CHAPTER 4

REQUIREMENTS

4.1. Hardware Requirements

4.1.1. List of Hardware Components

a) Microphone

b) Bluetooth Module(Major)

c) Arduino(Major)

d) USB

e) Jumper Wires

f) Bread-board

g) Arduino Cable

4.1.2. a. Description of Hardware Component

Fig. 1: Bluetooth Module

Bluetooth Module

- Model: REES52
- Vendor:Amazon
- Price:Rs 370
- Spec: TTL output HC05

Component Functionality: HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband.

Application: For connecting smartphones and the computer so that the commands can be taken from smartphone through bluetooth.

Reference
URL:https://www.itead.cc/wiki/Serial_Port_Bluetooth_Module_(Master/Slave)_:_HC-05

Fig. 2: Arduino Uno

Arduino Uno

- Model: Arduino UNO R3 board
- Vendor: Amazon
- Price:499 Rs
- Spec:

Component Functionality:The Arduino Uno is a microcontroller board based on the ATmega328. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs), a 16 MHz resonator, a USB connection, a power jack, an in-circuit system programming (ICSP) header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer (or appropriate wall power adapter) with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Application: Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

Reference URL:https://www.pololu.com/product/2191

Summary of Components in Tabular form

S.No	Item	Model	Spec	Vendor	Price In Rs.
1	Microphone	L22	NA	Amazon	100
2	Bluetooth Module	REES52	HC05	Amazon	370
3	Arduino	UNO R3	NA	Amazon	499
4	USB	Model 3	NA	Amazon	40
5	Wires	NA	NA	Local Store	10

Table 1: Summary of Hardware Components

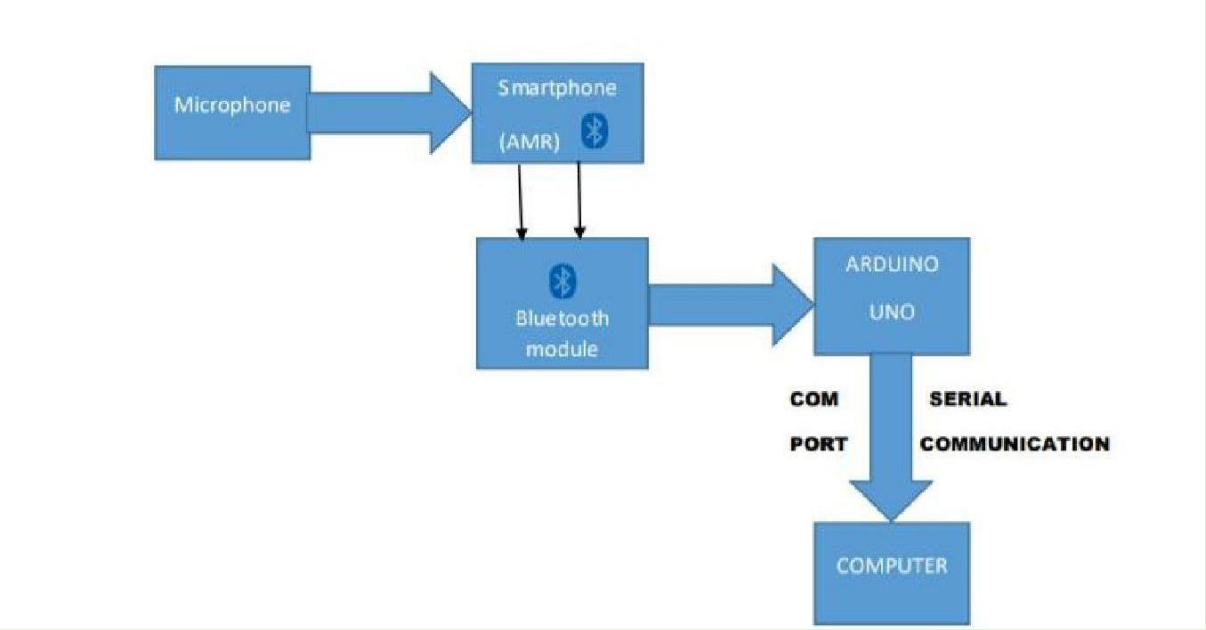
4.2. Software Requirements

S.No	Item	versions	Spec	Vendor	Price	Description
1.	Bluetooth Arduino Mobile Application	NA	NA	Play store	Free	For giving voice commands using smartphone.
2.	Windows Operating system	Windows 10	NA	Microsoft	Free	For implementing our product
3.	Arduino and Python IDLE	Python 3	NA	Python	Free	For code compilation and implementation

