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# IoT Solution for early Mastitis detection

Bakaraty

Best Team

Abir Elbouziri - Houcem Korbi - Omar Letaief

# Mistatis : Problem identification

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- Mastitis is the primary cause of death by 79% of cows death
- Classic mastitis diagnosis is done by a manually test by farmer once every 3 months
- If the disease is lately diagnostics, the treatments will be probably not very effective to cure the case

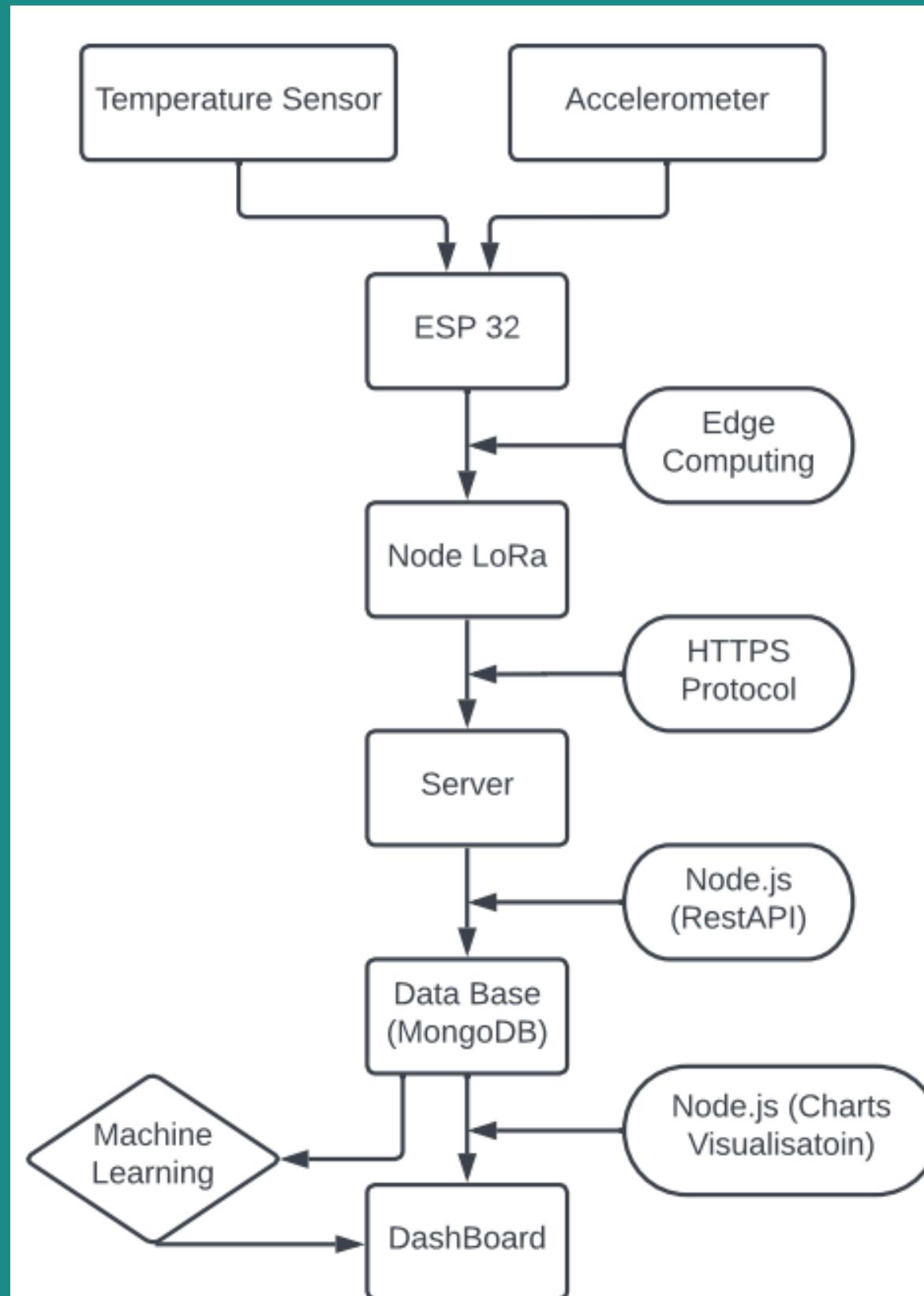
# Our Solution

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We developed an IoT based solution and machine learning algorithm to detect Mastitis disease in early-stage by collecting data like temperature and motion tracking.



