Interdisciplinary Project

ADVANCED RETAIL SYSTEM

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Sathyabama Institute Of Science and technology

Team members

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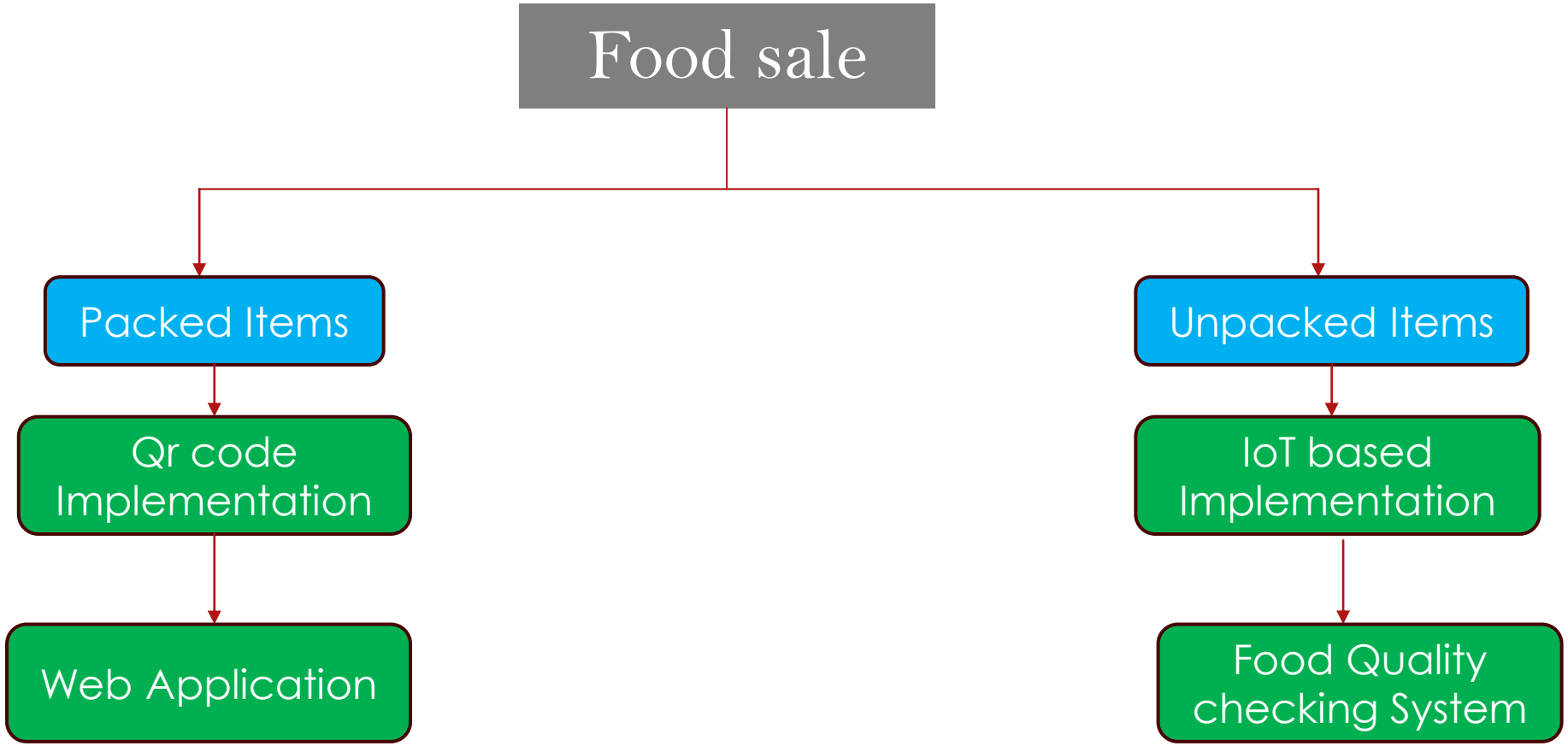
SCOPE

- Implementation of QR code technology for packaged food products.
- Development of an IoT-based food quality checking system for non-packaged items.
- Integration of QR code scanning functionality into retail point-of-sale systems.
- Testing and validation

OBJECTIVE

- To prevent the exchange of expired products by providing consumers with accurate information through QR code technology.
- To monitor and maintain the quality and freshness of non-packaged food items using IoT-based sensors.
- To improve consumer trust and confidence in the retail industry by ensuring product authenticity and freshness.

