Automatic Pet Feeder

by Team SLEY

Meet The Team

Shehab Ahmed

Luc Suzuki

Erin Ng

Yara Idris

Stakeholders

1

Pets (End-user)

Examples: Dogs, Cats, Hamsters

2

Pet Owners (Community)

3

Online Retailers

Examples: Amazon, Walmart, Costco, Any Pet Food Supplier

4

Pet Care

Examples: Animal Shelters, Pet Hotels, Vets

Pain/ Problem

?

Pet owners/ Large Pet care facilities face following challenges:

- Ensure pets are fed on time
- Managing different food types (cat, dog, etc.)

Current manual feeders or basic automated ones are:

- Not versatile
- Cannot differentiate different foods
- Lack cloud-based features ensuring feeder is always stocked

Opportunity

Automation and **remote management** is enabled by IoT by connecting the feeder to the internet.

Sensors detect and identify the pet's presence. Ensuring **accurate** and **efficient** feeding.

IoT technology facilitates the ordering of the pet food through cloud integration. Resulting in a **reduction** in **food waste**

Needs and Constraints

Needs

- Technological integration
- Control and customization
- Safety and hygiene
- Advanced monitoring

Constraints

- Technical limitations
- Security Risks
- Behavioral issues
- Cost constraint

Current Solution

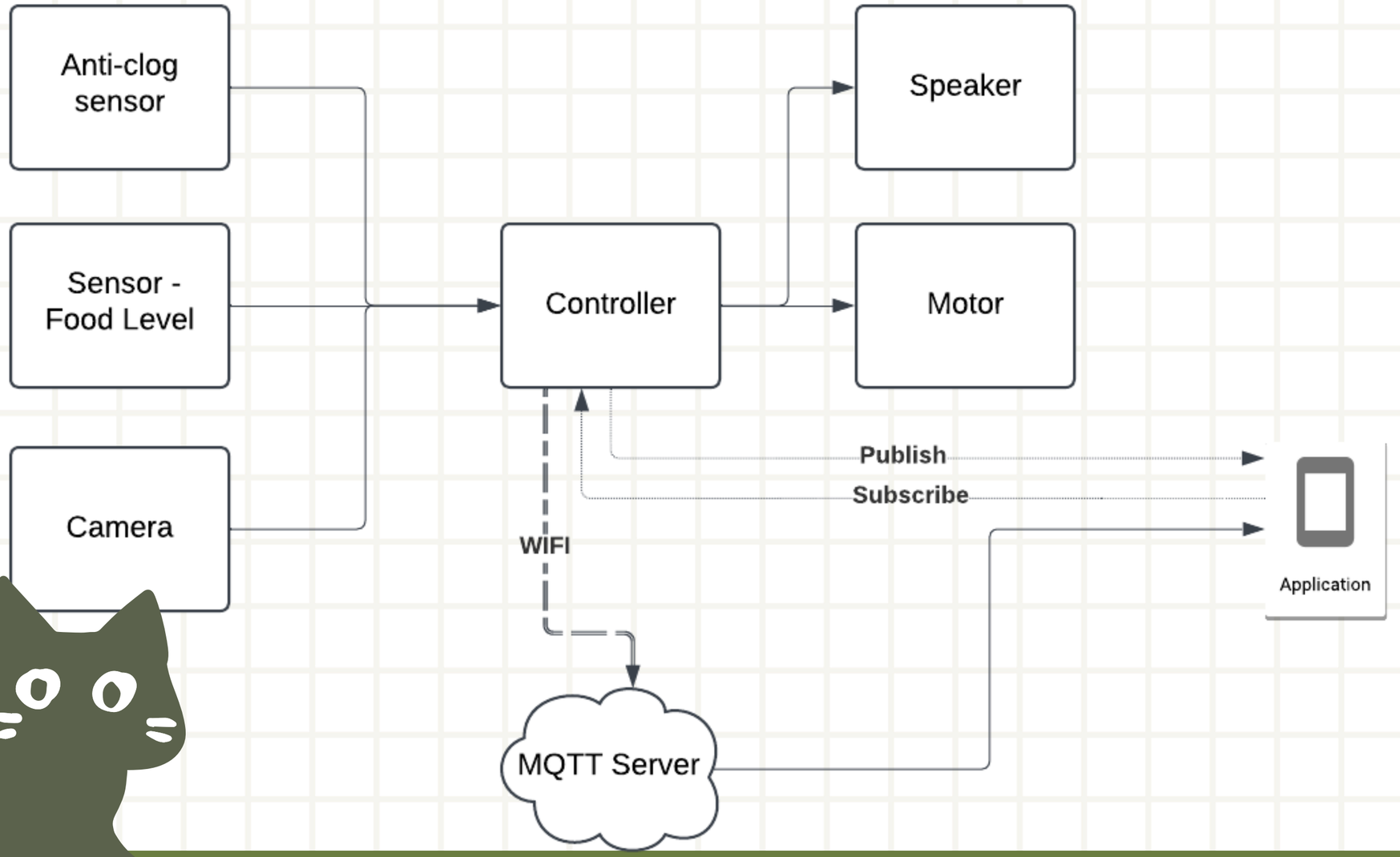
Current Solution

- Portion Management + Meal Scheduling
- Pet Monitoring
- Usage History
- Application Software

Shortfalls

- Only dispenses food
- Only dispenses one type of food
- Manually purchase food to restock
- Costly

Current Solution Block Diagram



Our Solution

Animal Recognition

- Using AI image recognition multiple pets can access their food on a timely basis
- dispense their respective foods – which can be customized

Remote Feeding

- Using an MQTT protocol users can dispense food manually or in a timed fashion
- Emergency stop to terminate dispensing