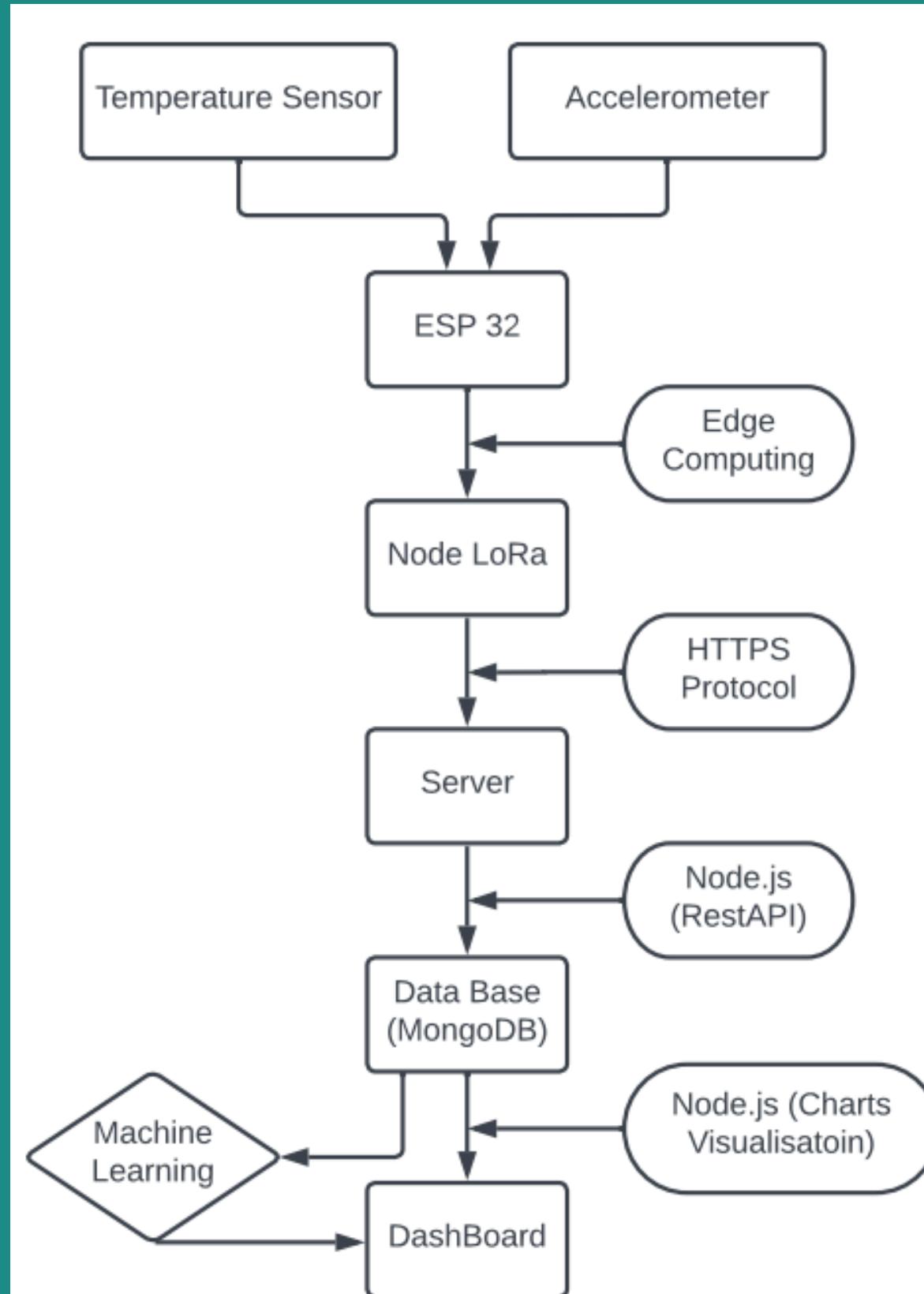
# Descriptive system flowchart



The system uses the latest technologies to ensure the best way of working with data.

Thanks to its flexibility, easy implementation and full cloud supporting system, **MongoDB** represents the perfect match for our IoT application.

