University of Houston
Department of Engineering Technology
ELET 4308/ Senior Project

Smokeless Microcontrolled Ashtray

Fall 2006
Team 9

Presented By:
Mohammed Ahmad
Liem Nguyen
Vishnukumar Ramia
Maria Garza

Smokeless Microcontrolled Ashtray

- Team #9
  - Vishnukumar Ramia-Intro, Background, Project Motivation
  - Maria Garza- Design Objective, How it Works
  - Mohammed Ahmad-Design Description, Design Specifications
  - Liem Nguyen-Construction Constraints, Hardware & Software Flowcharts, Costs

Background Information

- The S.M.C.A.'s aimed market will be designed for all smokers who specifically smoke in an isolated vehicle.
- Effective Activated Carbon Filter
- Reduced harmful effects of second hand smoke
- Effectively absorbs smoke and odors
- Runs on a car adapter plug
- Easy to clean and portable

Project Motivation

- Smoking in car with windows down.
- No way to reduce the litter caused by cigarette butts.
- Cigarettes are the most littered item in the world, it is estimated that more then several trillion-cigarette butts are littered every year. Just in Texas it is estimated that more then 130 million cigarette buds are found on the Texas highways.

Design Objective

- The teams main goal is to reduce cigarette smoke from an isolated automobile.
- Reasons why:
  - ✓ If a driver smoked in a car with several people in the same car the SMCA would reduce second hand smoke from anybody riding in the car.
  - ✓ SMCA will help the environment by reducing the littering on the roads and highways. Many people don't realize that cigarettes are not biodegradable.

How it Works

1. When the lit cigarette is detected with the smoke sensor a signal is sent to the microcontroller.

2. Then the proximity sensor will be constantly checking for a passenger

3. If the microcontroller obtains a signal from both the smoke and the proximity sensor then the fan speed will be set to 2 (12V-3800rpm), however, if only the signal from the smoke sensor is detected the fan speed will be set to 1 (9V-2850rpm).

