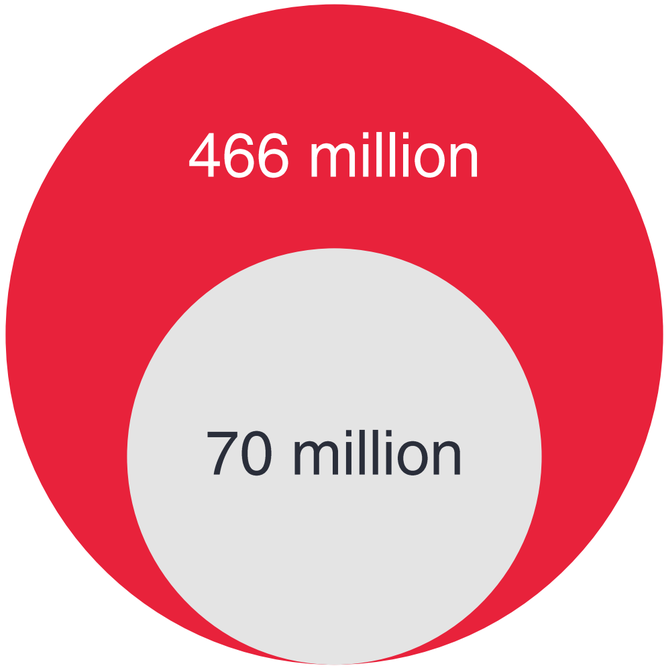
Market Demand for the Glove

people worldwide with disabling hearing loss

466 million

Those who use sign language as their primary means of communication.

