Step 1: Understand and Define the Problem (Analyse)

Problem Statement

The local animal shelter needs low cost, programmable automated pet feeder that can dispense foods for the cats and dogs at the scheduled time which also monitors whether the foods has been consumed or not and how much the food has been taken. The system should also alert staff if there is any issue with the food i.e. no food dispensed or any food not eaten. The automated pet feeder system should be developed using affordable components, which will be easy to maintain and programmable.

The feeder must include the following features:  
1. It should be time-based automation for scheduling the food dispensing.

2. Sensor should be used for monitoring the food consumptions.

3. Alert system for alerting the staff if some issue comes.

4. Low cost and simple component to be used.

5. Power supply

6. Feeder system will only dispense one type of pet food.

Inputs needed for the automated pet feeder:

1. Real time clock for timer
2. Feeding schedule which will be set by the staff.
3. Button for manual override so that staff can control when needed.
4. Sensor data for food dispensed.

Output needed for automated pet feeder:

1. Motor driven mechanism for dispensed food.
2. LED indicator to know the current status.
3. Giving alerts if any types of issues occur.
4. Records of the feeding.

Possible assumptions for the automated pet feeders are:

1. Only processes one type of pet food.
2. Automated feeder will have low memory storage.
3. Basic sensor will be used to detect whether there is food or not.
4. Automated pet feeder system will run on main or battery.
5. Pets need to eat food within the prefixed time.

Possible limitation for the automated pet feeders is:

1. It doesn’t process all the type of pet foods.
2. Limited memory storage
3. Accuracy will directly be depended on the quality of sensor used.
4. Food refills will be done manually.

Below is the block diagram of the automated pet feeder system. From the block diagram we can easily see what the inputs and the outputs are. Real time clock, feeding schedule, sensor data and power supply are the inputs and the alert system and feeding logs are the output.

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