Table 1: Summary of Software Components

CHAPTER 5
Architecture

The architecture in the figure below explains the processing of our project, according to which the user will give the voice commands using microphone and with the Bluetooth module these commands will be processed in the Arduino UNO and will convert the voice commands in the computer language and with interact with the system using the python code and process and display the action accordingly.



CHAPTER 6
DEVELOPMENT DETAILS

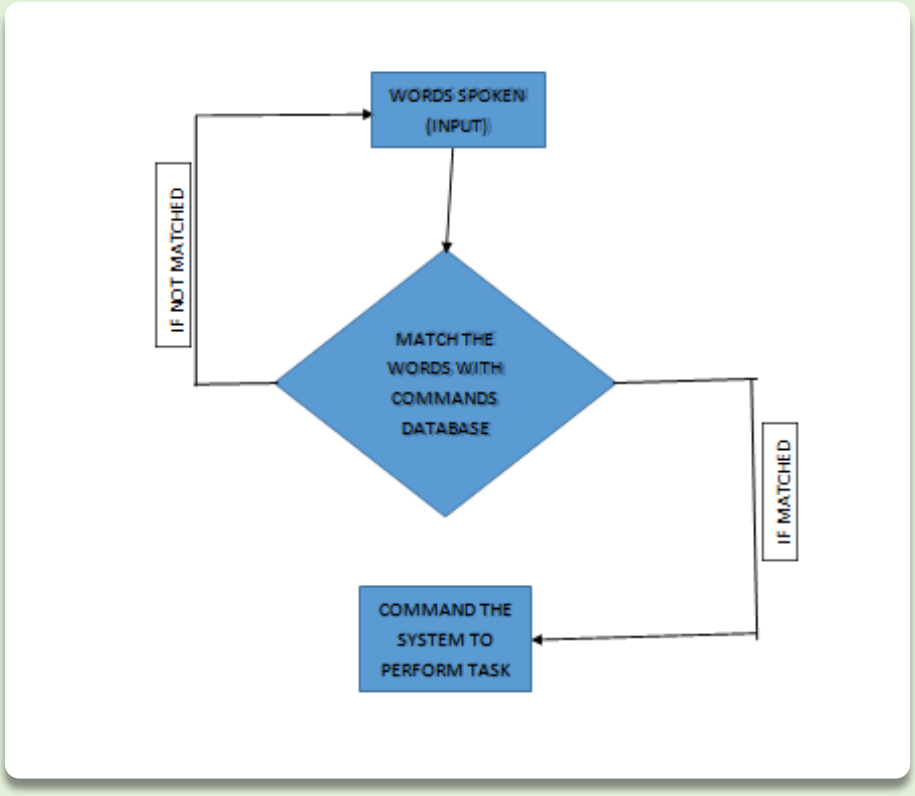
In Information Technology, the user interface (UI) is everything designed into an information device with which a person may interact. This can include display screens, keyboards, a mouse and the appearance of a desktop. It is also the way through which a user interacts with an application or a website. The growing dependence of many companies on web applications and mobile applications has led many companies to place increased priority on UI, an effort to improve the user's overall experience.

Expected Output:
The product built is User Automation System that takes in voice commands from the user to automate basic functions in the system such as opening, closing and navigating through files and applications in a system. Additional features are given to the automation system in relation to manipulation of slides in a power point presentation.

