

Final Project Proposal

Year: 2017 **Semester:** Fall **Team:** 15 **Project:** Super Susan
Creation Date: August 23, 2017 **Last Modified:** August 25, 2017

Team Members (#1 is Team Leader):

| | |
|--------------------------------------|-----------------------------------|
| Member 1: Clifton Somers | Email: csomers@purdue.edu |
| Member 2: Ziad Dannawi | Email: adannawi@purdue.edu |
| Member 3: Vignesh Karthikeyan | Email: vkarthi@purdue.edu |
| Member 4: Rebecca Salo | Email: rsalo@purdue.edu |

1.0 Project Description:

Super Susan is an automated spice rack targeted towards cooking enthusiasts and those desiring more organization in the kitchen. The rack is motorized, and features smartphone integration as well as sensors to detect the amount of spice left. The user will place containers of spices on the Super Susan, and the Super Susan will keep an inventory of the spices present (both the types and the remaining amount of each). A slick dial interface allows the user to command the Super Susan to present the user with the desired spice or display an updated inventory. This information will be conveyed both on a LCD screen on the Super Susan and through a phone app.

2.0 Roles and Responsibilities:

Ziad Dannawi has had experience working with both hardware and software development in various courses throughout his studies at Purdue University. He shall be the systems engineer for the group, ensuring that the various components of the project work together. Additionally, if any issues arise in the software or hardware department, he is expected to assist in alleviating them.

Rebecca Salo is an electrical engineer, and as such, she will be the lead hardware engineer. Rebecca has also had extensive leadership experience, including roles as the SWE Girl Scout Day Chair, chamber ensemble leader, camp counselor, and private music instructor. She has also been researching project management and issue tracking tools, so she will be taking some of the project management responsibilities.

Clifton Somers will draw on communication skills gained interning at General Electric and Rockwell Collins to be the team leader. Having started and led small campus brass ensembles like the Purdue German Polka Band, Clifton is familiar with leading groups and resolving conflicts. In support of his role, his background as a technician in the ECE Instrument Room and experience designing embedded systems inform his perspective on the overall system design.

Vignesh Karthikeyan is an avid freelance android developer who enjoys making fun projects for his friends to enjoy. In an attempt to tie his passion of weightlifting to his need to help people feel better in their own skin, he takes part in open source ergonomics projects in his free time. A

lower level understanding of computing from classes taken in compilers and computer architecture help him understand underlying concepts.

2.1 Homework Assignment Responsibilities

Homework responsibilities are detailed in Figure 1, below

| <i>Design Component Homework</i> | | <i>Professional Component Homework</i> | |
|----------------------------------|----|--|----|
| 3-Software Overview | ZD | 9-Legal Analysis | VK |
| 5-Electrical Overview | RS | 10-Reliability and Safety Analysis | ZD |
| 7-Mechanical Overview | CS | 11-Ethical/Environmental Analysis | CS |
| 8-Software Formalization | VK | 12-User Manual | RS |

ZD - Ziad Dannawi

VK - Vignesh Karthikeyan

RS - Rebecca Salo

CS - Clifton Somers

Figure 1. Assignment Responsibilities

3.0 Estimated Budget

A conservative estimate of the budget to develop the Super Susan is provided in Figure 2, below:

| Mechanical | Estimated Cost |
|------------------------|-----------------------|
| Stepper Motors | \$30.00 |
| 3D Printed Parts | \$30.00 |
| Packaging Materials | \$25.00 |
| Bearings | \$5.00 |
| Electrical | |
| Project Circuit Boards | \$50.00 |
| Electrical Components | \$60.00 |
| Barcode Scanner | \$40.00 |
| Other | |
| Spice Bottles | \$5.00 |
| Shipping | \$100.00 |
| Total Cost | \$350.00 |

Figure 2. Estimated Budget

The project costs shall be split equally among the four team members. Purdue is expected to cover the cost of the circuit boards, in addition to a \$300.00 allotment for parts and other project needs. Each team member is thus expected to contribute an estimated \$12.50 towards the overall project success.

4.0 Project Specific Success Criteria

Below are the criteria necessary to the success of our project:

1. An ability to take input instructions from a dial interface.
2. An ability to rotate the Super Susan using a stepper motor, and present desired object at delivery location.
3. An ability to centrally monitor the identities of spices on the Super Susan using RFID tags.
4. An ability to measure the remaining amount of contents of each container through weight measurement, with a minimum accuracy of 10% total amount.
5. An ability to view the Super Susan's inventory (identities and amounts) on a mobile device.

5.0 Sources Cited:

No external works were used to write this proposal.