70 million



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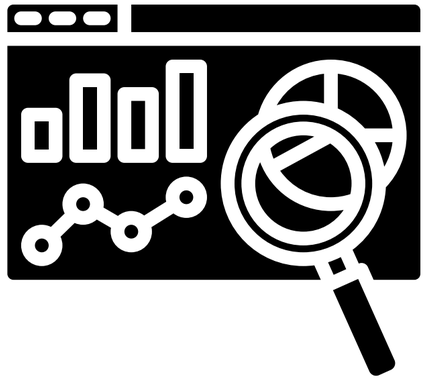
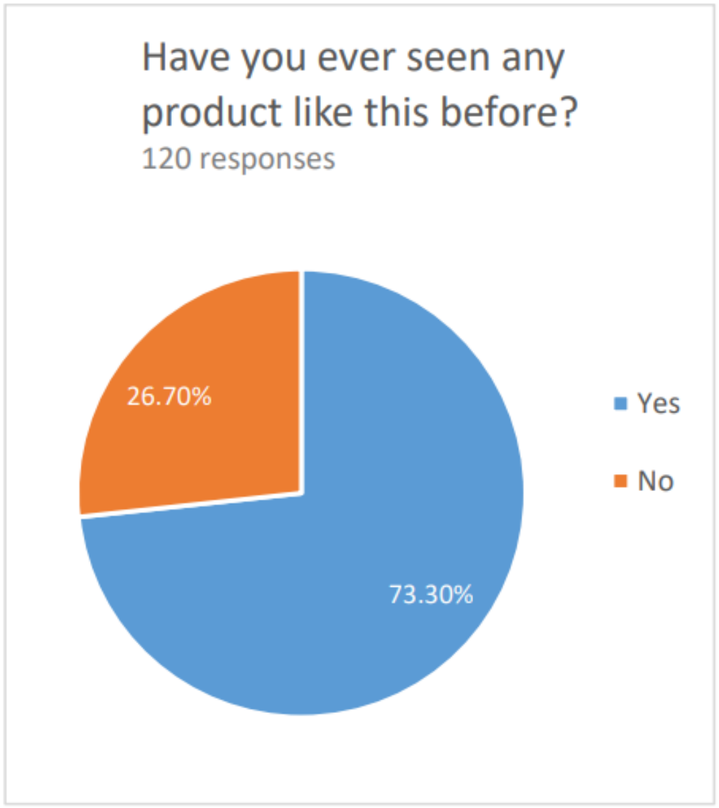
