# Smart Drawers

**Project under VJTI-MUMBAI**
**Program: Eklavya-2k17**

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AND
ENJOY AAM

# Smart Drawers

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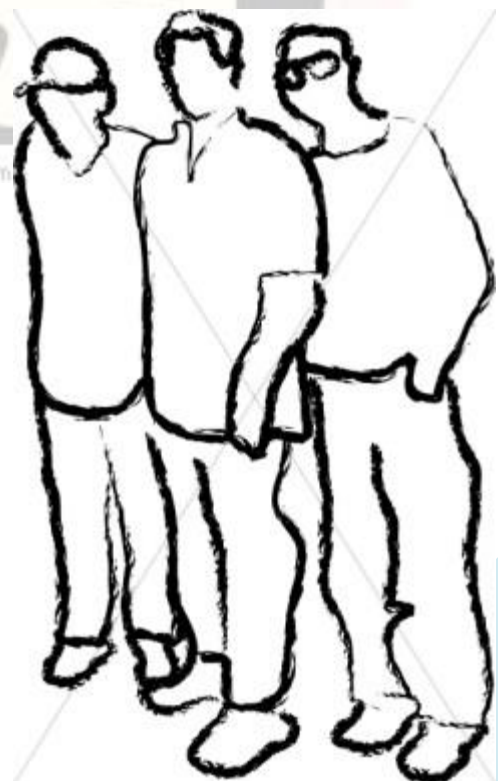- **M**ayank Mahure
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*That's the secrete behind AAM!*

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*Smart Drawers*
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# *Introduction*

## *What we are trying to do?*

The advancement of technology has helped us to create such an innovative project. This will change the daily working of a common man and will help him/her with his/her daily chores.

In our normal routine, we have been opening hundreds of drawers or hundred times a single drawer in a day. Remembering what has been kept in which drawer and then opening all the drawers to find the desired object, makes us feel irritated all the times. So here is a solution to this problem, these are voice activated drawers which will not only take care of remembering things which you have kept inside but will also open the drawer which includes the item.

So get ready to say it loud and clear, because you just have to speak it out and the item will be in front of you in just seconds.

# *Things you will need*

- Esp 8266 (Wemos D1 R2 mini)

- Android smart phone

- Motors (30 rpm)

- Arduino UNO

- Drawers

- Wires
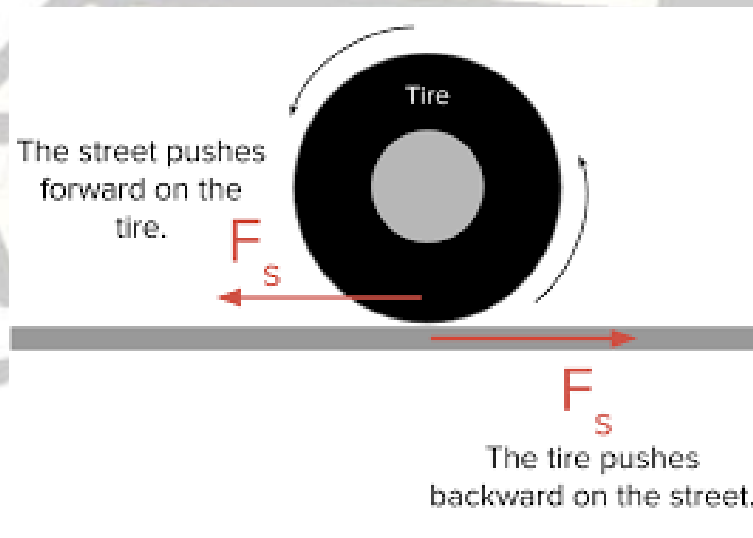
- Sand paper

- Wheels

- Stoppers

# Mechanical aspect

*Where are Nuts?*

Generally, you would have seen tires placed vertically on the road, but we have placed them horizontally in alignment with our drawers. The tendency of slipping between the drawers and the wheels induces a friction which is the only cause for the movement of the drawers. A diagram below depicts the physical working of it.



The amount of frictional force is directly proportional to the coefficient of kinetic friction; hence to increase the force we have introduced sand paper between the wheels and the drawers.

For the rotation of the wheels we have used johnson motors having a speed of 300rpm and an intake of 12 volts. Stoppers have been put on the drawer to stop it from coming out.

# *Electrical work*

## *Let's pass current*

The motors are connected to the Arduino (not directly) with the help of wires. Since the intake of the motors is more than the output of the board, current amplification is required. To obtain this we have used two motor drivers (L293d) which in turn is connected to the motors. The arduino board is supplied with a power source of 5 volts. The esp8266 can be powered through the arduino board or via an external power source depending upon the user.

Arduino UNO                Esp8266                L293d

# *Computer Programming*

*It's Coding time!*

In order for proper working of the project, logical coding must be done in three devices viz. Arduino, Esp8266, Android device.