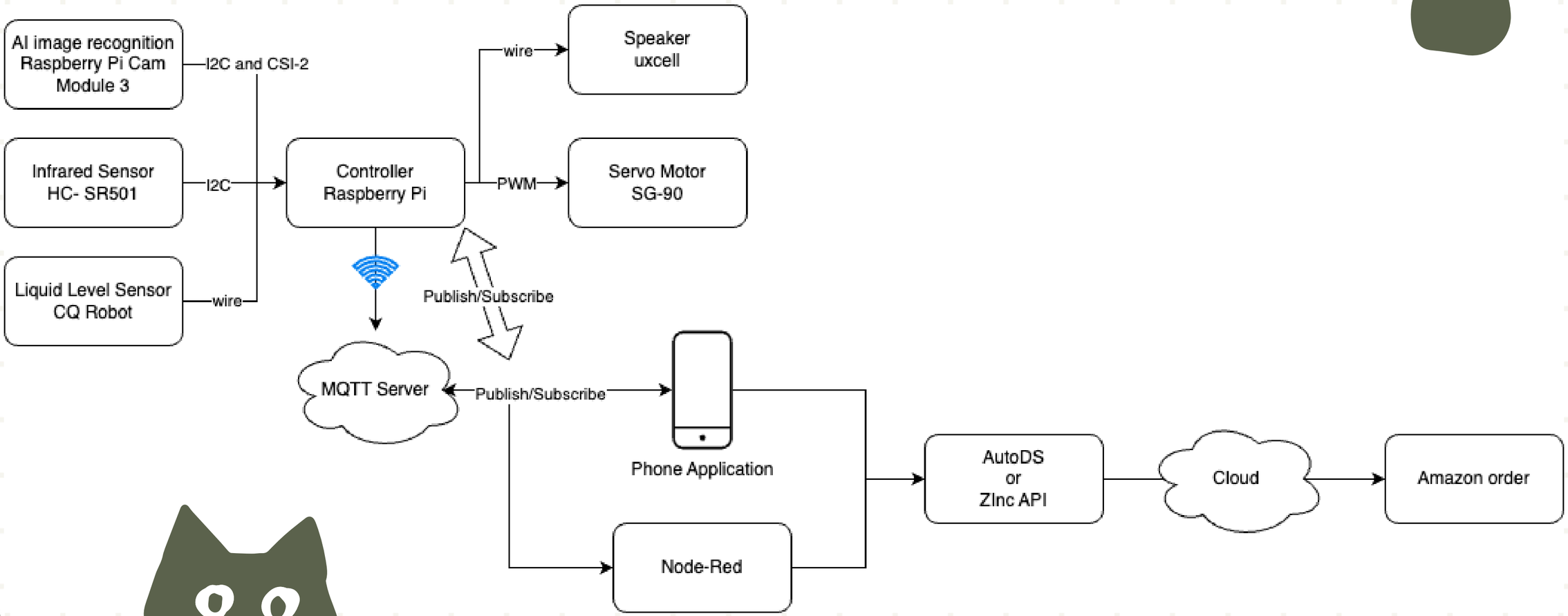
Inventory Management

- level sensors will be used to monitor the food left in the reserve
- Restocking through Amazon can be customized to ensure food is always available

Overcoming the shortfalls

- Cloud integration ensures timely restocking.
- Feeds more than one pet
- Dispenses food and water
- Cost effective

Block Diagram



Budget

Component	Quantity	Cost	Total
Raspberry Pi	1	$84	$164
Vision Camera	1	$25	
Infrared Sensor	1	$3	