BLOCK DIAGRAM



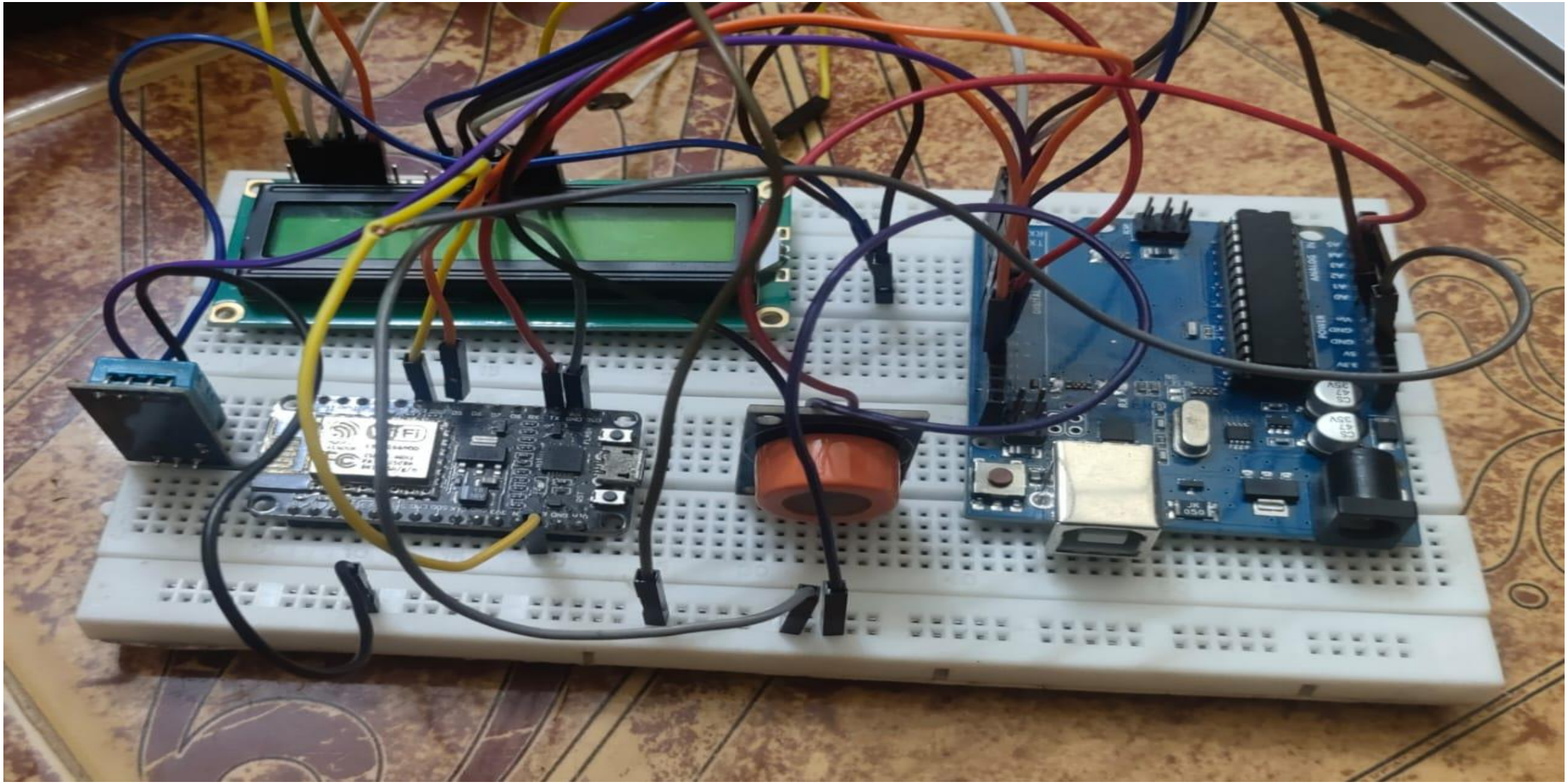


Fig 1: Circuit connections

METHODOLOGY

QR Code Technology Implementation:

- Develop a QR code generation system to encode product information such as expiration date, batch number, and origin.
- Integrate QR code scanning functionality into retail point-of-sale systems and mobile applications.
- Test the QR code system with various packaged food products to ensure accuracy and reliability

METHODOLOGY

IoT-Based Food Quality Checking System:

- Design and build IoT sensor nodes equipped with temperature, humidity, light intensity, and ethanol gas sensors.
- Develop a centralized data collection and analysis platform to monitor sensor data in real-time.
- Implement machine learning algorithms to analyze sensor data and detect deviations from acceptable quality standards.