4. The smoke is sucked through activated carbon filter in the chamber by the fan.

Design Description

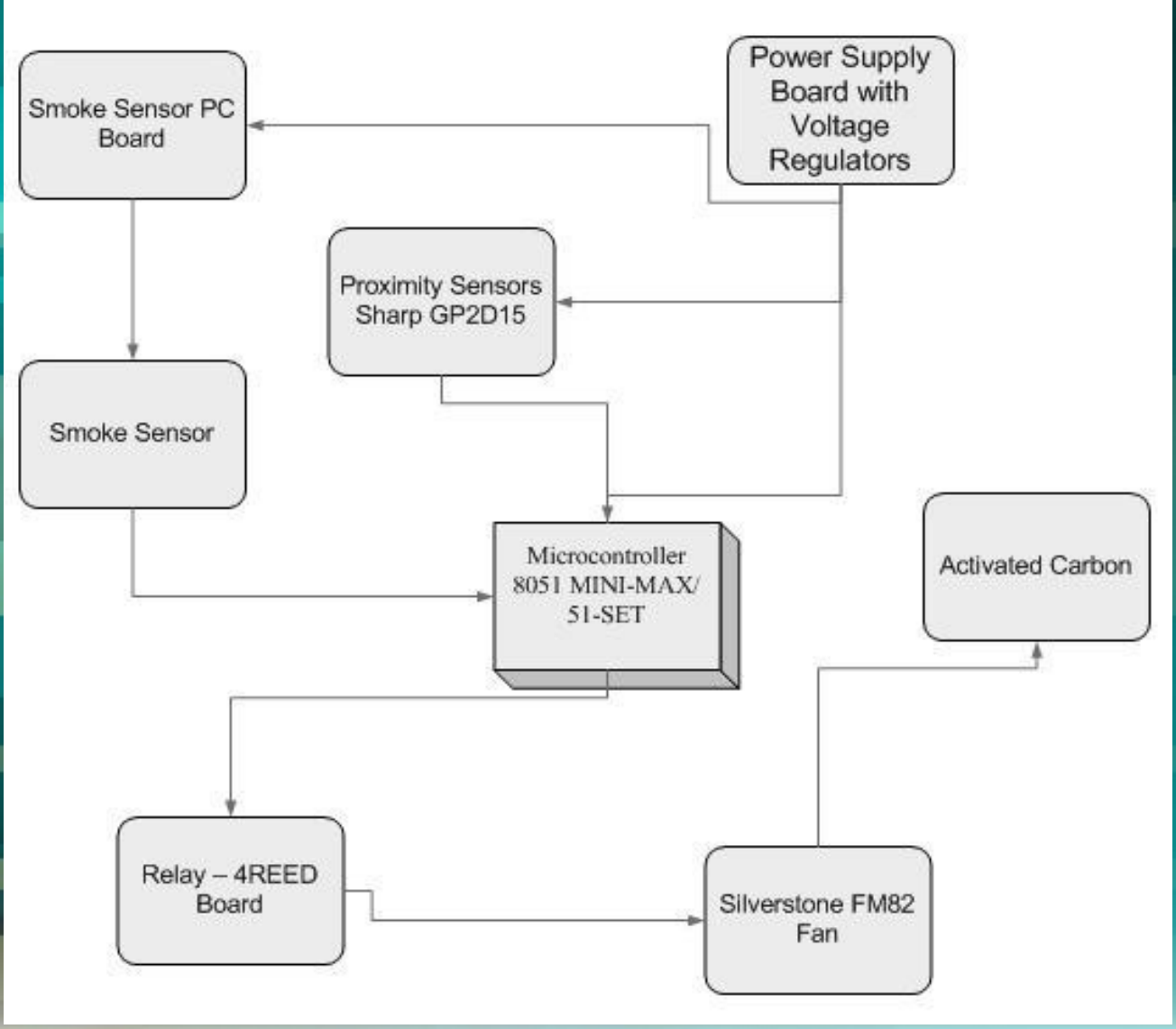
Design Specifications

- Silverstone FM82 PC fan:
- Sharp GP2D15
- CMOS MC145012 IC and Photoelectric Smoke Sensor
- 8051 Mini-max C2 Training Board SET II
- Reed Relay Board for 8051
- Voltage Regulator - LM78L62ACZ
- Voltage Regulator - LM7805
- Voltage Regulator - NTE1910
- Activated Carbon