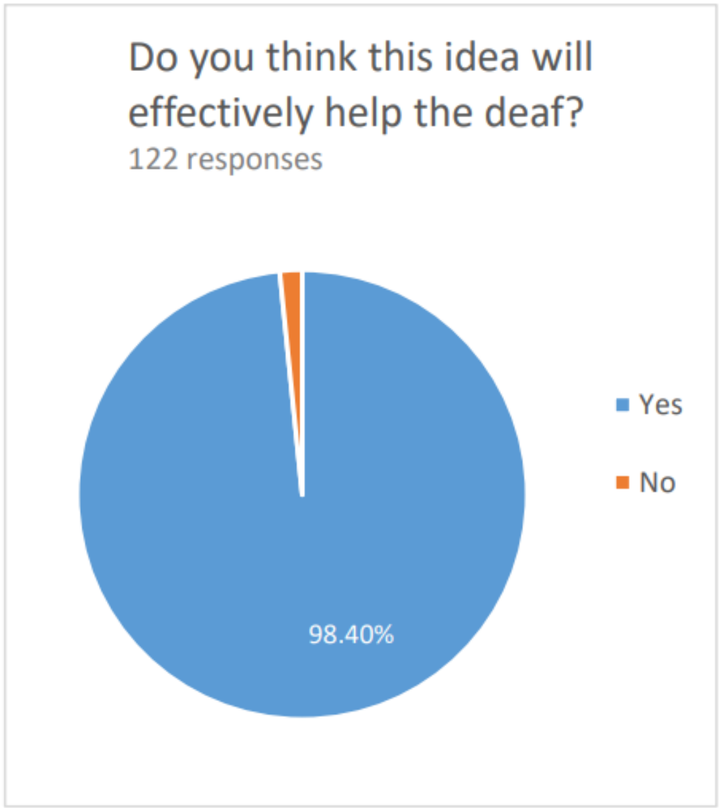
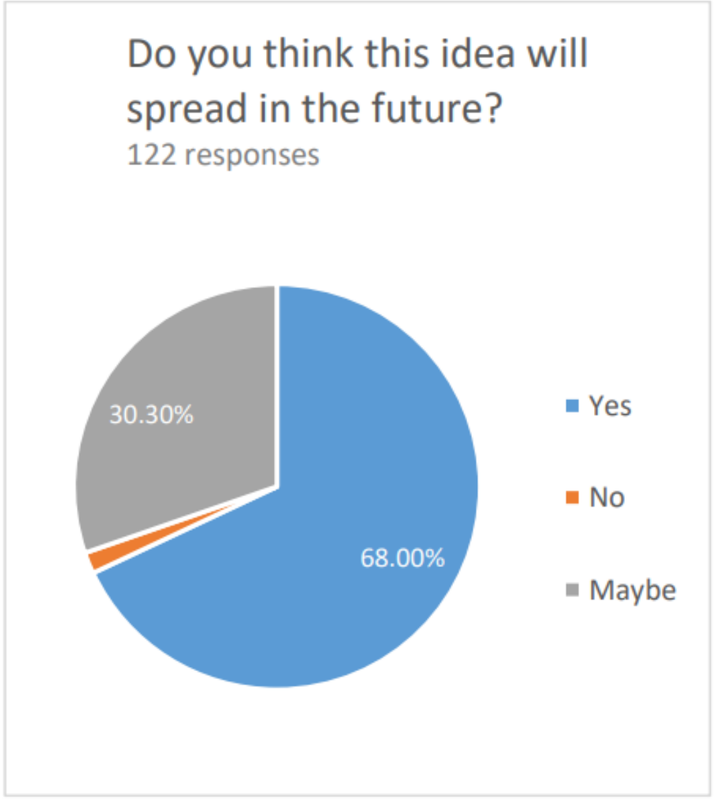
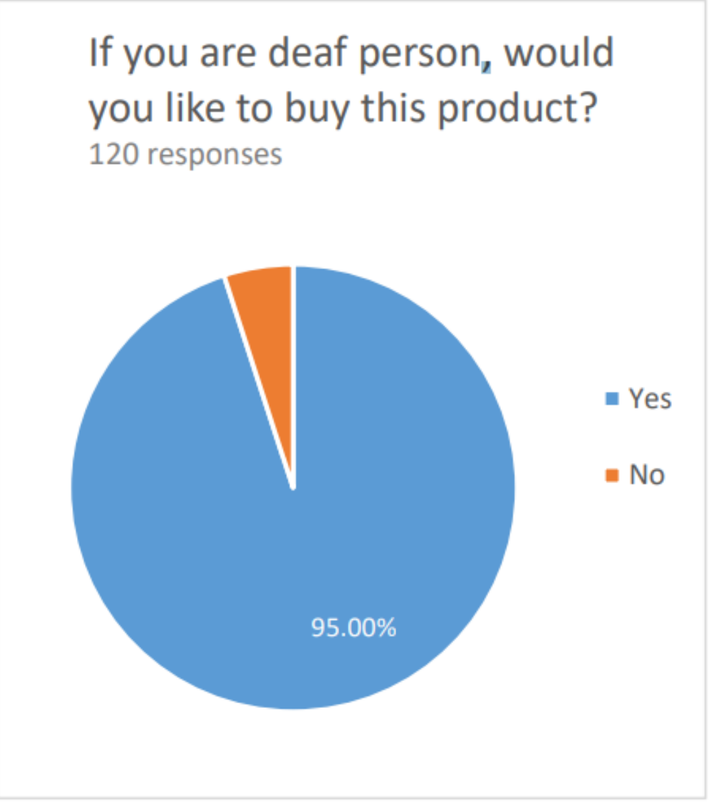
Market Research And Customer Feedback