Liquid Level Sensor	1	$21	
Servo Motor	1	$3	
Mini Speaker	1	$13	
3D Printed Casing	1	$15	

Value Creation

1

Customer Convenience

especially for busy or frequently traveling pet owners. With the ability to monitor and control the system, owners can control feeding through an app from anywhere and adjust schedules if plans change.

2

Reassurance

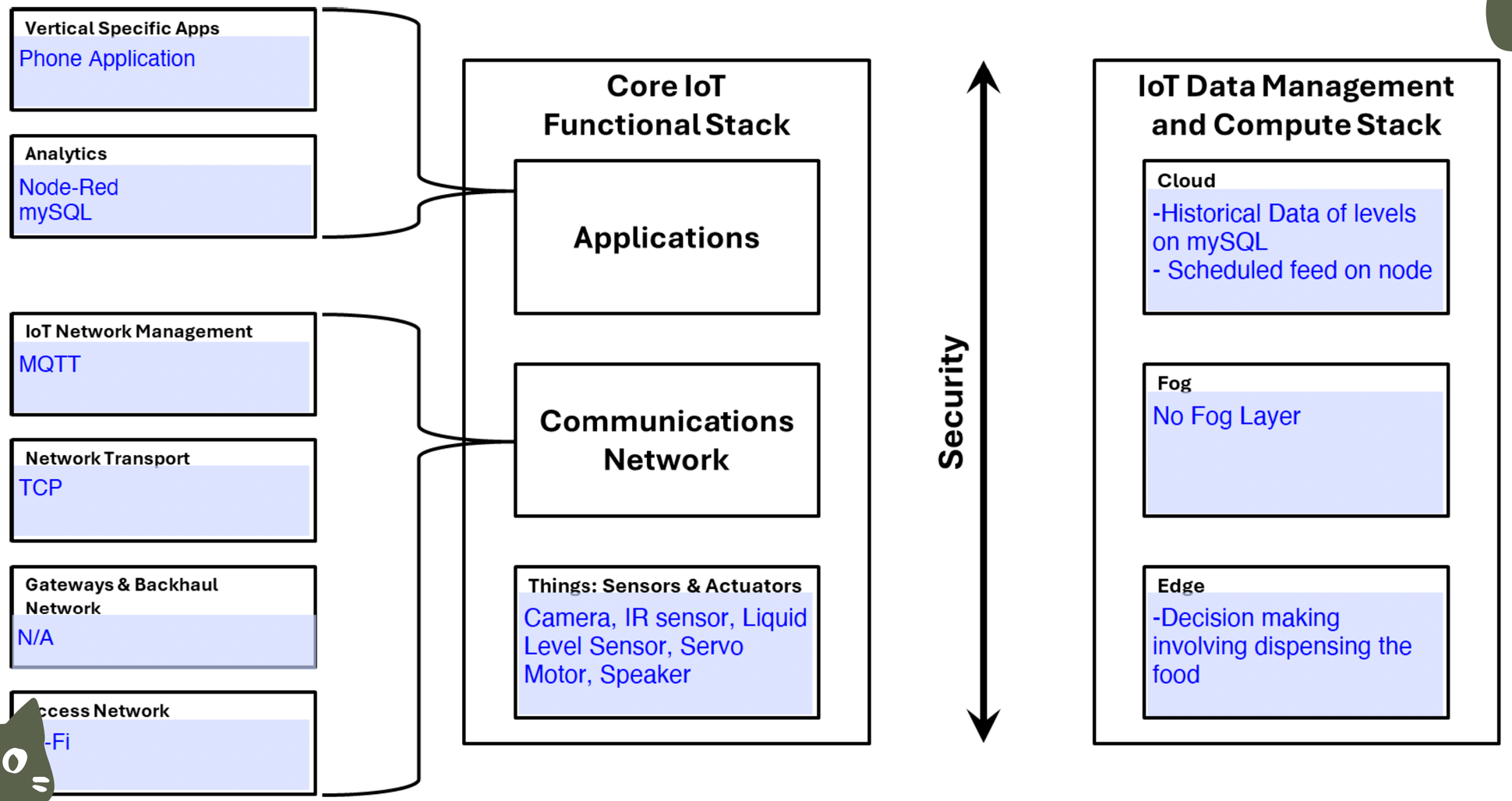
owners would feel reassured that their pet is cared for even when they are away or busy

