# **ANALYSIS**

# **PART 1**

# **Step 1: Analyse Problem**

# **Problem Statement**

The shelter requires a low-cost automated feeder system designed to serve both cats and dogs. The feeder should be capable of dispensing food at preconfigured times and use sensors such as a bowl weight sensor, infrared “bowl empty” detector, or a load cell to monitor consumption accurately. It must also provide alerts to staffs in situations where food fails to dispense, the food placed in the bowl is not eaten within the specified time, or when the storage bin runs empty. Additionally, the system should log all events including dispense times, the amount of food served and consumed, as well as any alerts raised for later review and analysis.

**Features Required:**

1. Configurable feeding schedule. (eg: 2 times a day per bowl)
2. Portion control (gm or secs of servo rotation).
3. Safety interlocks (stops motor on jam, when the door opens)
4. Alerts via buzzer or LED and messages (email/SMS etc).
5. Manual Override (Feed Now Button) with logging.

**Inputs**

* **Current Time:** Retrieved from the Real-Time Clock (RTC) to trigger scheduled operations.
* **Schedule Times:** Preconfigured feeding times (e.g., 08:00 and 18:00).
* **Portion Size:** Defined either in grams or as servo rotation duration (servo-seconds).
* **Bowl Weight:** Measured via the load cell to track consumption.
* **Bin Level:** Sensor feedback showing food status (OK / Low / Empty).
* **Dispenser Feedback (Optional):** Motor current sensor or rotation sensor to detect jams.
* **Manual Feed Button:** User input to trigger dispensing on demand.

**Outputs**

* **Servo Action:** Controls rotation to release food pellets.
* **Alerts:** Buzzer or LED notifications for low food, jam, or missed feeding.
* **Event Logging:** Timestamped entries recording actions and alerts.
* **Future Expansion:** Capability for network alerts such as SMS or email.

**Assumptions & Limitations:**

* Dispenses one type of dry food (pellets).
* Uses low-cost hardware: Arduino, servo motor, load cell, bin-level sensor.
* Single bowl per unit; scalable to multiple bowls.
* RTC module for scheduling; daylight savings adjusted manually.
* Designed for low power, limited memory, and reliable operation.

**BLOCK DIAGRAM OF PET FEEDER**

