Team Chase Technologies

Progress Report:

Smart Irrigation System

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Introduction

The project, "C-sprinkler", is a smart irrigation system which has independent AI, remote control ability and cloud service. The goal of design is to help users to free their hands and still maintain their garden well even when they are away from their homes. The C-Sprinkler will still retain some functions of a tradition irrigation system, such as timers and changing directions of the sprinkler. There are three major components of the C-Sprinkler and the progress of each will be further presented in this report.

- Hardware, including control unit and sensors
- Software, including embedded system and networking
- Mobile App, which allows user has easy access to the system on their phone

Schedule
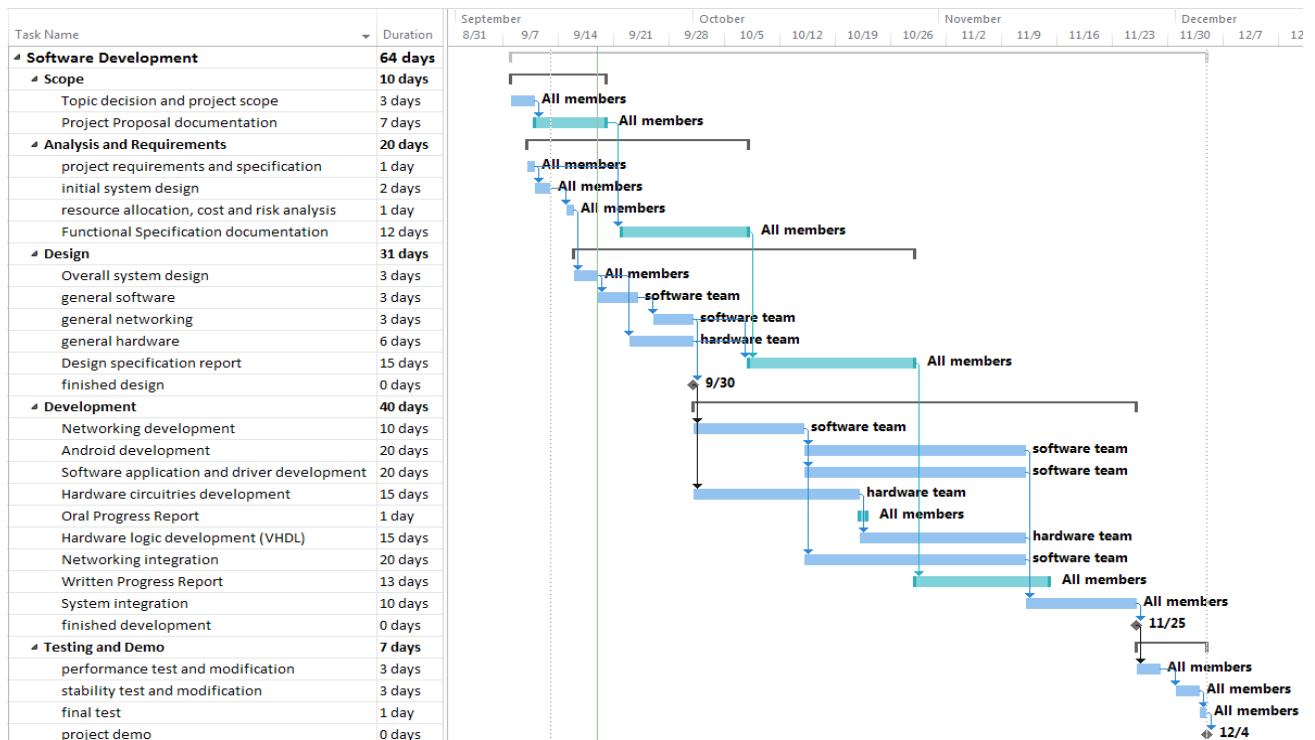
Figure 1: Original Schedule

Currently development of hardware is on time, but we are still testing the synchronization between mobile app and server which falls under network integration and we supposed to finish integrating before Nov 16. This means we will have to start system integration later and has less time to work on it.

Financial

So far, the source of our funding is by team member contribution, and the funding pool contains a total of 230 CAD. The following table contains a list of items we have purchased.

Item	Quantity	Cost (CAD)
DE2i-150 FPGA Development Kit	1	Borrowed
Electronic Components		41
Soil Moisture Sensor	2	5
Wire and Jumpers	1 (Pack)	15
Motion Sensor	2	5
DHT22 Sensor	2	10
10 Bit ADC	2	3
5V Relay	2	3
Irrigation Auto Inline Valve	1	17
Plug in Transformer 24V	1	20
		119
TOTAL		

Table 1: Expenditures up to data

As of now, there is still 110 CAD to work with. The future expenditures would be a shell for the hardware and probably some spare parts. The remaining of the funding pool should be able to cover the future expenditures.

Progress

Hardware Progress

There two main circuitry modules of the hardware. Firstly, the digital circuitry module on VHDL, has been finished on Nov 9 which was 10 days ahead of the original schedule. This part is designed to control the valve power, collect sensor data and communicate with processor, meanwhile maintain the traditional irrigation controller functionalities. The basic functionalities of the hardware such as timer, LCD display, valve control and PCIe connection have been verified and tested. Secondly, sensor circuitry in analog, has been finished on Oct 19. Currently we are preparing to move everything to the perfboard and building the suitable housing after measuring the dimension of the actual module. This step should be completed no later than Nov 25.

Software Progress

The main features such as tunnel connection has been finished on Nov 10 and the connection between mobile app and server has been also tested. The remaining tasks are to integrate the Yahoo Weather into the main logic app, and also the UI manager on embedded software.
The new deadline for this these tasks is Nov 24.

Mobile App Progress

The general frame of the mobile app has been built up and the functions have been tested using sample data on simulator on Nov 8. Google Nexus 7 (2013) has been chosen as our real-world testing mobile device since it has better support from Google and Android community, and also the hardware compatibility among the mainstream market. Right now the difficulty that we are facing is the synchronization between server and mobile app. There is a data format change that current mobile data format doesn't match with server's. If as planned we should have already finish this integration step on Nov 16, the new estimate date has been move 4 days later to Nov 20.

Summary

This report has briefly explained the current progress of the project. Our team has accomplished most of the major tasks but there is still a way to go before the scheduled deadline. The new expected period for system integration has been set to Nov 20 to Nov 25. Since we got the parts early enough, all the expenses are almost the same as we predicted. Even though the overall progress is slight behind the original schedule, at this moment we are still aiming to build our first prototype no later than Nov 25 and finish testing the functionality before the demo.