Department of Electrical and Computer Engineering

Design of Cattle Health Monitoring System using Wireless Sensor Networks

Supervisor: **Dr. M Iqbal**

Group members:
- Muhammad Aitesam
- Syed Fasih Aalian Shah
- M Taymoor Qadir

Introduction

- **Motivation**

   To increase the sustainability of the livestock industry, there has been an increased need for replacing traditional group-level management with precision livestock farming, which continuously monitors and manages individual productivity and health issues.

   .

Introduction

- **Objectives**

  - Design & Deploy Low power, Low cost, sensor nodes on cattle body areas.
  - Create Wireless Sensor Network to connect all nodes to an Access Point
  - Read data and reliably transmit it to Cloud Database using Wi-Fi
  - Create Web User Interface to Visualize Data

Investigation

► ## Literature review

Cattle farming recently has started getting attention and many researchers have published their work in this regard.

The development methodologies from research articles are taken into account and their conclusions are used to simplify the design approach. Especially in terms of their selected hardware type and software protocols.

Articles:

► **Wireless Sensor Network Based Health Monitoring System for Cattle** Sweta Jha Divya Sharma Manoj Mishra Barnana Dutta Assistant Professor (EXTC) ISSN: 2278-0181

► **Cattle health monitoring system using wireless sensor network: a survey from innovation perspective** Bhisham Sharma1, Deepika Koundal 1
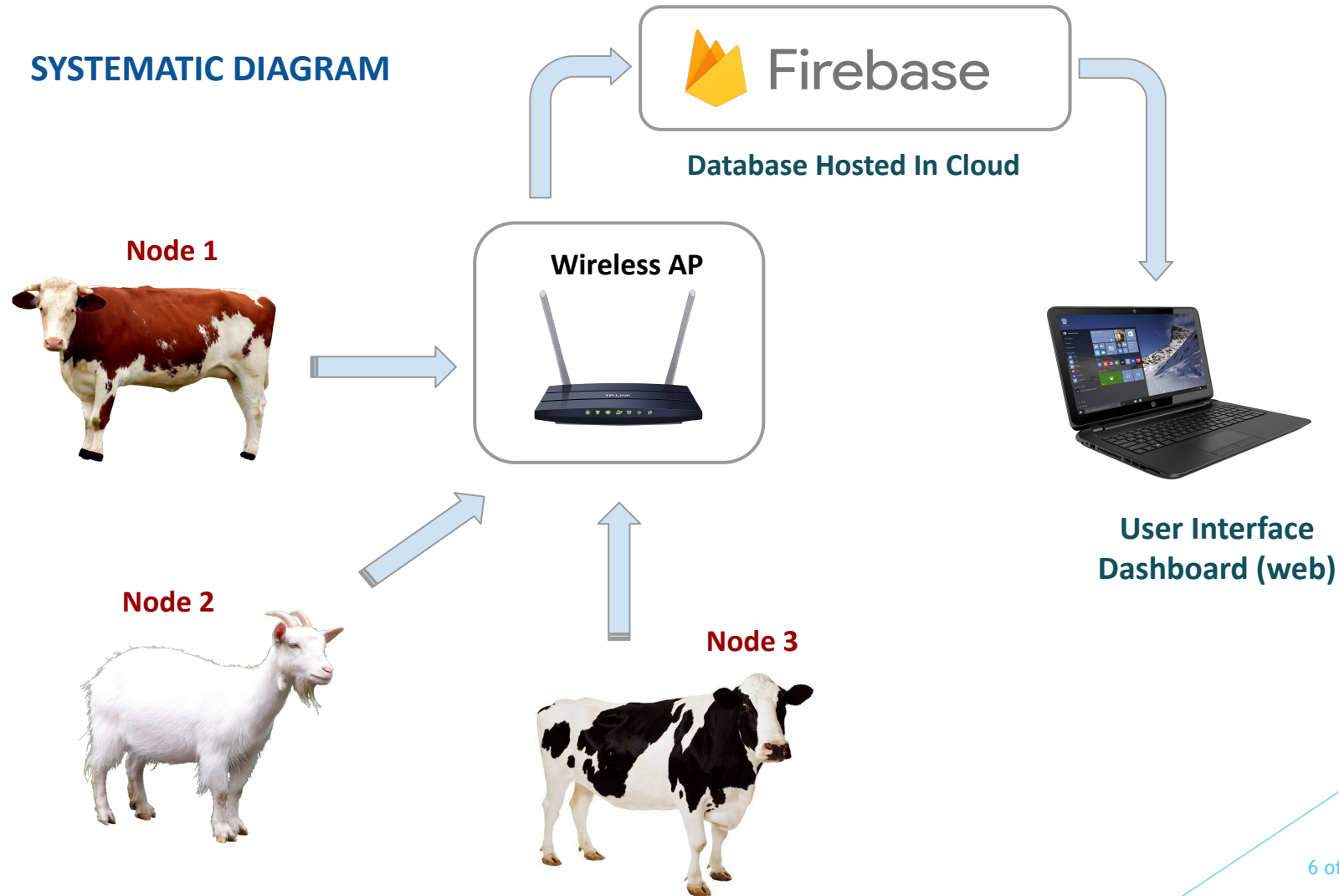
Investigation
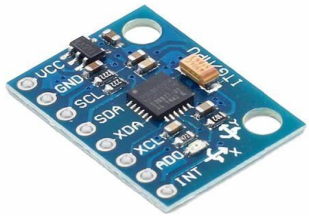
► **Existing Products & Their Drawbacks**

