490A - Midterm 1 Team Report and Individual Report

Submitted on Beachboard

2 Submissions:

- Team Report – One per team.
- Individual Report – 1 Page, Not Double Spaced, Detailing your contributions. Please mention if you worked with other team members on a specific aspect. Also include your perception of the contributions by other team members if you feel that the workload is not being distributed evenly or if members have been absent.

Format Guidelines: Not double-spaced, 12pt Calibri Font or similar. Should be mostly written (approx.. 60% or more), diagrams and images are necessary but should not comprise the majority of the report. The report should be long enough to demonstrate an understanding of the design problem being worked on and a commitment to the success of the entire project. The length of the report is ultimately up to the team.

Midterm Report 1 will be graded on completeness, thoroughness, and the overall attention given to the details.

Team Name

The name must describe the project. This team name must be included on the title page of all future reports, labs, etc. submitted by your team.

Team Members and Biography

On one page, include a picture of each team member and a short one paragraph biography for each. Biography should be professional and something that a prospective employer would be interested in (i.e. Engineering Interests and/or hobbies and other interests that make you unique).

Project Overview

Provide a one to two paragraph, non-technical, description of your project. This must be a clear, uncomplicated description that any lay person could understand. Include any diagrams or drawings to help the reader understand the project. Who is the intended end-user of this product?

Customer Needs

This was covered in class in much more depth. This should consist of a list of all customer needs. These are the non-technical requirements that the product needs to do in order to satisfy the needs of the customer.

Product/Project Specifications

This was covered in class in much more depth. There should be at least one specification for each item from the customer needs, and in most cases, multiple specifications will arise from one entry of the customer needs. These specifications contain the quantifiable measurable outcome for each need. A good guide is to think to yourself: You should have a perfectly working product so long as every specification is met, no other assumptions should have to be made in order for your product to work and for the customer to be satisfied and accept delivery.

Similar Products

Research other similar products and try to find commercial products that are similar to your proposed project. Describe the commercial products and how yours is different. Maybe your project has different abilities or uses different technology for implementation, cost, etc…

Societal and Environmental Impact or Importance

How does this product benefit society and the environment? Try to consider the larger impact and importance of your project. Consider low power devices and how your project can make efficient use of materials, batteries, and resources. Consider the sustainability of the product from many perspectives. Can the theoretical organization producing the product maintain the product line? Sustain employees growth and well-being? Serve the community? This is your chance to tout the positive implications of your project and is important these days, we don't just want to be creating a fad that ends up in the garbage but instead want to benefit people and society.

Product/Project Functional Description

Based on your early understanding of your project provide a <u>detailed discussion</u> regarding the design and software development of your project. Include a preliminary component block diagram that shows all the components and specify which you would design and which you would purchase (i.e. Off-The-Shelf Commercial Module like a BlueTooth Module or similar). Include a preliminary software overview flowchart and specify which blocks your team would develop and which would be obtained from open source or otherwise public sources. Are you using any open-source or manufacturer libraries. Identify the main computing component/s and describe why you are choosing it. What features of the microcontroller/fpga

are advantages for your design? What development environment are you using and how will your code be entered? How will debugging be performed? ISP or JTAG? Are you designing the microcontroller circuit yourself or using a development board? What are the pros and cons of choosing this route?

Work Breakdown Structure

Include a complete work breakdown structure which aims to address every deliverable aspect of the design. This should follow the "formalized" brainstorming that we practiced in class.

Preliminary Component Block Diagram

A block diagram should show all the components of your project and how they interact with each other on a hardware level, this should also include all necessary power systems and most importantly, all the connections that will be made. The block diagram should adhere to the principles covered in class. I review these very carefully in order to help you locate issues and problems before you commit time and money to development. This gives us the faith and confidence that what we are creating will work.

Subcomponent Descriptions and Operation

There should be a description for each component being used. How does it work? How does it work with other components? Etc..

Power System and Preliminary Power Budget

A block diagram should show all the components of your project and how they interact with each other on a hardware level, this should also include all necessary power systems and connections. The Power budget should list all the components and how much power is being used.

Software Flow Chart

A software flow chart should help us identify the software requirements for successful implementation of the project.

BOM – Bill of Materials

This should list all the components being used, the sources and cost.

References

Approximately 15 or more valuable sources should be used and cited in the bibliography. Although the internet, google and wikipedia is a convenient source, these should be limited. 3 or more sources must come from peer reviewed journals and periodicals. An attempt should be made to incorporate some aspect from these journals into your hardware or software, either an algorithm or hardware scheme.

The report should not be limited to these sections nor does it have to be in the order that has been laid out in this document. You should take an iterative approach to drafting this report and create an organization that best represents your project and team.

Grading Guidelines

As this is the first report, keep in mind that my emphasis and focus is on creating a good working understanding of the product/project and that has to start with the customer needs and specifications. Without those two being well defined, there is little chance of a successful project. A significant amount of time should be devoted to this area. Next in importance should be the work breakdown structure. This should help translate the specifications to the physical components that must be implemented for a successful project. Keep in mind that both hardware and software are considered to be physical and deliverable things. Once your work breakdown structure has evolved, only then can your preliminary component block diagram be created and make sense, from here the rest of the report and the subcomponent descriptions will make sense

A - All items are included and well defined. The entire project requirements is demonstrated to be well understood by the team. The project looks very promising and has a great chance of success. There are no obvious unknowns in your team's understanding of the product or problem.

B - All items are included and reasonably demonstrated to be understood, but there are still some gaps in understanding or the understanding hasn't been conveyed adequately to the reader.

C - Most items are included and some have not been sufficiently explained or expanded on.

D-F –Obvious questions and many holes/unknowns still persist in the design.