# Descriptive system flowchart

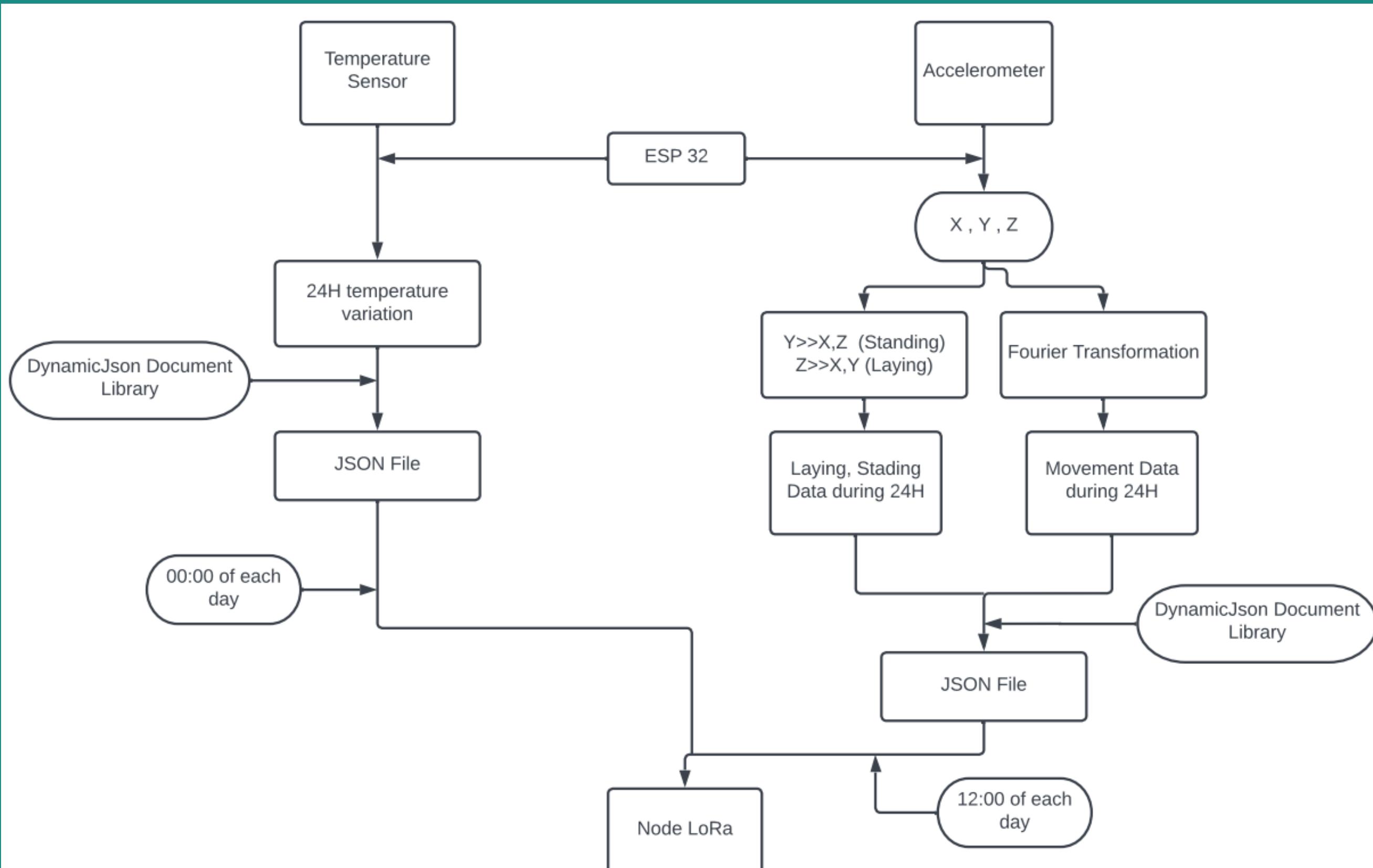


In the edge computing we provide a very optimistic algorithm that will allow us to track and analyse the data of all the day with **only 2 single transmissions** per day.

