

# MQTT BASED SMART HUSBANDRY MONITORING FRAMEWORK WITH LIVE SURVILLANCE

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## **ABSTRACT:**

*This paper is lined up with smart husbandry monitoring framework with live surveillance using MQTT. In this paper the focus is to keep track of the animals in the farm by monitoring the shed temperature level, water level which comes with a remote control. For the farm monitoring an IOT module is developed using embedded technology. The microcontroller is connected with temperature sensor, waterlevelsensor, PHsensor, ultrasonic sensor to know the accurate values and to change them accordingly. The doors and the lights can be operated using the remote control in this paper which make the shed more secured. The camera used the shed will be ESP32 WIFI camera for the vision. The software tool used Arduino IDE and the programming language used will be Embedded C.*

**Keywords:** IOTmodule, EmbeddedC, Temperature sensor, waterlevel sensor, Arduino IDE, ESP32 WIFI camera.

## **1. INTRODUCTION**

Agriculture is considered as the back bone of India. The main source of income to the farmer is from the cattle. As the modern farming says that if the cattle is monitored under optimal conditions their growth and production will be very high when compared to the normal methods. The cattle are generally prevented from searching their own food and so the requirements of the cattle should be managed by the farmer and he has to be responsible for taking care in all the aspects of his husbandry. So the supervising of cattle involves feeding, growth, health and the farmer cannot monitor them lively all the day. So this paper MQTT based smart husbandry monitoring framework comes into place. In this, the system is designed to monitor the cattle 24/7 and give the updates to the farmer through the application. The farmer can also monitor the shed as ESP32 WIFI camera is used. This system can monitor the water level, feed level, and temperature and humidity level of both shed and the animals. And also it can detect the smoke in the shed. The microcontroller is used to connect all the sensors and the IOT module is used to report the changes in the shed frequently to the farmer.

## **2. EXISTING SYSTEM**

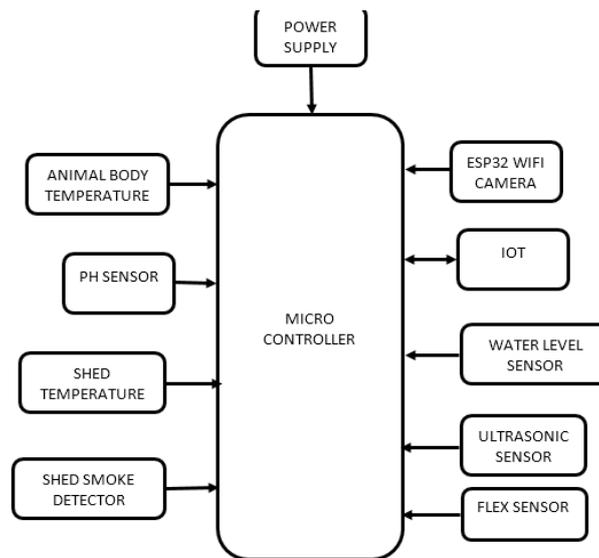
The existing system uses only a few sensors to monitor the shed .This system is not effective as it can only measure the temperature and humidity of the animal. As the cost of the system is high comparatively, the performance level is low. So the farmers cannot afford this existing system and they cannot monitor the

other things in animals which are equally important to monitor. And in the existed system the farmer can't predict the changes occurring in the shed environment.

