

Digimeter

WORK BREAKDOWN STRUCTURE

1.0 UNDERSTANDING THE SYSTEM

1.1 What to Understand

- 1.1.1 How are we going to measure distance?
- 1.1.2 How and where do we display that measurement?
- 1.1.3 How do we perform the associated function – beep (when measurement is completed)
- 1.1.4 How do we wirelessly integrate the device with the display?

1.2 How to Understand

- 1.2.1 Discussing our idea with electronic technicians, mentors, peers and seniors.
- 1.2.2 Researching about our project through web-surfing and videos
- 1.2.3 Finding gadgets that have similar functionality

2.0 PREPARING DESIGN

2.1 Basic Layout

- 2.1.1 Drawing the circuit
- 2.1.2 Understanding working of the circuits
- 2.1.3 Analyzing the placement of components

2.2 Identify the required components

- 2.2.1 For measuring lengths: Wheel Encoder
- 2.2.2 Microprocessor: Arduino Nano
- 2.2.3 Wirelessly connecting the device and display: Bluetooth Module
- 2.2.4 To mark-out length: Buzzer

2.3 Acquiring the Skills

- 2.3.1 C programming for Arduino
- 2.3.2 Java for Android App Development

2.4 Procurement of Components

- 2.4.1 Research about availability of components
- 2.4.2 Procure standard components online
- 2.4.3 Go to the market
 - 2.4.3.1 Exploring various alternative options of components
 - 2.4.3.2 Finalizing the best quality product
 - 2.4.3.3 Purchasing the product

3.0 PROJECT DESIGN

3.1 Digimeter Design

- 3.1.1 Choose a suitable body for the device
- 3.1.2 Attach the wheel encoder to the body and connect it to the Arduino
- 3.1.3 Connect the Bluetooth Module to the Arduino
- 3.1.4 Connect a Buzzer to the Arduino
- 3.1.5 Assemble the components in an organised manner

3.2 Developing the App and Incorporating Desired Features

- 3.2.1 Measuring area and volume
- 3.2.2 Options for units

3.3 Coding the Arduino

- 3.3.1 Transfer the received data via Bluetooth Module to the App
- 3.3.2 Cause the buzzer to produce a sound

3.4 Integrating the System

- 3.4.1 Combining all units as a whole
- 3.4.2 Ensuring the compatibility of hardware and software
- 3.4.3 Checking the performance of the device

4.0 TESTING AND CALIBRATION

4.1 Perform the following tests

- 4.1.1 Move the *Digimeter* along a range of lengths
- 4.1.2 Move the *Digimeter* along different types of surfaces
- 4.1.3 Try displaying areas and volumes of different types of objects
- 4.1.4 Try displaying the results in various units
- 4.1.5 Test the working range of the Bluetooth Module
- 4.1.6 Test the working of the buzzer

4.2 Make corresponding implementations of the required changes

5.0 REVIEW AND FINALIZATION