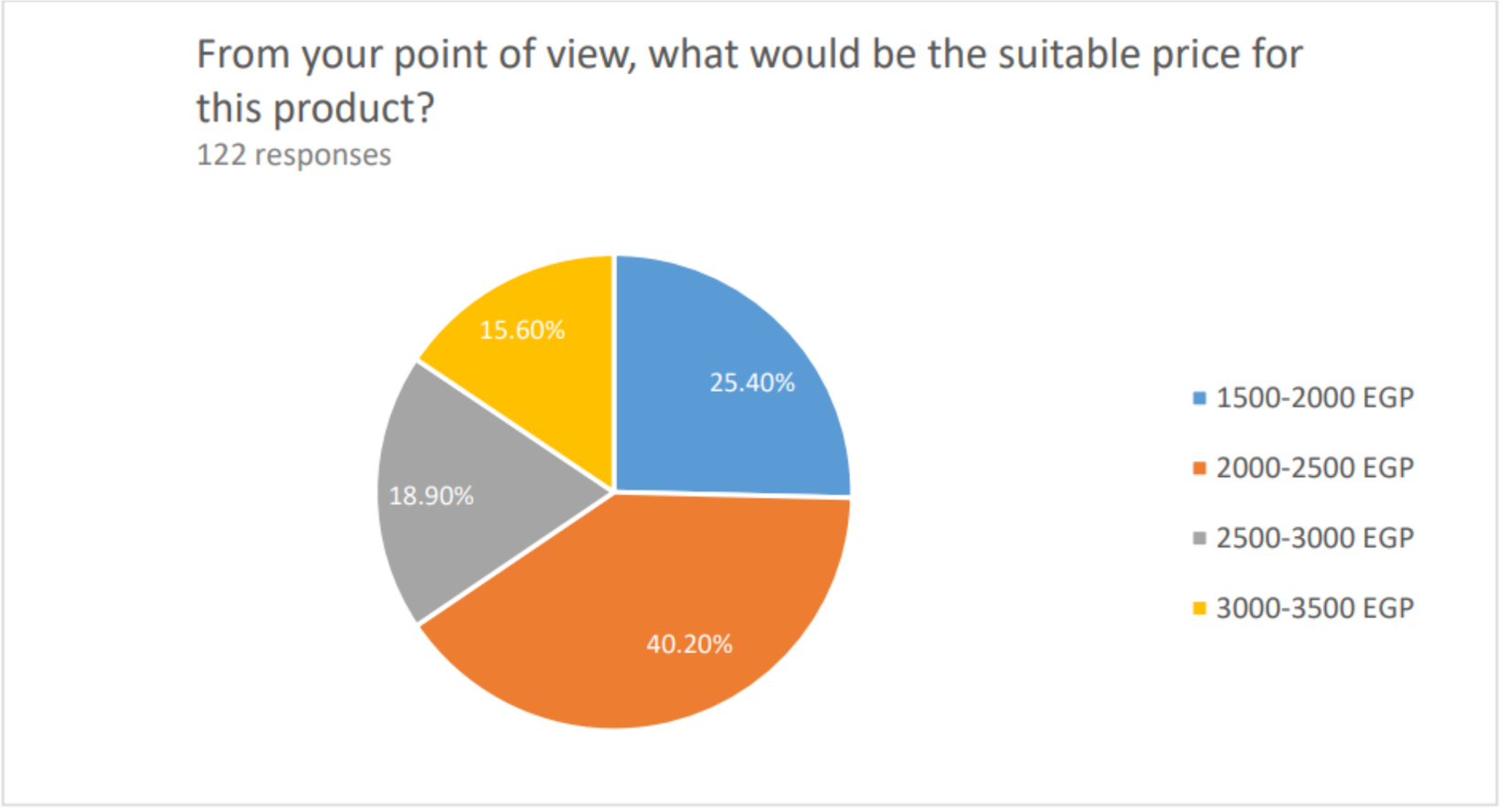


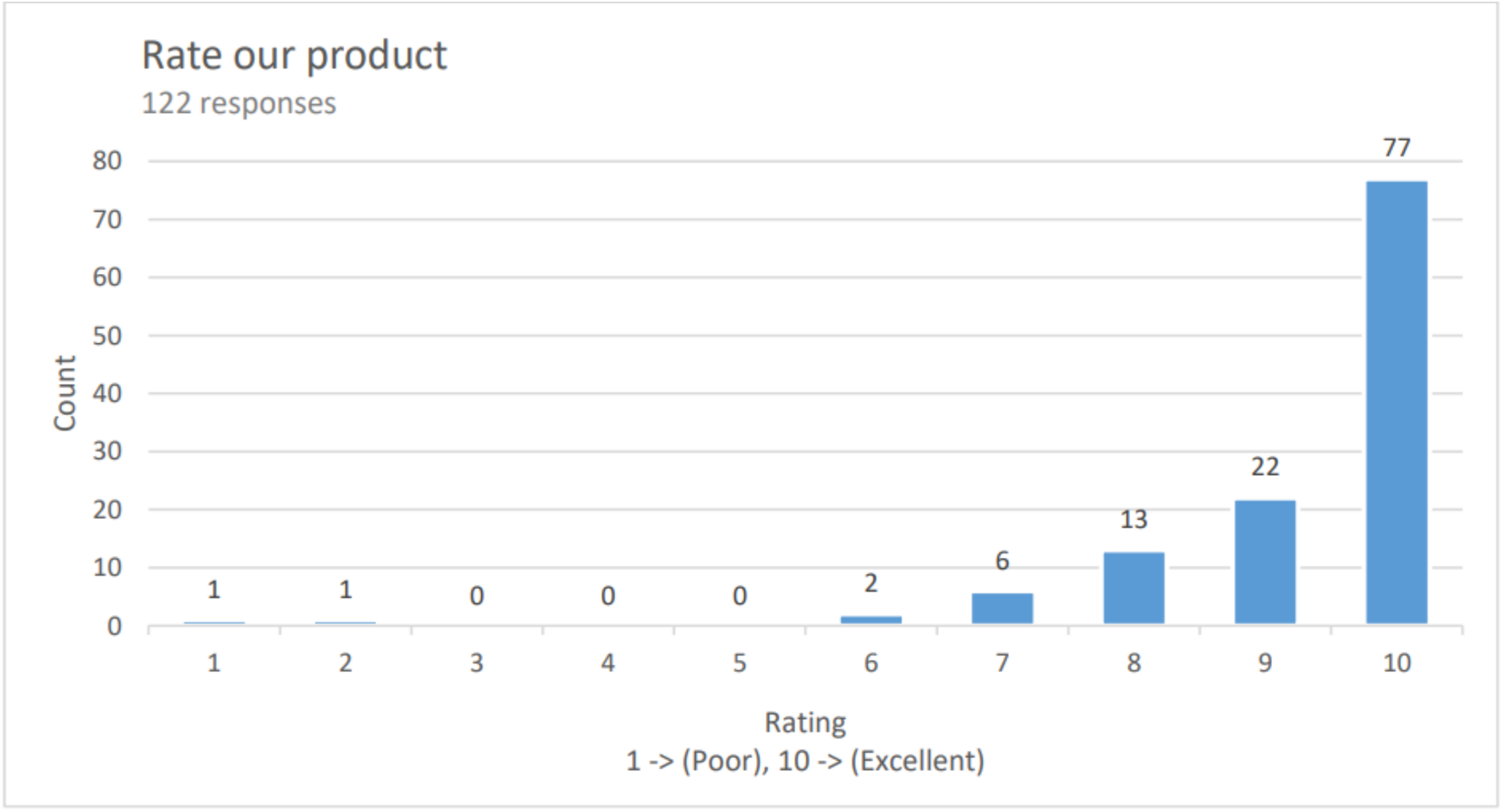




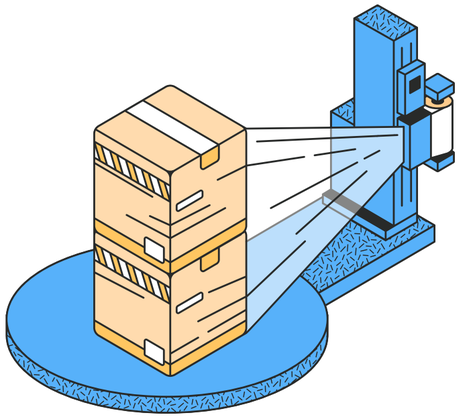

Do you think this idea will spread in the future?
122 responses
30.30%
68.00%
Yes
No
Maybe