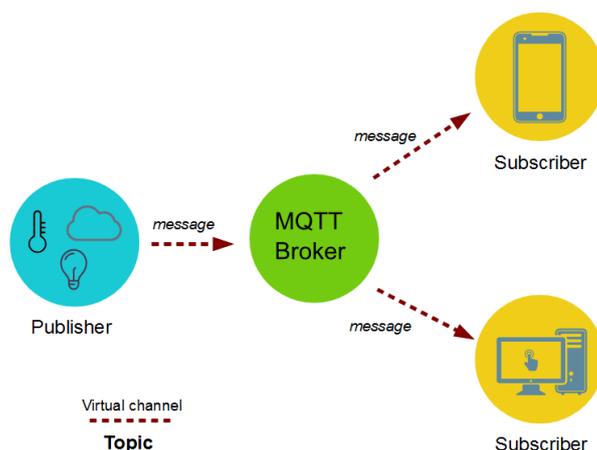
### 3. PROPOSED SYSTEM

In the proposed system the microcontroller is used which will be connected to the various sensors to monitor all the aspects in the shed and as well as the animals. This embedded module monitors water level, temperature, amount of feed to be given, smoke ,PH level .The reproduction and the lactation period of the cattle can also be monitored using the flex sensor. Through the internet of things (IOT) the data will be transmitted to the farmer through the application in the form notification. Not only monitoring the environment of animal and shed. We can also control the doors, lights, fans, taps, live camera can be operated using this IOT module. And in the proposed system we are using MQTT (Message queuing telemetry transport) for transporting the information from sensors to farmer. As there are many protocols to do this job but as compared to the other protocols MQTT gives best output. Some of the protocols are ZigBee, HTTP, AMQP, and COaP. MQTT makes the data delivery faster, and we can control it easily, they can get information from many sensors and can transmit data to many nodes. And the Cost of MQTT is less compared to other protocols. And so the farmer can afford this system and monitor all the details of the shed.

#### BLOCKDIAGRAM:



#### 4. MQTT PROCESS



MQTT process starts with publisher. Initially publisher starts to publish the data which is taken from the sensors. And the data is transferred to the MQTT Broker and then Broker transfers the data to the subscribed devices.

#### 5. PROPOSED METHODOLOGY

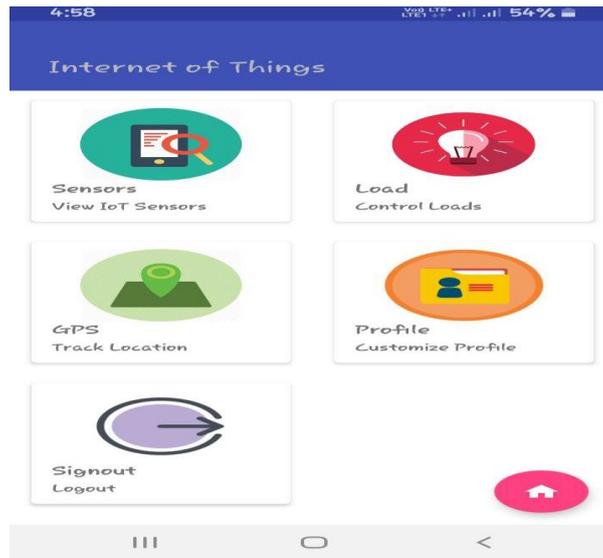
The DC voltage will be fed to the system after the voltage is regulated by a regulator IC, then the system turns on and all the sensor work gets started.

- i. The microcontroller controls all the sensors connected and it also controls the physical devices. And receives information from all the sensors.
- ii. The temperature sensor LM35 will detect the temperature.
- iii. The gas sensor MQ-8 is used to detect harmful gases in the shed or surrounding the animal.
- iv. The water level sensor monitors the water level that cattle have been consuming.
- v. The ultrasonic sensor senses the feed level for the animals in the shed.
- vi. The PH sensor senses the humidity in the shed.
- vii. The Flex sensor senses the reproduction changes and lactation period of the cattle.
- viii. The ESP32 WIFI camera will provide the live telecast of the shed.so that the shed can be monitored manually too.
- ix. The IOT module transfers the data from the microcontroller to the farmer.

#### 6. RESULT

In the result the farmer gets application through which he get live data from the shed and the animals. Farmer can control all the sensors using this application. Farmer can track the live location of the animals as shown below.

## APPLICATION ENVIRONMENT



### Control Loads



The farmer can add sensor or remove sensor connections. And also farmer can switch on or switch off the sensors using the application.

## 7. CONCLUSION

- i. MQTT is used to monitor the shed and the cattle continuously using various sensors and these sensors will be reporting about the temperature, humidity, water, feed, smoke, harmful gas detection, reproduction and lactation period of the cattle and also about the shed maintenance. Through this paper the farmer will be able monitor the shed wirelessly.
- ii. The system can be further implemented in the future by placing this entire system in the shed and controlling through the mobile phone. This system can always help the farmer to keep an eye on the cattle and shed environment.
- iii. The farmer can also detect any unauthorized movements in the shed using motion sensor. Using this sensor farmer can able to know any missing of cattle in the shed.
- iv. And also using Image processer farmer can able to know if any cattle is wounded.so the farmer gets notification if the cattle is wounded.

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