Open Source Low Cost Ventilators

By Shankaraditya N S

Shankaraditya N S

Student at:

Sri Venkateshwara College of Engineering

Dept. of Electronics and Communication

USN: 1VE18EC085

Key Components of Ventilator System

- Open Source, Easy to Deploy Ventilator
- IOT Devices
- Mobile App - For Doctors and other medical officers
- Mobile App - For patient and their respective family

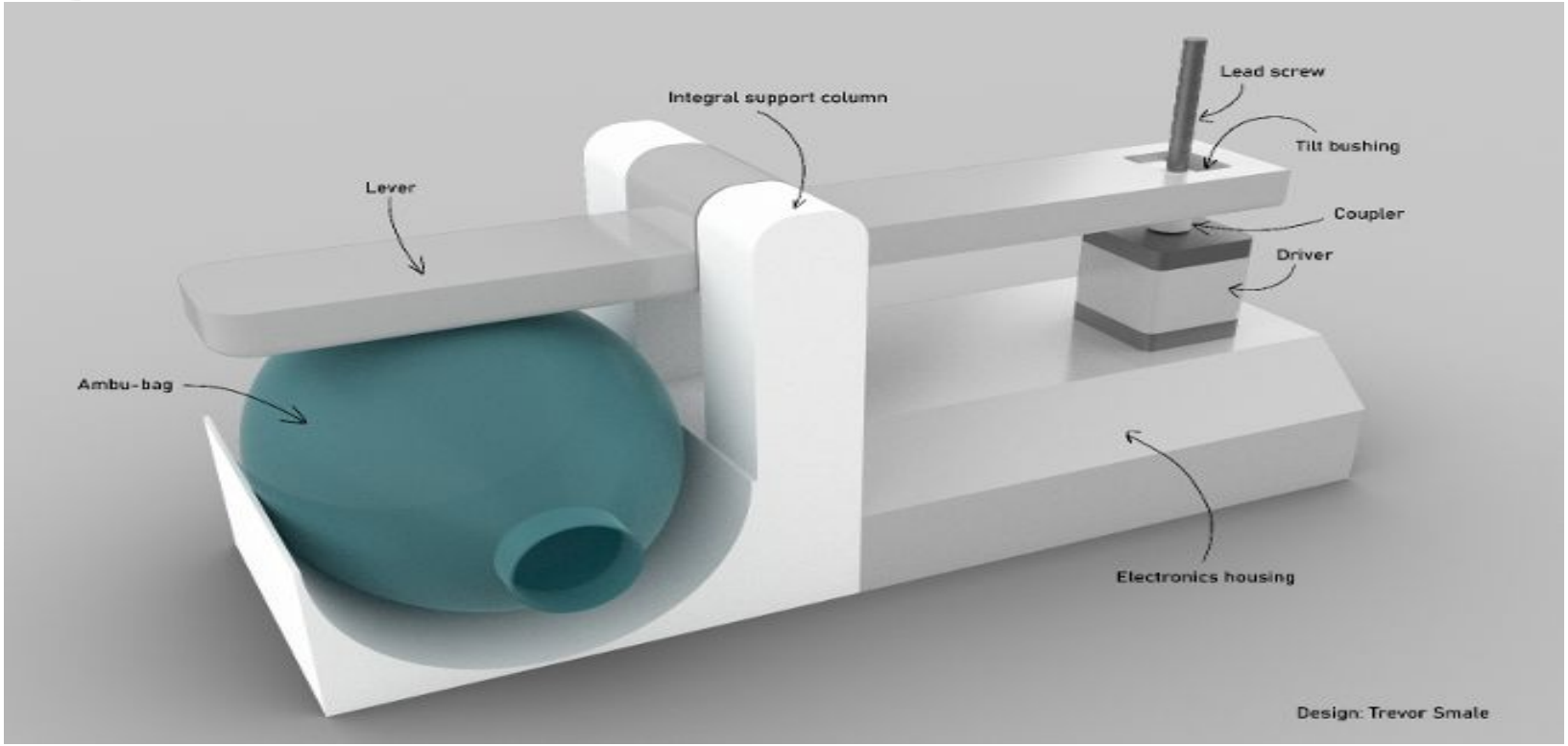
Ventilator Design

We will attempt to build a quick deployment ventilator that utilizes a Bag Valve Mask(BVM), also known as an Ambu-bag, as a core component. Ambu-bags are mass-produced,certified,small, mechanically simple and adaptable to both invasive tubing and masks. It will sense and control air pressure and flow with the goal to enable semi-autonomous operation.