3

Advertising

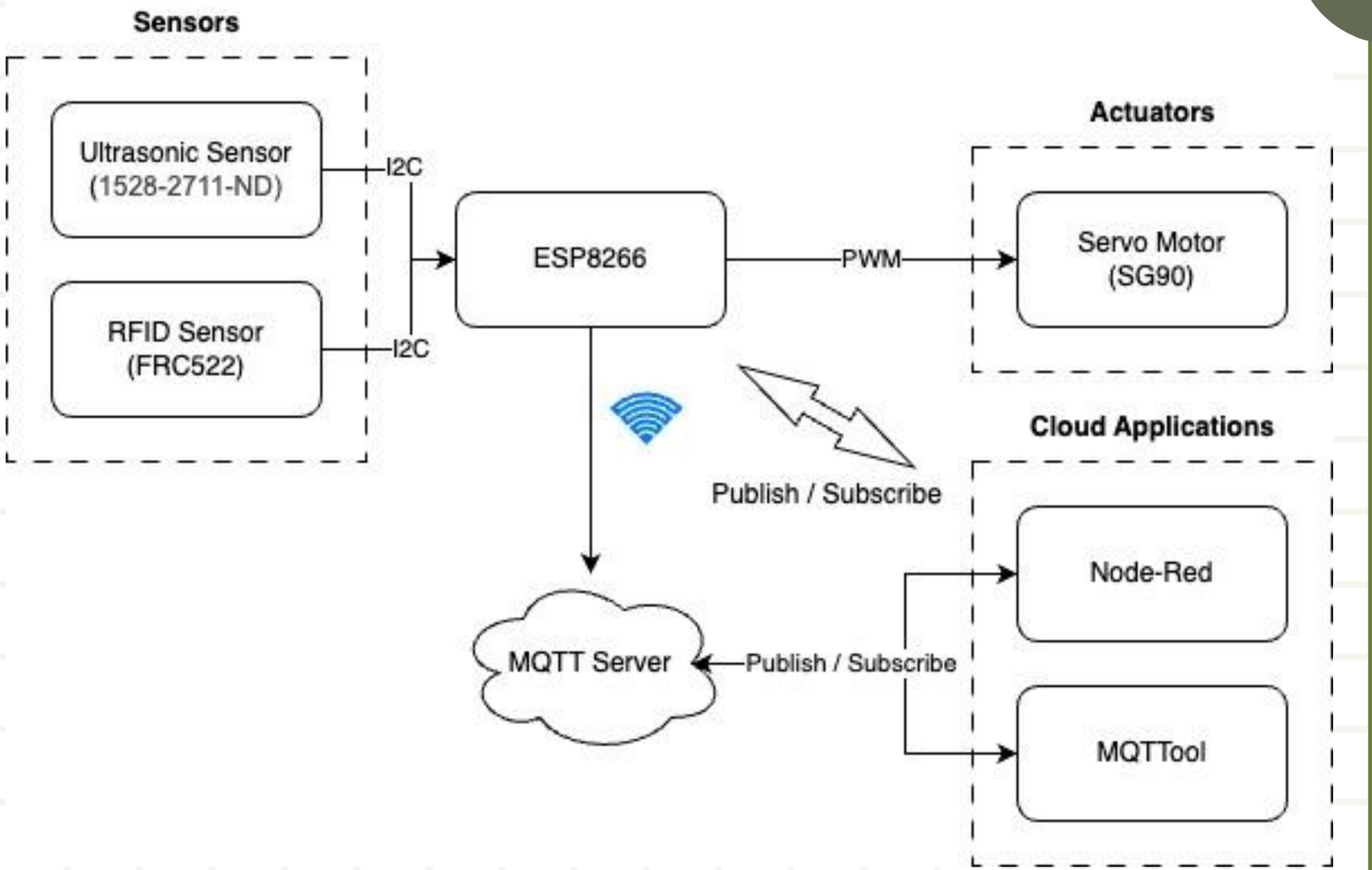
can get data regarding to customers pet feeding habits, which can drive product development, personalized recommendations, and targeted marketing