## Optimisation in :

- Lora utilisation, just 400bytes at maximum will be transmitted every transmission
- Energy optimisation

# Edge computing



# Machine learning

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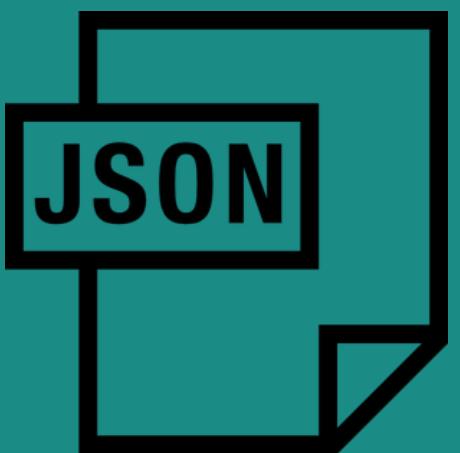
In our application we will use the **Artificial Neural Network (ANN)** classification algorithm, and it's used when there's a need to understand complexe relationships, between inputs and outputs

**Inputs :** - an all day long temperature values of the cow  
- movement tracking data (stading, laying, moving)

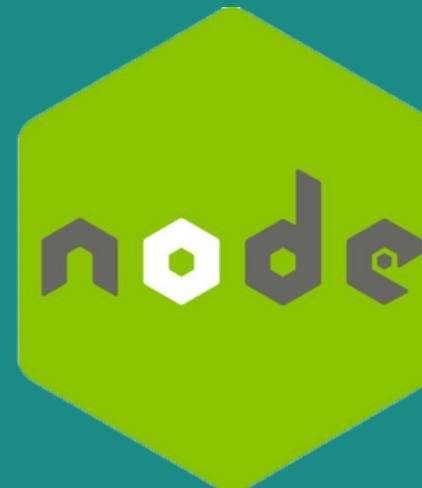
**Outputs :** - the health state of each cow and an alert if a cow has diagnosed with mastitis

# Used technologies for the Software part

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mongoDB



# Dashboard

The screenshot shows a dashboard interface with a dark header bar. On the left is a cow icon, followed by the Arabic text "الصفحة الرئيسية" and a house icon. On the right are icons for a crescent moon, a user profile, and a camera. Below the header, there are five cards, each containing a photo of a cow and its name in blue text:

- البقرة 1**  
احترس يمكن أن تكون البقرة مريضة
- البقرة 2**  
احترس هذه البقرة في حالة سكون غريب هي لم تتحرك ليوم كامل
- البقرة 3**  
أنت محظوظ هذه بقرة بألف بقرة
- البقرة 4**  
البقرة سليمة معافات
- البقرة 4**  
البقرة أصبح من الجن
- البقرة 5**  
البقرة في حالة جيدة

At the bottom of the dashboard, there are three small thumbnail images of cows and a message from Microsoft: "Activate Windows Go to Settings to activate Windows."

this is a friendly user interface which is characterized by its high capability to be easily adopted by common farmers. It provides a list of every single cow using our product showing their detailed daily info after being analyzed by machine learning ai algorithm

