

## IOT PROJECT

### Ultrasonic

- An ultrasonic sensor uses sound waves we can't hear to measure distance or detect objects. It will send out waves, and when they bounce back from an object, the sensor will calculate how far away it is.
- Within my Smart Fan project, the ultrasonic serves for human presence detection. It will emit ultrasonic waves and will analyse the returning signals, this way it can sense when a person enters the room

The clever part it is designed to ignore signals bouncing off small animals like pets, ensuring it only responds to human presence only for a tailored and energy-efficient cooling experience

### Comparing sensors :

#### Ultrasonic :

- Strengths : Excellent at detecting human presence accurately. Can be programmed not to pick up smaller movements like pets/non-human movements
- How it fits into Smart Fan Project : ideal for making sure fan kicks in when senses people, creating a personalised and efficient cooling experience

#### Infrared sensor :

- Strengths : good for detecting heat signatures, including humans. Commonly used for motion detection
- Weakness : Can be triggered by pets or heat-emitting objects, leading to false activation
- How fits into Smart Fan project : Might result in occasional unwanted fan activations due to sensitivity to heat sources other than humans

### DHT11 Sensor

- The DHT11 sensor measures real-time temperature and humidity data, offering essential information for weather monitoring and indoor climate control..
- In the IOT project it will serve as a silent hero, constantly measuring temperature and humidity. The data will become the fan's secret weapon, allowing it to adapt to comfort needs. Essentially the DHT11 turns the fan into a smart, responsive cooling system tailored to the room's specific conditions.

DHT11 :

- Type : Temperature and Humidity
- Strength : Simple, affordable, and covers basic environmental monitoring needs
- Limitations : Accuracy might not be as high as more advanced sensors

DS18B20 (Temperature Sensor):

- Type : Digital temperature sensor
- Strengths : High accuracy, versatile, and works in various environments
- Limitations : primarily measures temperature, not humidity

Smart Fan Project :

- DHT11: It's an all in one package, covering both temperature and humidity aspects. Its simplicity aligns well with basic environmental monitoring, making it suitable for this project as detailed data isn't crucial
- DS18B20 : With chasing precision in temperature and sacrificing humidity data, only then will this sensor be a contender.

So choosing between the two sensors it was a no brainer

Think Ink Display

- Think of the Think Ink Display as a cool electronic paper screen. It's like a digital notepad, using e-ink for clear, it is easy on the eye to read. Great for displaying info to look good and last a long time on a single charge.
- In the Smart Fan project, the Think Ink display serves as a visual command centre. It showcases real time data, presenting the distance in inches/ cm alongside current temperature and humidity readings. It's essentially a compact yet powerful information dashboard, giving an insight into the surroundings with a glance.

Motored Fan

- A small motored fan will be used as a breeze buddy. It is very compact and handy, great for keeping things cool in small areas.
- The IOT Smart Fan is like a tiny genius in cooling. It senses the room, adjusts the speed based on temperature and humidity, and even will know when humans are around. The Thinkink Display quickly shows the required details. It's like having a smart breeze that keeps the user comfy effortlessly.

Blynk App

- The Blynk app is a remote control for the IoT world. It lets you easily monitor, and control connected devices from your smartphone. With a simple interface, can toggle settings, check real-time data and stay connected to smart gadgets wherever you are. It's a convenience a your fingertips.
- Blynk App becomes the wizard behind the scene for the Smart Fan project, with a sleek interface on the phone displaying real-time temperature and humidity for the fan. It's not just a control panel, but an indoor weather system in your pocket. The best part is it connects to Wi-Fi, ensuring reliable access from anywhere. Managing the fan's settings has been the convenient and connected.

#### MQTT (DIDN'T ADD TO PROJECT)

- MQTT is a lightweight talk between devices, helping them share information with minimal fuss. Perfect for IoT setups where every bit of bandwidth and energy counts
- MQTT was meant to be the project's backstage silent talker, allowing Smart Fan to share temperature and humidity effortlessly. However, when facing connectivity issues, I couldn't add it to my final project

#### Comparing Connectivity

Blynk :

Strengths:

- User friendly, offers a straightforward and user-friendly interface, making it easy for anyone to control
- Widgets galore : Blynk provides a variety of widgets for creating customised and visually appealing experience

Weakness:

- Cloud dependency : blink relies on cloud-based service, which may raise concerns about privacy and dependency on an external server

MQTT:

Strength :

- Flexibility : MQTT is a versatile messaging protocol that can handle a wide range of devices and scenarios

Limitations:

- Learning curve : Integrating MQTT can be more complex, especially those new to messaging protocols

#### Smart Fan Project

- Blynk : With a quick set up, visually appealing interface, the Blynk App is the go to. With the polished app that brings a user-friendly experience to your fingertips
- MQTT : If aiming for a more flexible and open ended communication system, MQTT could be the other option, all depending on the user experiences.

## Conclusion

- To sum it up, the Smart Fan project will be a game changer. Using sensors like ultrasonic and DHT11, it adapts to the surroundings for optimal comfort. The Think Ink display and Blynk app provide real-time data and easy control
- What makes this project special? Energy efficiency, by adjusting the speed based on environment, it cools smartly. Despite occasional connectivity blips, troubleshooting keeps the info flowing
- For users, the Blynk app makes customisation a breeze. Making it not just a fan, but a personalised comfort station. In short, the Smart Fan isn't just about cooling – it's the future of smart, efficient fans designed just for you

### What went well :

Functionality : with the ultrasonic sensor it did its job with only being able to pick up human presence and not animals. Meanwhile with the DHT11 being able to pick up temperature and humidity allowed it easier to display this information with the user.

Innovation : with using the Blynk App it's like a personal manager in the pocket, allowing users to check and control temperature and humidity remotely, it's not just about turning the fan off and on, it's about giving the users power

Reliability : With the Smart Fan being a trusty sidekick always by your side, the sensors and the Blynk App work harmoniously, delivering consistent performance.

### What didn't go well :

MQTT : Within this project I had a few hiccups in the road, with the MQTT connection deciding to play hide and seek with the ESP32, causing a digital standoff.

FAN: Also having some wiring issues with the Fan itself, leading to unexpected annoyance instead of it being a smooth breeze. However this stuff happens, tech has its own quirky days.

DHT11 : With my DHT11 sensor not working for a long period of time due to connectivity issues and leading to myself going into panic mode, resulting in me initially thinking it was my Blynk App playing up, making me question its reliability, but it was DHT11 being loose on the breadboard with its jumper wires