If you are deaf person, would you like to buy this product?
120 responses
95.00%
Yes
No

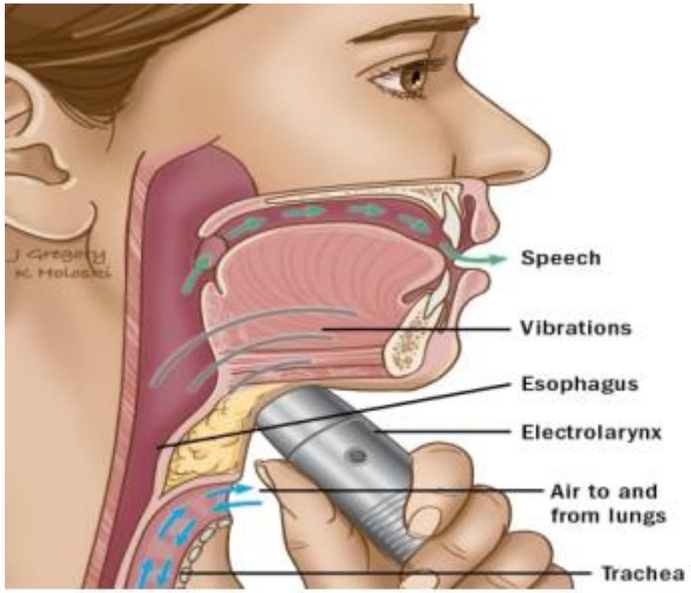

From your point of view, what would be the suitable price for this product?
122 responses
15.60%
25.40%
18.90%
40.20%
1500-2000 EGP
2000-2500 EGP
2500-3000 EGP
3000-3500 EGP


Rate our product
122 responses
Count
80
70
60
50
40
30
20
10
0
1
1
0
0
0
2
6
13
22
77
1
2
3
4
5
6
7
8
9
10
Rating
1 -> (Poor), 10 -> (Excellent)

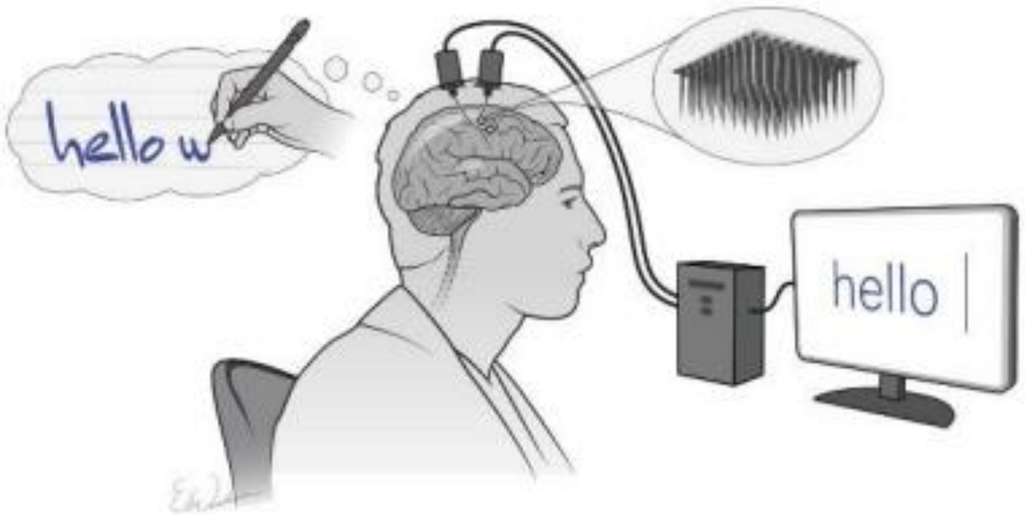
Literature Review



- Electronic larynx



2. Brain-computer interfaces (BCIs)



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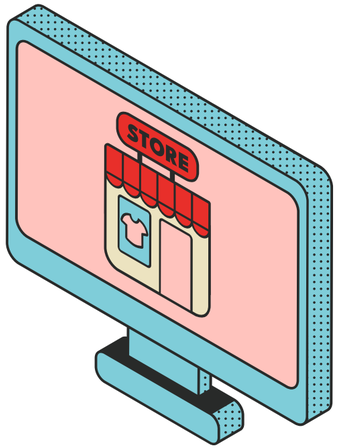
Materials