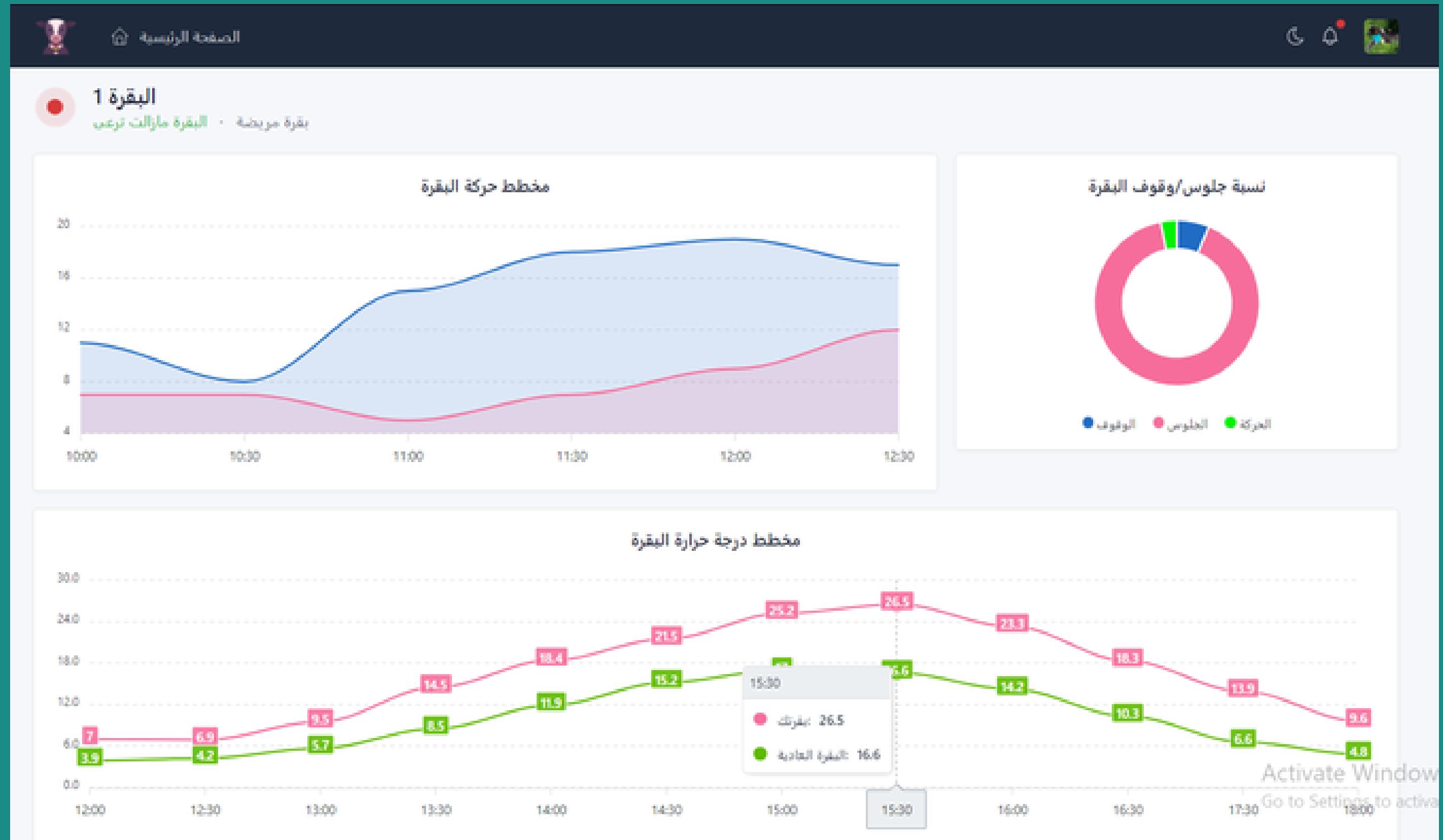
# Dashboard

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The image shows a mobile application interface with a dark header bar at the top containing icons for moon, bell, and user profile. Below the header, the title "اخر المستجدات" (Latest Updates) is displayed. A vertical list of four items follows, each consisting of a colored dot (red, black, black, green), the text "البقرة 1" through "البقرة 4", and a small thumbnail image of a cow.

- البقرة 1
- البقرة 2
- البقرة 3
- البقرة 4

# Dashboard



# Hardware materials

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ESP32 Development Board WiFi plus Bluetooth Dual Core CP2104

**Price :** 35.900 Dt

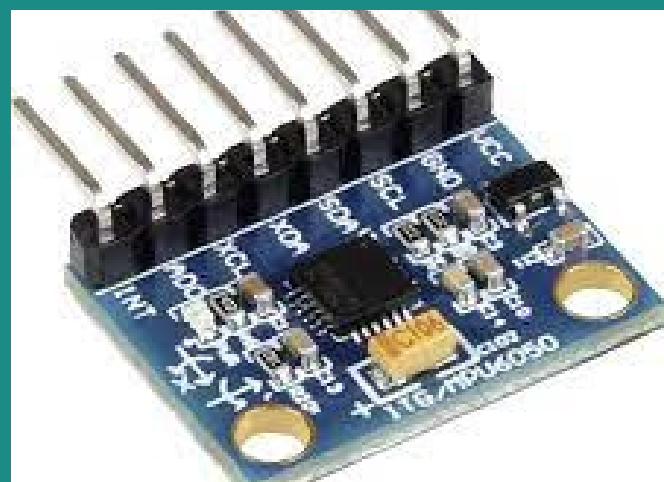
**Source :** <https://tuni-smart-innovation.com>



DS18B20 Stainless Temperature Probe

**Price :** 8.000 Dt

**Source :** <https://tuni-smart-innovation.com>



MPU6050-3 Axis Accelerometer Gyroscope Module

**Price :** 35.900 Dt

**Source :** <https://tuni-smart-innovation.com>