The functions of the product attained as of now are as follows:
1. Opening and closing applications
2. Start typing in a text field or text documents
3. Searching anything on web browser

The functions of the product to be attained are as follows:
1. Mouse click manipulation
2. Mouse pointer control
3. Power point presentations control

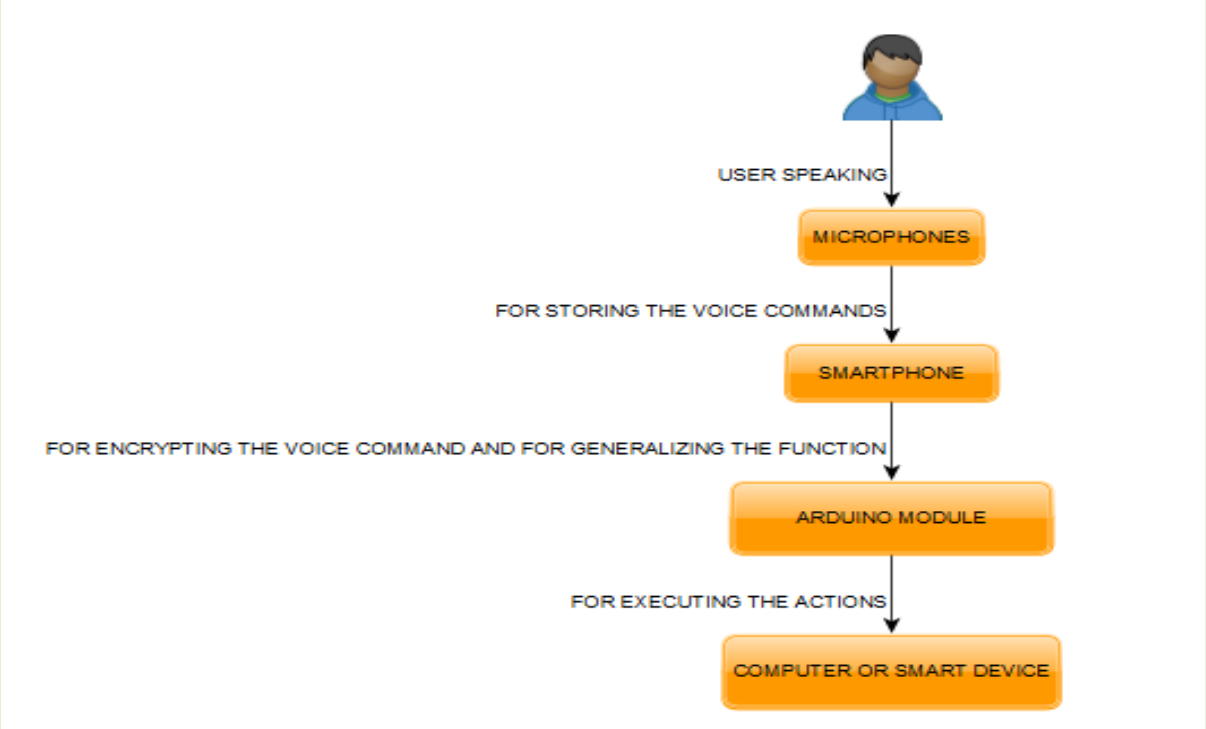
Algorithm:



Software required:

- Python 3.7
- Arduino and python IDLE
- Speech Recognition libraries
- Windows operating system
- Google API

Model Flow Chart:



Assumptions and Dependencies:

1. The automation system cannot be expected to have access to hidden files and folders in a computer and thus will not be able to operate on applications and files that are stored or fall under this category.
2. The automation system can only open files and applications from a specific directory. Applications and files in other directories are inaccessible to it.
3. Time delay: the system takes a few seconds to establish serial communication only after which it can take any input.
4. If there is noise in the environment where the system is being used, then the automation system will not be able to take inputs properly.

User Characteristics: The user of the automation system designed is expected to be:

1. Familiar with basic commands that will be used in the voice command application. For example, OPEN for opening an application or file, NEXT for going one page up in a text file or moving on to the next slide in a slideshow.
2. Able to provide voice commands in a clear and legible manner to the system.
3. Familiar with basic operations that can be performed on a file or application
4. Requiring special handling of power point presentations

Modules for the Project: Different Command Sequences for different modules of the project
For Mouse Control: We can control the mouse according to our commands that we will give on the voice control.