Solution Development - Proposed Framework

SYSTEMATIC DIAGRAM

Database Hosted In Cloud

Node 1

Wireless AP

Node 2

Node 3

User Interface Dashboard (web)

Solution Development - Proposed Framework

HARDWARE LEVEL DIAGRAM

DHT11: For Environment Temperature Sensing
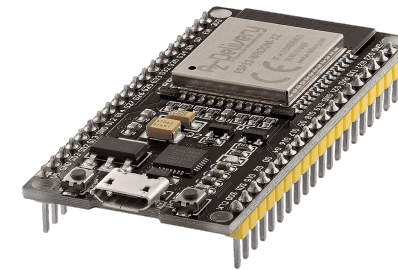
ESP32: Wireless Client (WiFi)

MPU6050: 3-Axis Accelerometer
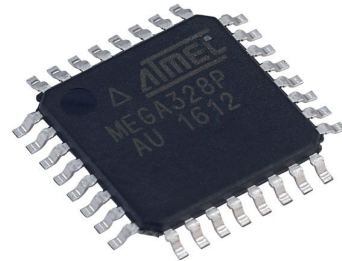
ATmega328p MCU: ATMEL,AVR Microcontroller with GPIO, I2C, UART & SPI

MQ135: Gas sensor; CO2, Smoke, Alcohol, NH3 Detector
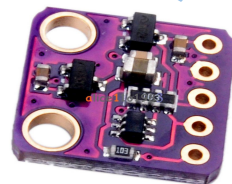
MAX30102: Heart Rate and Blood Oxidation level Sensor
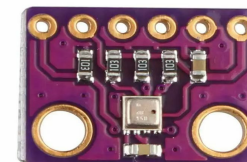
BME280: For Cattle Body Temperature Sensing

Project Management

► **Individual Contribution**

Contribution/Student	Muhammad Aitesam	Syed Fasih Aalian	Taymoor Qadir
Gathering Information	✔	✔	
Sourcing H/W & Supplies		✔	✔
H/W Design and Programming	✔	✔	
User Dashboard	✔		✔
Deploying Hardware	✔	✔	✔
Documentation		✔	✔
Maintaining Resources & Documentation	✔	✔	✔

Project Management

► **Project Timeline**

Collecting Information	→	Finalize Components, Protocols & Database	→	Schematic Design
October 15		**November 17**		**December 10**

Final Testing	←	Web UI Dashboard Design	←	Firmware & Programming
March 05		**February 15**		**January 30**