Success Criteria

- Device must be easy to mass-produce
- Components must be certified
- The mechanical design must be small and simple
- Previous research and testing in Ambu-Bag must be used

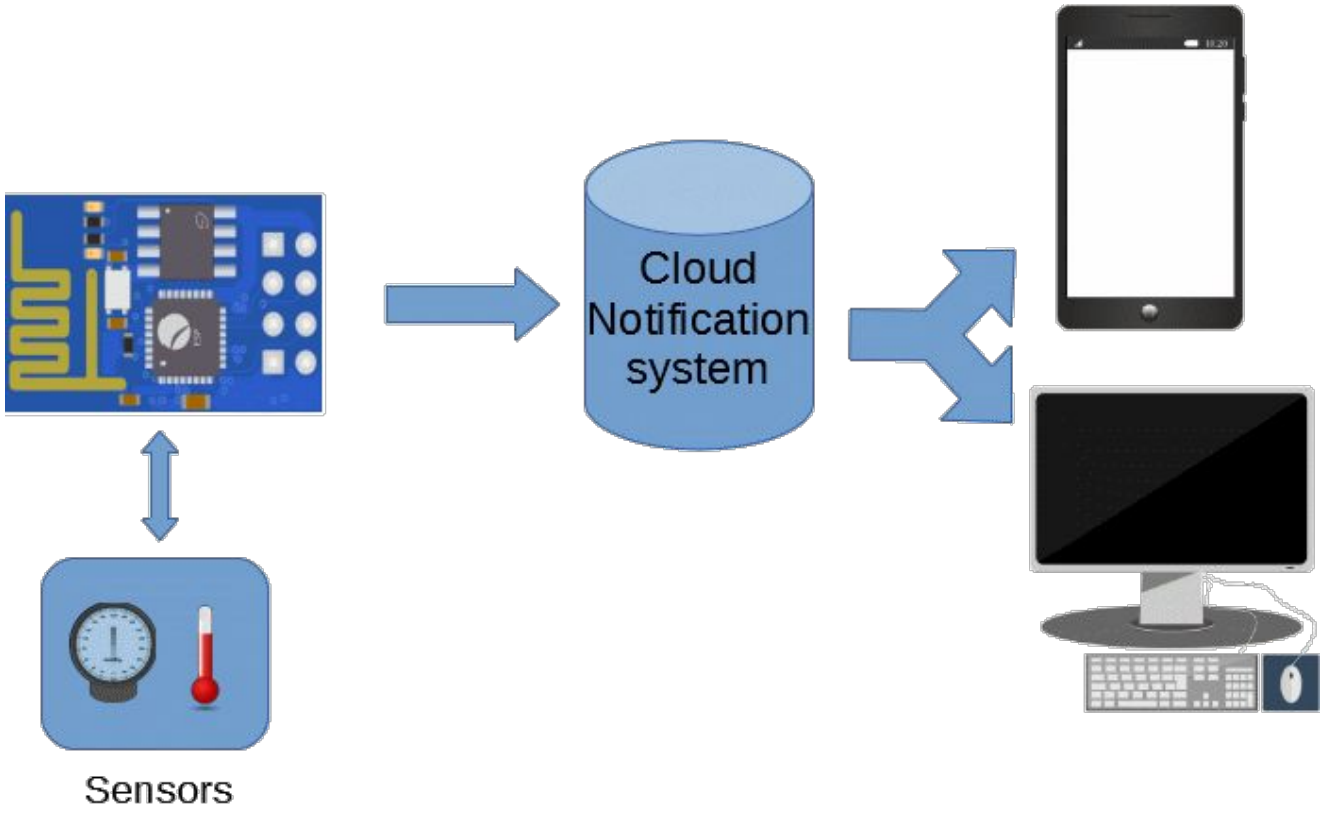
Illustration of Ventilator



IOT Devices

- We use them to send critical data like breathing rate, heart-beat rate etc to the cloud.
- Sensors are used to obtain data after which open-source components like ESP32 or ESP8266 are used to send data to cloud.
- Our Apps then access these data to assist the doctors, nurses and other medical officers.

Illustration of IOT devices



Mobile App

- We will build our apps on Flutter which is an open-source cross-platform app development software(Apps for both Android and ios).
- Will take important data like breathing, heart-rate etc from the cloud.
- The first app will help doctors take further steps to stop the infection.
- The second app will help the patient or their family get a better understanding of their condition.

Illustration of Flutter Apps

Conclusion

Building this ventilator system will help the patients, doctors and other stakeholders immensely. Timely help will be provided to the patients which is of the utmost importance.