Proposed Components

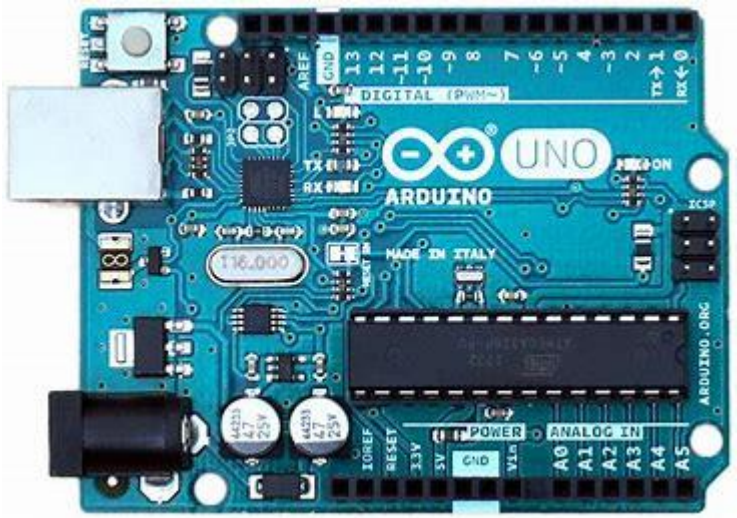


Fig2: Arduino uno

Fig3: Gas sensor

Fig4: LDR Sensor

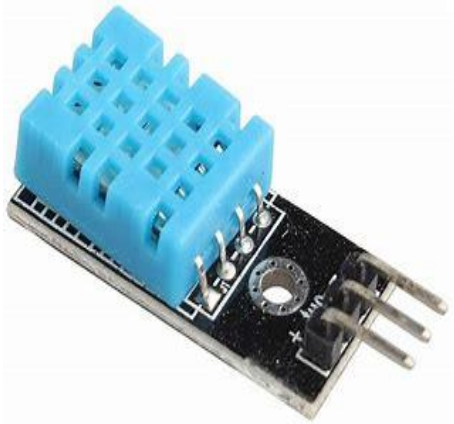


Fig5: DHT11 Sensor

Specifications of all the purchased components

Arduino UNO :

- The Arduino UNO is ATmega328 based Microcontroller board. It is one of the most popular prototyping boards. The board comes with built-in arduino boot loader.
- While programming the board, it can be connected to the PC using USB port and the board can runs on USB power. The Arduino UNO has 32 Kb Flash memory, 1 Kb EEPROM and 2 Kb SRAM.

Specifications of all the purchased components

MQ3 GAS SENSOR

- MQ3 alcohol sensor module is used to detect the presence of ethanol, where the sensitive material used for this sensor is SnO2, whose conductivity is lower in clean air.
- It's conductivity increases as the concentration of ethanol gases increases.
- It has high sensitivity to alcohol and has a good resistance to disturbances due to smoke, vapor and gasoline.

Specifications of all the purchased components

DHT11 SENSOR

- DHT-11 is a temperature and humidity sensor. The DHT11 sensor consists of two main components – one is Humidity sensing component and other is NTC temperature sensor (or Thermistor).
- The Thermistor is actually a variable resistor that changes its resistance with change in temperature.
- They both sense the temperature and humidity of area and give the output to the IC

Specifications of all the purchased components

LDR SENSOR :

The LDR is used to sense the intensity of light. The sensor is connected to the A1 pin of the Arduino board. The LDR provides an analog voltage which is converted to digital reading by the in-built ADC.

LCD DISPLAY :

The 16*2 LCD display is connected to the Arduino board by connecting its data pins to pins 2 to 5 of the Arduino board. The RS and E pins of the LCD are connected to pins 10 and 9 of the Arduino board respectively. The RW pin of the LCD is grounded.