Materials	USE
Arduino Nano	Microprocessor
Flex Sensors	Gestures reading
SD card	Storage for sound files
SD card reader module	Read sound files
LM386 amplifier & 8Ω speaker	Play sound files

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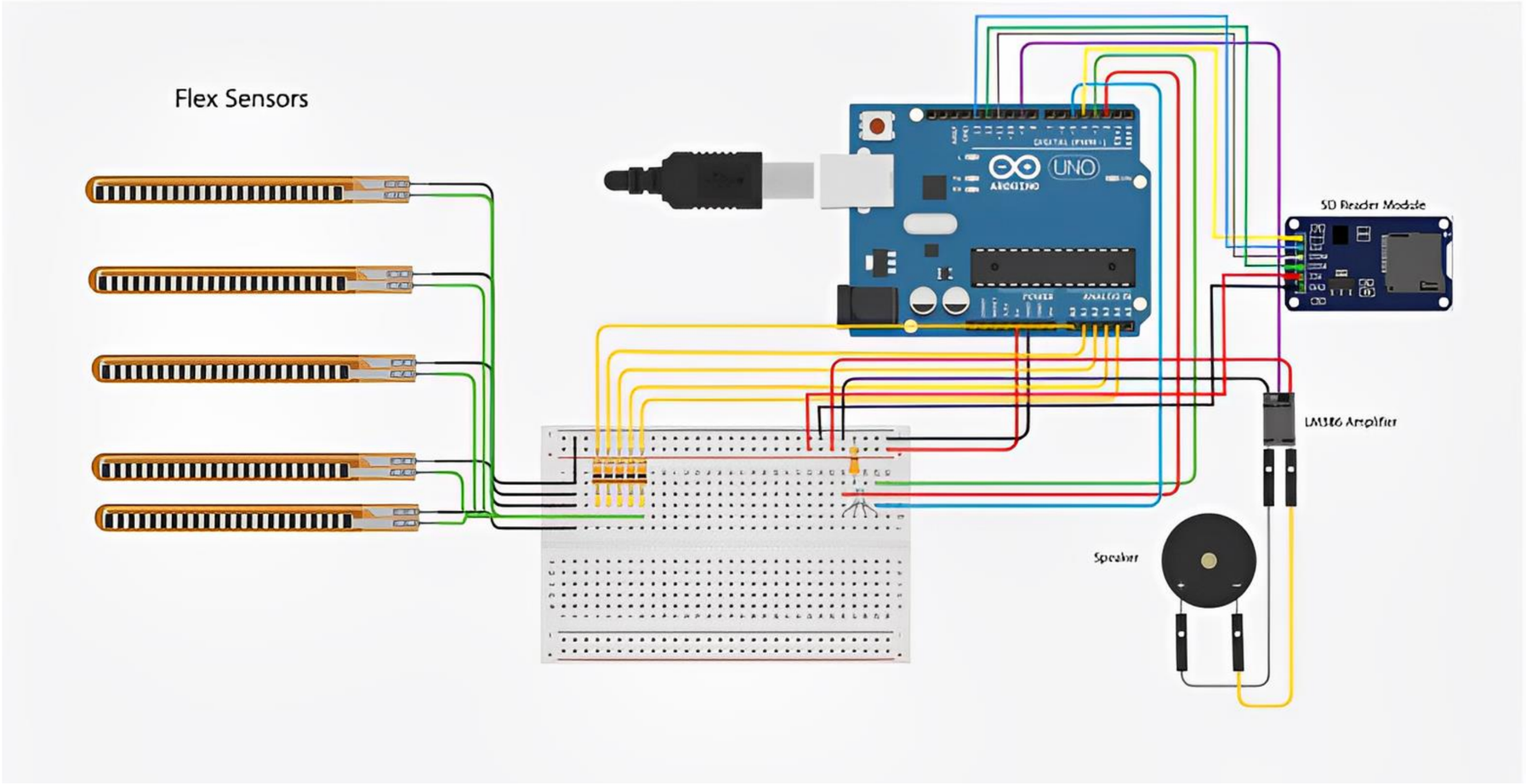
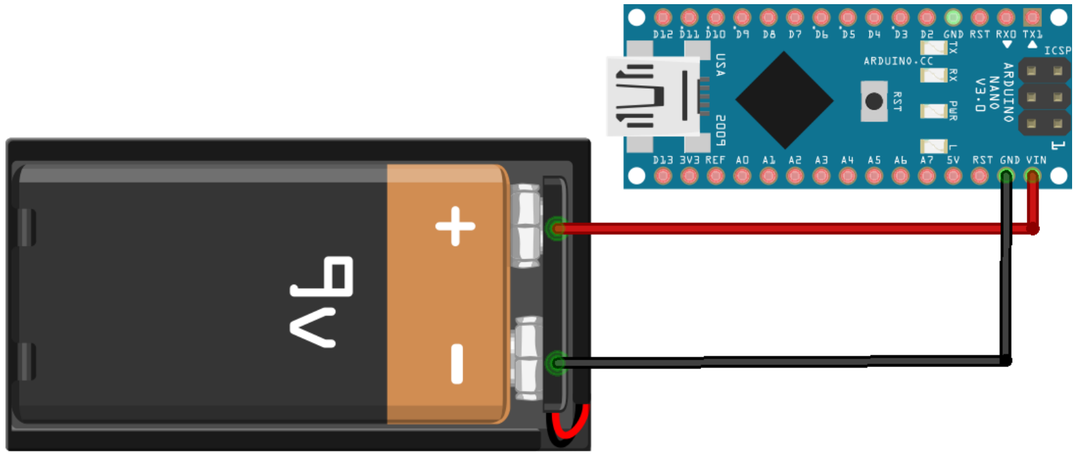
Project Connection