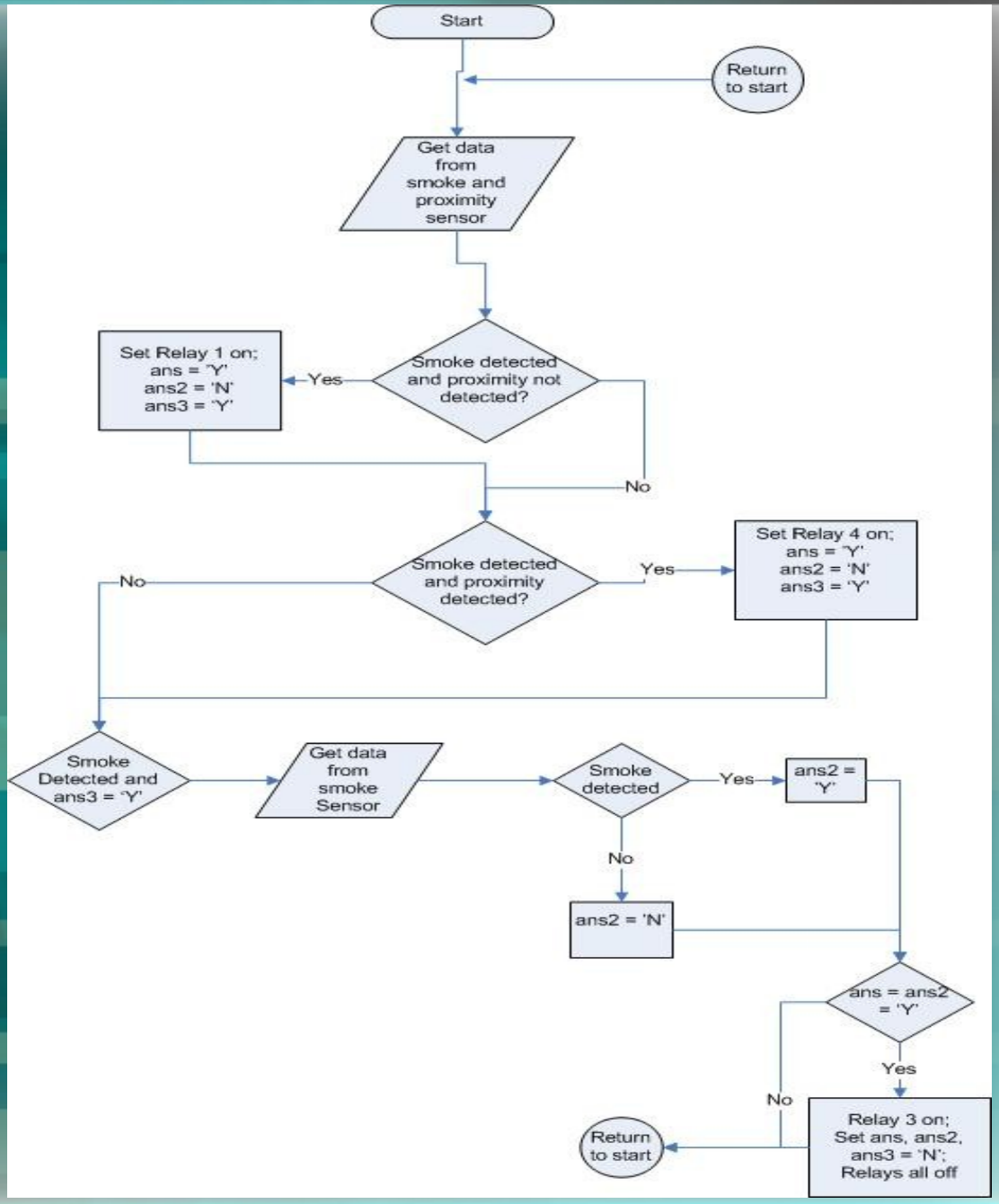
Construction Constraints

- **Contraints**
  - Limited to a small size to fit in normal cup holder of cars. This will limit us to finding smaller size components and making it all fit nicely inside the product.
  - Limited to how well the fan will flow.
  - Limited to how the fan will be restricted by the filter.

Hardware Flowchart



Software Flowchart



Costs

Component Price List					
Number	Qty	Part	Description	Est. Cost	Act. Cost
1	1	Silverstone FM82 PC fan	80 x 80 x 25mm	$20.00	$19.98
2	1	Sharp GP2D15	10cm to 24cm Analog 5VDC 44.5mm x 18.9mm x 13.5mm	$12.18	$12.18
3	1	Activated Carbon Filteration	1lb canister - Home Depot	$15.00	$15.00
4	1	Smoke Decector	Smoke Detector	$5.50	$8.99
5	1	Aluminum Base	The base of the ashtry	$10.00	$10.00
6	1	Aluminum Block	Housing Machined design	$25.00	$25.00
7	1	Screws / bolts	Hardware Store	$10.00	$10.00
8	1	8051 Mini-max C2 Training Board SET II	Bipom electronics	$169.00	From UH
9	1	Reed Realy Board for 8051	Bipom electronics	$29.00	From UH
10	1	Voltage Regulator - LM78L62ACZ	6.2 Vout Voltage Regulator	$1.25	$1.25
11	1	Voltage Regulator - LM7805	5 Vout Voltage Regulator	$0.75	$0.75
12	1	Voltage Regulator - NTE1910	9 Vout Voltage Regulator	$1.80	$1.80
13	1	Cigarette Socket	Cigarette Socket for project display	$2.45	$2.45
14	1	Cigarette Plug	Cigarette plug for project display	$1.80	$1.80
15	1	Pine Wood	Pine woord for project display	$10.00	$8.50
			Total	$313.73	$117.70

Questions

????