1. Enable mouse control
2. Left click
3. Right click
4. Double click
5. Done (For ending the program)
6. Up
7. Down
8. Left
9. Right
10. Slightly up
11. Slightly down
12. Slightly left
13. Slightly right
14. Right diagonal up
15. Right diagonal down
16. Left diagonal up
17. Left diagonal down

For Screenshot: If we want to take a screenshot, we must follow these commands

1. Take a screenshot(Give the name for PNG file)
2. Yes

Open a Presentation: If we must show a presentation, we can use these commands

1. Open presentation (Give the name of ppt file)
2. Next
3. Back
4. Close presentation

Open a Browser for Search or Opening a Website

1. Open Chrome
2. Search (Give Search Text)
3. Scroll up
4. Scroll Down
5. Next link
6. Done (for getting out of link selection)
7. Done (for closing)
8. Close Browser

Take a picture

1. Take a picture

Read Content of word file

1. Read a word file (name of docx)

Creating a Word File

1. Create a word file (Name of the document)
2. Start typing
3. Add heading (Enter Heading)

4. Next page
5. Full stop (.)
6. Comma (,)
7. Next line (Enter)
8. Question Mark (?)

Close an Application

1. Close application

Close System

1. Goodbye

CHAPTER 8
Applicability category

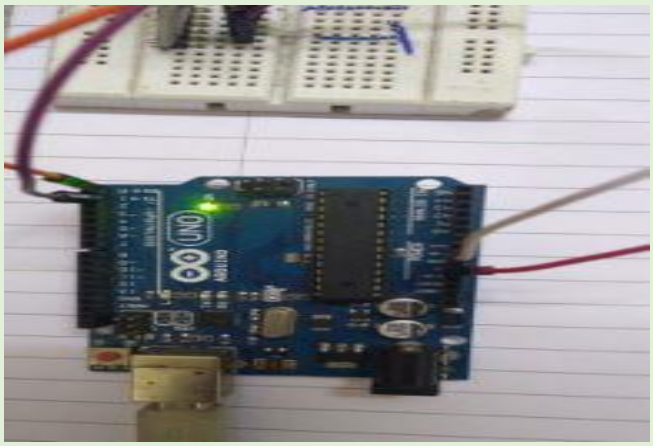
1. Society relevant: The project is mainly to automate the user interface for handicap people specially who have some order of non-functioning of hands and fingers, so that they can interact with the computers (Pc's) in the same manner as the normal people and do not face problem in writing a documents or movements of presentation (Left, right, up, down)or giving any other commands.

2. Social Networking: Our system will help these people to interact with the society in a good manner by accessing the social networking websites like facebook, twitter, gmail just by giving some of the vocal commands and hence the social networking system much better and strong.

3. Team involvement: Each and every member has gives the best efforts to make the project successful by dividing the work according to their skills and make a project great success.

Module	**Involvement**
Python software development	Suyash Gupta Krati Agarwal
Speech recognition module	Belal Ahmed Sankalp Mittal
Testing , surveying and documentation	Anup Mandhana

4. Hardware based: The hardware structure of the proposed project is simple and easy to understand, it only consist of the Arduino connected with the Bluetooth module, which is connected with the computer in which the voice commands will process and in Arduino the circuit is made with the help of some jumper wires using breadboard.



Chapter 9
CONCLUSIONS

In this project “User Interface for Handicapped People” we tried our best to automate the system of user interface as much we can so that it can be productive for the people who really need it and hence trying to solve one of the major problems of the society.

This type of system can also be implemented in the school, colleges or offices in order to make the process easy for giving the process of presentation and hence making the system more modernized and human friendly.

This will bring revolution in the world of handicapped people and the cost of project is all very less so it can be easily afford by all the people and in all types of schools and colleges(government) and the project has very less hardware setup so can be integrated with any system.

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