Software's required:

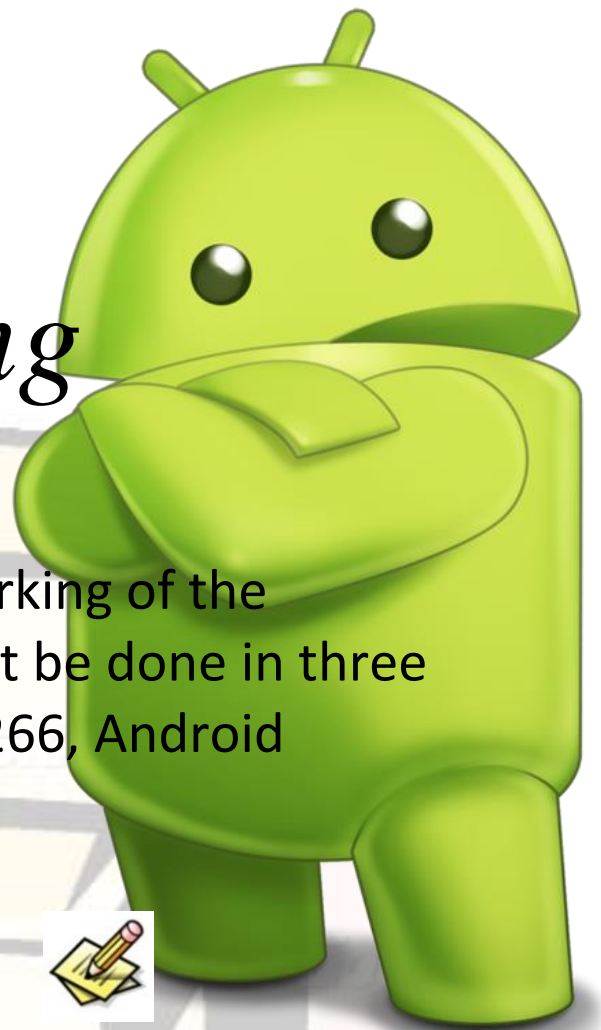1. Programmers Notepad

2. Arduino

3. Drivers Toolkit

4. Android Studio

Before trying to burn any of the codes make sure that you have the required driver installed in your system. The Drivers Toolkit will notify you if it finds any of the drivers required.

<u>Programming the Arduino:</u>
Open programmer's notepad. You need to set the baud rate i.e. the rate of transfer of data. Set the required flags. Save your code as main.c. Then build and burn it on the board. The tool will convert your .c file into a. hex file before burning it on the board. This will improve the processing speed and will result to a better performance.

<u>Programming the ESP8266:</u>
Before trying your code, you can try sample codes (blink test) available in the file menu. You can use the serial monitor to check the implementation of your code. Make sure that you select the correct port from the port manager.

***<u>Here is the link for our code for Arduino and ESP8266:</u>***
https://drive.google.com/file/d/0B615bLkBbGDFWVFXWEZaVFN3M00/view?usp=drivesdk

Programming the Android device:

We have created an android application which takes input from the user as speech. The app then sends a request to the google voice search to convert the speech into a text. The google app sends back a text to our application. Based on the text received our application makes a corresponding request to the server.

***Here is the link for our code for Android:***

https://drive.google.com/file/d/0B1WaRLpWG7tKaUhOR2QtZUo3RlU/view?usp=drivesdk

***Here is the link for Ready Made App*** :

https://drive.google.com/file/d/0B615bLkBbGDFeDlLQ0x2cmNuMVE/view?usp=drivesdk

# How it Works?

The first step is to open the application (AAM) in your android device. Press the button containing a microphone in it. As soon as you press this button the app will send a request to google voice search and will record your voice. Tell the application the item you want from the drawer. It will convert it into a text and will return to our application. Our application based on the text received will make a request to the web browser to a http link. This request will then be received by the esp. The Esp will transfer this piece of data to the arduino. Arduino based on the data received will set the motor to on and of position and will also tell the direction of rotation of the wheels. This will open or close the drawer that you had requested.

# *Implementation*
## *Where it's use?*

These drawers can be made to use for any type of purpose, from a kitchen drawer to a drawer used at industrial level. These can be used in offices very the request can also be sent from a laptop. They can be used in libraries as a very handy technology. The user need not search for the book and will just have to say the book he/she wants and the drawer containing the book will open automatically. He/she just needs to get to the drawer.

These can be converted into any voice activated device just by changing the mechanical part and leaving other things as it is. What say about a complete voice activated house???

# *Result*

## *Its finally done!*

Our drawers have been tested and they have shown excellent performance so far. We went on to finish the project and modify it for better and easier usage.

**Smart Drawers**
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