IoT Stack

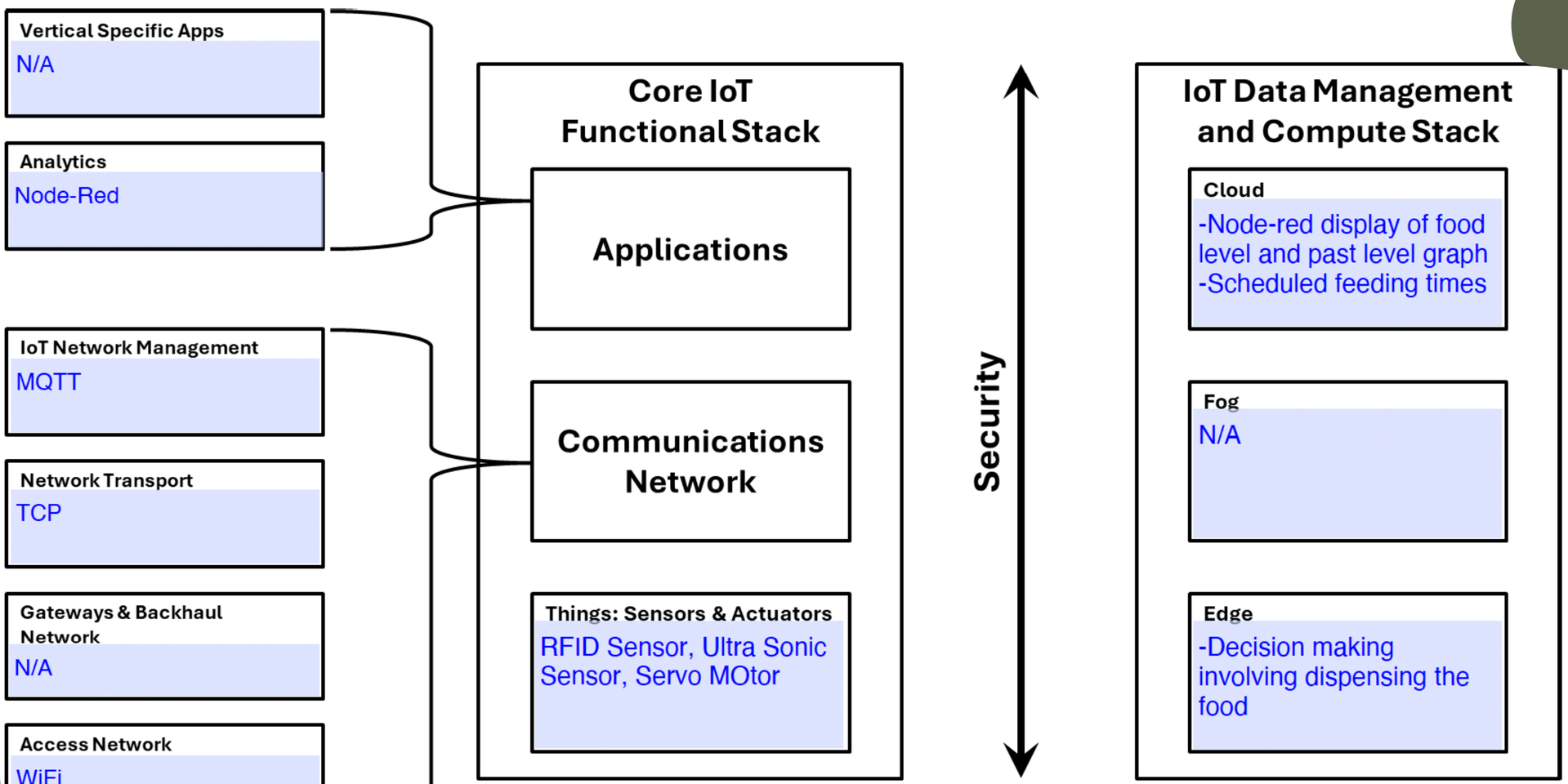

Vertical Specific Apps
Phone Application
Analytics
Node-Red
mySQL
IoT Network Management
MQTT
Network Transport
TCP
Gateways & Backhaul Network
N/A
ccess Network
-Fi
Core IoT Functional Stack
Applications
Communications Network
Things: Sensors & Actuators
Camera, IR sensor, Liquid Level Sensor, Servo Motor, Speaker
Security
IoT Data Management and Compute Stack
Cloud
-Historical Data of levels on mySQL
- Scheduled feed on node
Fog
No Fog Layer
Edge
-Decision making involving dispensing the food

Proof of concept

- **Using RFID tags** multiple pets can access their food on a timely basis
- **Unique ID's** will dispense their respective foods – which can be customized
- **Ultrasonic level sensors** will be used to monitor the food left in the reserve
- **Using an MQTT protocol** users can dispense food manually or in a timed fashion



IoT Stack


Vertical Specific Apps
N/A
Analytics
Node-Red
IoT Network Management
MQTT
Network Transport
TCP
Gateways & Backhaul Network
N/A
Access Network
WiFi
Core IoT Functional Stack
Applications
Communications Network
Things: Sensors & Actuators
RFID Sensor, Ultra Sonic Sensor, Servo MOtor
Security
IoT Data Management and Compute Stack
Cloud
-Node-red display of food level and past level graph
-Scheduled feeding times
Fog
N/A
Edge
-Decision making involving dispensing the food

Proof of Concept Expenses

Component	Quantity	Cost	Total
ESP8266	1	$14	$60
Ultrasonic Sensor	1	$6	
RFID Sensor	1	$5	
Servo Motor	1	$15	
3D Printed Components	1	$20	

Demonstration!

THANK YOU

by Team SLEY