**PART 1: On the Solving Problem Process**

**Analyse the problem and define its requirements.**

Problem: To provide proper portions of foods for cats and dogs at schedule times. Check whether the food has been provided or not, if provided check if eaten or not. Alert staff is there is any operational problem or any sort of problem.

**What features must the feeder include?**

**Feeding routine:** Staff must be able to program the feeding system multiple times a day.

**Accurate portion dispensing:** It must be time based or weight based.

**Observe Consumption**:Keep watch on consumption of food whether it is eaten on a proper time.

**Alert system or fault detection:** Notifystaff if there is any problem with the system or any fault with it.

**Simple user interface:** Easy to use system for the users, like buttons, LEDs, small display or even an alarm chip.

**Low food alert:** A sensorchecks the whether the food level is running low and warns the staff.

**What inputs and outputs are needed?**

**Inputs:**

Clock: Provides time to trigger the scheduled events.

Sensors: Basically, it warns the staffs, if the food is not in the bowl, or the food is not supplied up to required portion.

Portion Size: How much amount of food to be given to a particular pet.

**Outputs:**

Activation motor: It sends electrical signals to motor to start or stop/end the system/scheduled event.

Staff alerts: Buzzers, LEDs or even as an option SMS notification.

Logs: Timestamped feedings event and issues.

**What are possible assumptions or limitations?**

**Assumptions:**

* Only dry food can be used.
* Only a single type of food can be used at a particular time.
* Sensors are very simple, and low of cost.
* IfSMS as an alert is kept then network notification.
* Power supply is stable.
* The staff members are well aware of this system and aware of all types of alerts and issues.

**Limitations:**

* If the sensors are low of cost then it only senses the presence of food, not the exact quantity of food.
* Wet food is not supported.
* Multiple food types cannot be used at a single time.
* If bowls are shared internally then it may confuse the detection sensor.
* The system cannot differentiate between pet if it has access to more than one pet.