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# Automatic animals feeding machine

## Software Design Document



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# 1. INTRODUCTION

## 1.1 Purpose

This software design document describes the architecture and system design of an Automatic feeding machine.

This Software Design Description is written for knowledgeable software professionals and designers.

intended audience for this document :

- Team
- Project facilitator
- Auditors and Reviewers

## 1.2 Scope

Using Arduino (ESP32) and some sensors (proximity or rf) to identify a unique 'pet' user trying to feed itself from the automatic machine. It can differentiate between several id holders in order to solve the problem of feeding habits and needs.

The system should also include an interface using Node-Red to allow a friendly interface and control patterns.

## 1.3 Overview

The Software Design Document is divided into 8 sections.

The sections of the Software Design Document are:

- 1 Introduction
- 2 System Overview
- 3 System Architecture
- 4 Data Design
- 5 Component Design
- 6 Human Interface Design
- 7 Requirements Matrix

## 2. SYSTEM OVERVIEW

The machine software will allow tracking the consumption behavior of the cats that are registered in the system, In addition, the system will be able to identify an anomaly in consumption behavior and warn about it By cross-referencing with the information stored in the database.

The software will know how to identify cats that are not registered in the system and thus prevent them from accessing the system i.e. will not provide for them food.

The software will analyze food intake behavior patterns and thus allow each animal a custom dish.

## 3. SYSTEM ARCHITECTURE

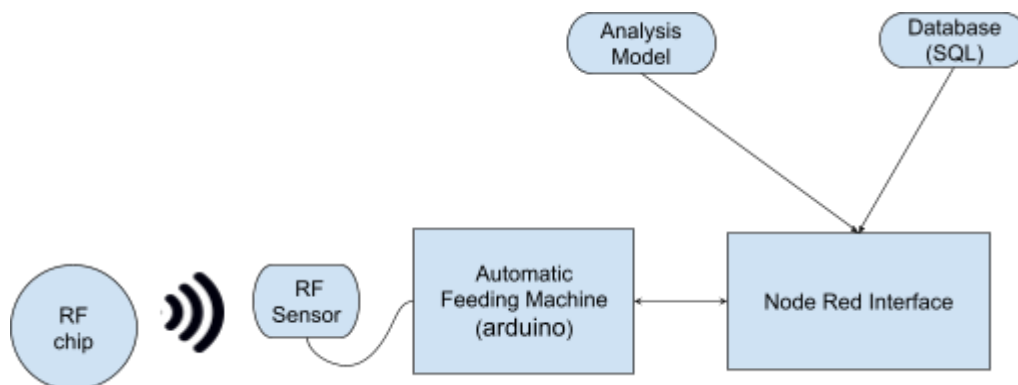
### 3.1 Architectural Design

Node-red - Interfaces all systems together in one common language .

Database - In the database, we will save all the information we collect about the animal that we will monitor, such as the last feeding time, animal id etc.

Arduino - An interface that aims to create a convenient and inexpensive environment for product development that combines software with electronics components

### 3.2 Decomposition Description



Class Diagram -need to complete

Object Diagram - need to complete

### 3.3 Design Rationale

It was important for us to implement the functionality of identifying the cat's food intake patterns,

And that's to avoid unnecessary food throwing and save user costs,

Functionality can be implemented using a database that will save the data and a model that will process and analyze the data .

To create the possibility of communication between several systems

We chose node-red, because it allows several different systems to "chat" with each other.

To write codes , compile and flash them to the hardware components we had to use the arduino development environment.

## 4. DATA DESIGN

### 4.1 Data Description

The objects are stored in one table, with the following columns :

the cat id , last time feeding , daily consuming food amount ect..

This database will be updated every several hours.

### 4.2 Data Dictionary

cat id	meal time	meal date	meal_weight (g)	frequency
"111"	8:00	1.1.2021	50	1

## 5. COMPONENT DESIGN

In this section, we take a closer look at what each component does in a more systematic way. If you gave a functional description in section 3.2, provide a summary of your algorithm for each function listed in 3.2 in procedural description language (PDL) or pseudocode. If you gave an OO description, summarize each object member function for all the objects listed in 3.2 in PDL or pseudocode. Describe any local data when necessary.

## 6. HUMAN INTERFACE DESIGN

### 6.1 Overview of User Interface

### 6.2 Screen Images

### 6.3 Screen Objects and Actions

## 7. REQUIREMENTS MATRIX

Provide a cross reference that traces components and data structures to the requirements in your SRS document.

Use a tabular format to show which system components satisfy each of the functional requirements from the SRS. Refer to the functional requirements by the numbers/codes that you gave them in the SRS.