EML4551 - Senior Design
Team 303: Formula 1/10
Customer Needs - Resubmit

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Needs Analysis:

1.2 Needs and requirements

In order to synthesize adequate customer needs and requirements, the team conducted an informal meeting with our sponsor Dr. Hooker and our advisor Dr. McConomy. During this meeting, basic assumptions and needs were discussed. By combing through the F 1/10 autonomous racing competition official website, we were able to find the rules and regulations that all vehicles must abide by in order to be eligible for competition. Based on these guidelines and the personal requests of our sponsor and advisor, the following criteria were established.

1.2.1 Needs/Customer Statements

Need Number	Customer Statement	Interpreted need
1	Vehicle should be capable of navigating from one room, down the hall, to another.	The vehicle needs to have the ability to propel itself forwards, backwards, steer left/right, and stop.
2	The vehicle needs to understand its environment and navigate the course autonomously.	The vehicle should have sensors and processors that interpret its surrounding environment and make decisions on where to go.
3	Needs to have the ability to switch between autonomous navigation and user control	The vehicle should include a feature which will override the autonomous navigation and allow a user to control the vehicle via remote.
4	All Decision making needs to be done on board the vehicle itself	All information must be processed on board of the vehicle
5	Needs to abide by the F1/10 Rules and Regulations	The vehicle's dimensions, electronics and features should all coincide with the competition rulebook.
6	Needs to have a killswitch feature.	The vehicle will have the ability to stop all operations on command.

1.2.2

Requirement Need	Need Number	Requirement
1	1	Vehicle will have a method to propel itself forward and backward on command.
2	1	Vehicle will have a method to change direction on command.
3	1	Vehicle will be able to stop on command.
4	2	Vehicle should have sensors to identify the distance between itself and objects in its surroundings.
5	3	Vehicle will be able to switch between user control and autonomous navigation.
6	4	All sensors and processing components will be physically located on the vehicle.
7	5	All aspects of the vehicle must abide by the F1/10 rulebook.
8	6	Vehicle will have a 'killswitch' operation that stops all functions.

1.2.3

Number	Constraint
1	Budget: less than $2000 unless approved by sponsor.
2	Weight and dimensions will abide by the F1/10 Rules and Regulations.
3	Sensors and microprocessors must be on board the system.
4	Sensors and microprocessors will abide by the F1/10 Rules and Regulations
5	Vehicle theme should be representative of Mel Brook's 1987 cult classic, 'Spaceballs: The Movie.'