Deploying HW on Farm	→	Preparing Documentation	→	Maintain Project Resources
March 20		**March 30**		**April 10**
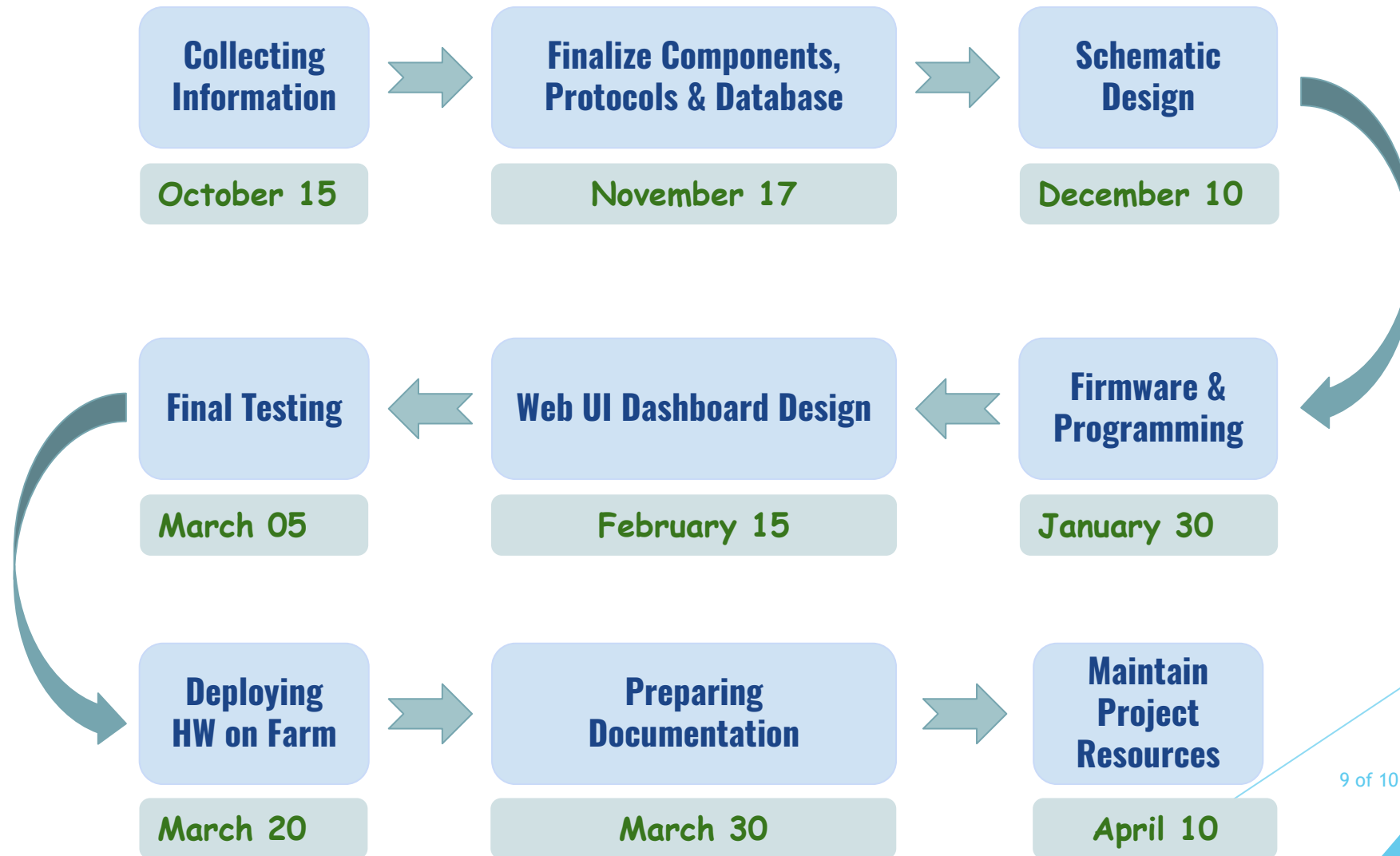
Conclusion – Impact on Society

- **Targeted United Nations SDG:**
  - Ensure sustainable consumption and production patterns (12)
  - Protect, restore and promote sustainable use of terrestrial ecosystems (15).
- Helping Small and Large scale Farms with keeping their livestock healthy and reducing percentage of life losses.
- Improving Yields and profits for small scale farmers by taking better care of their Cattle.
- Serving Livestock industry of Pakistan and Improving Agricultural Economy of the country

----

Thank You…