Expected Output

Packed product

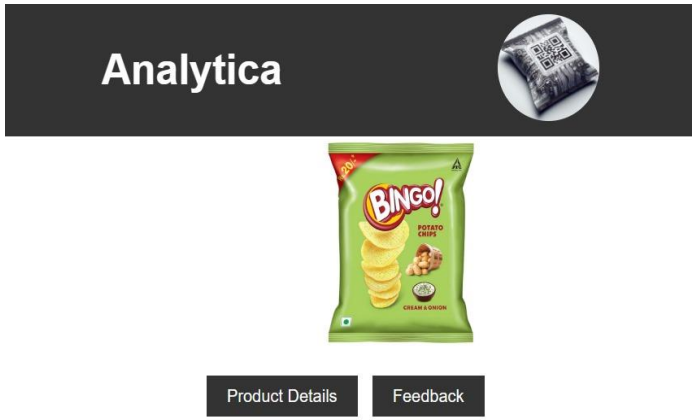


fig:6:Company page

Product Name

Bingo Cream and Onion

Date of Manufacture: January 1, 2023

Date of Expiry: September 23,2024

Unique Id:NEHA6382747414

About: made in india

Fig7:Product Details

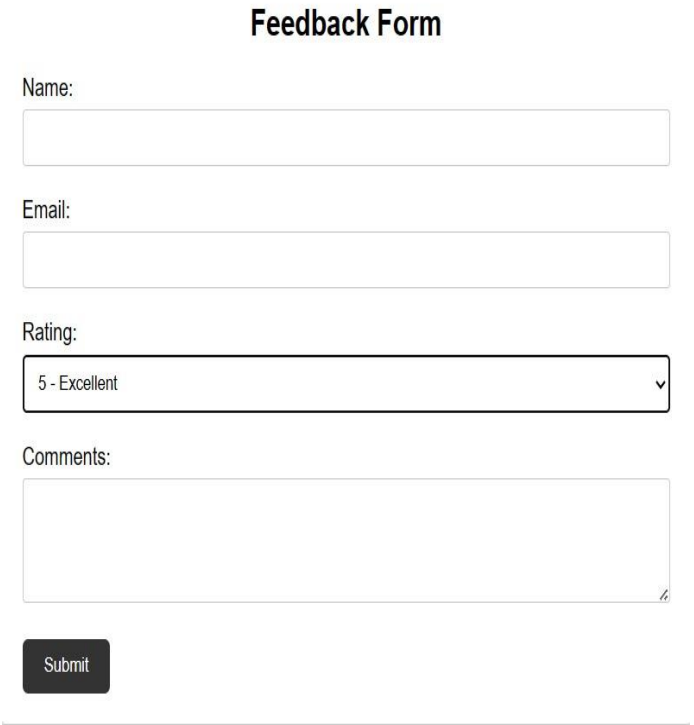


Fig 8: Feedback Form

Expected Output

Unpacked product

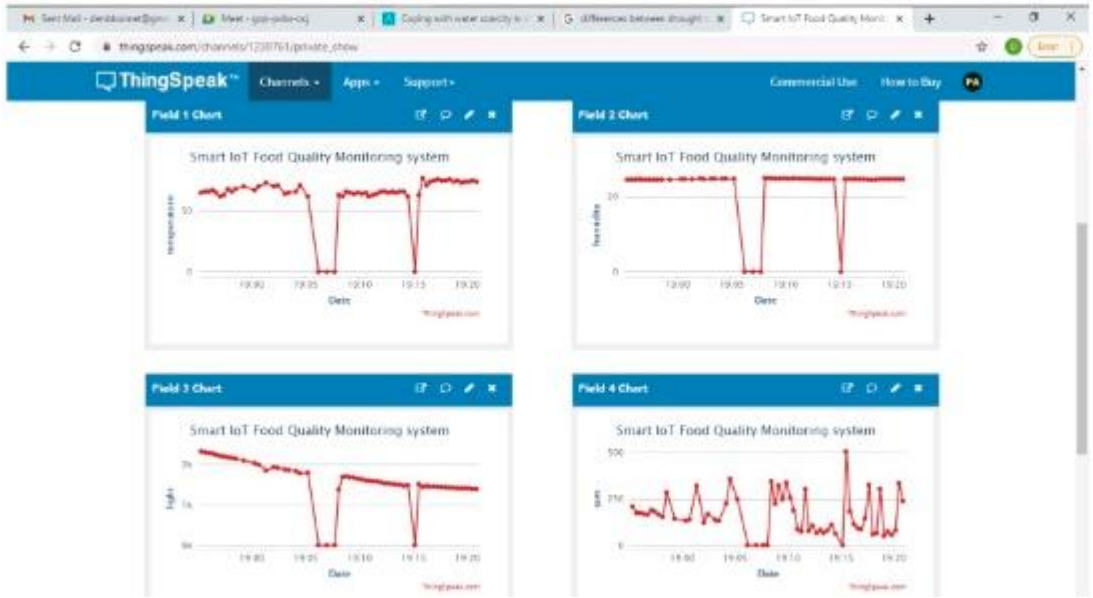


Fig 9: Unpacked products in thingSpeak


Thank
You!