Project Specifications

- Power source: 9V battery
- maximum output current: 40mA (or 20mA continuous current).
- Arduino Nano gives analog output in range of 0 to 255.

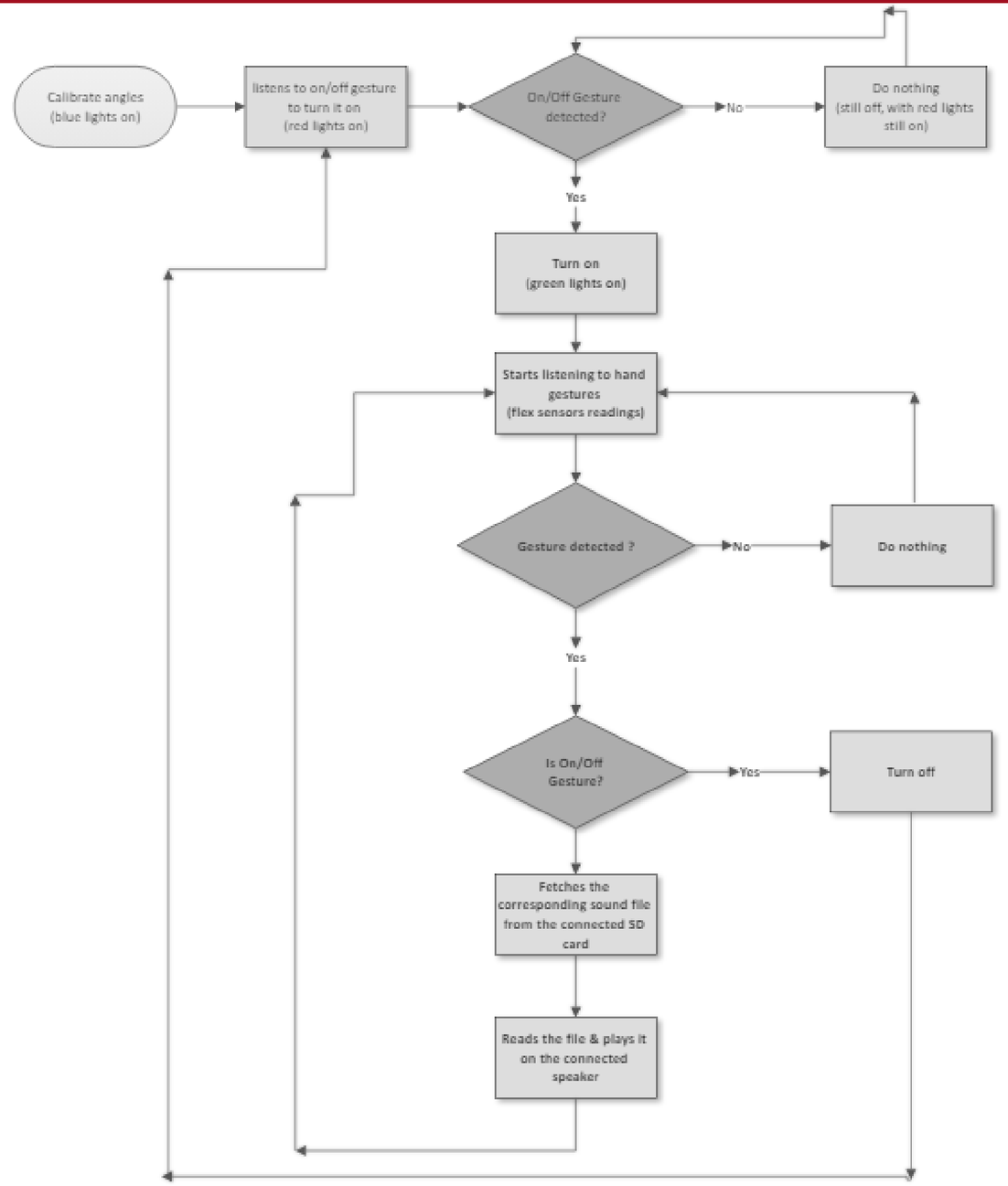


Project Mechanism

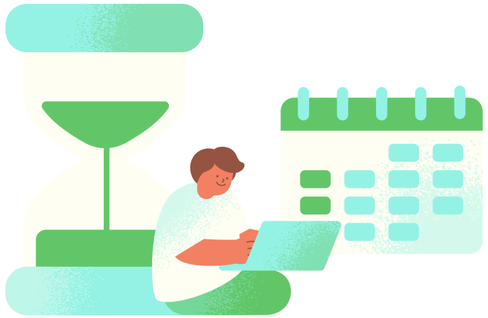
The smart glove recognizes a specific set of hand gestures and toggles its on/off status when the user performs a specific gesture. The Arduino uses flex sensors to measure the degree of bending or flexing of the sensors and compares the current gesture to a set of hard-coded gestures. If it matches a gesture in that list, the device compares that gesture to another list that has the translated text value or sound file name of each gesture, and then plays the sound using the speaker. The gesture detection is hard-coded into the Arduino, and the green light indicates that the device is on and ready to listen to sign language gestures.

Project Mechanism

1. Calibration Process
2. Off by default
3. Gesture Detection Process
4. Sound Playback



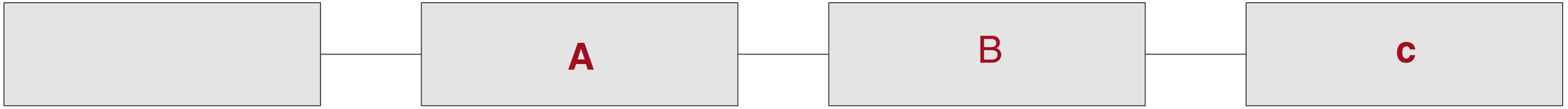
Results



A glove has been developed that allows the deaf to communicate with people who do not understand sign language. The glove has 5 flex sensors, a Nano Arduino, an SD module, and a speaker, and works by allowing the user to make a special sign that triggers the speaker to spill out the corresponding character or phrase.

The glove's accuracy in determining which phrase the user intended to choose is satisfactory, despite the 30 different movements that one hand can make. The glove has been found to be easy to use, accurate in translating hand movements into speech or text, and effective in improving user satisfaction with communication.

Recommended Future Developments



The glove made for the deaf and mute has the potential for future development, including the following

A

Integration with other assistive technologies, such as cochlear implants and speech-to-text software

B

Expansion to include additional sign languages and spoken languages

c

Integration with wearable devices, such as smartwatches and smartphones

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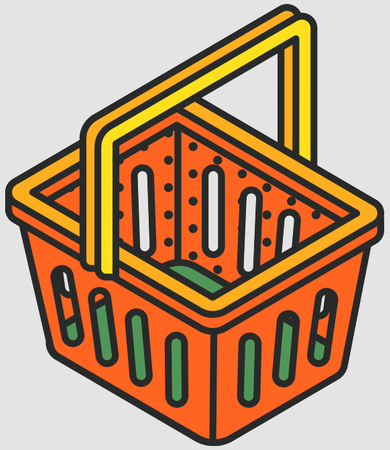
In Conclusion



The glove made for the deaf and mute is an innovative and valuable product that has the potential to improve the lives of millions of people worldwide. With its real-time translation capabilities and customizable settings, it can facilitate communication and increase accessibility for the deaf and mute community.

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Thank you!