Progress Report - PillPal Medical Dispenser

Charanpreet Parmar, Clark Hsieh, Gurinder Dhaliwal, Izaak Lee

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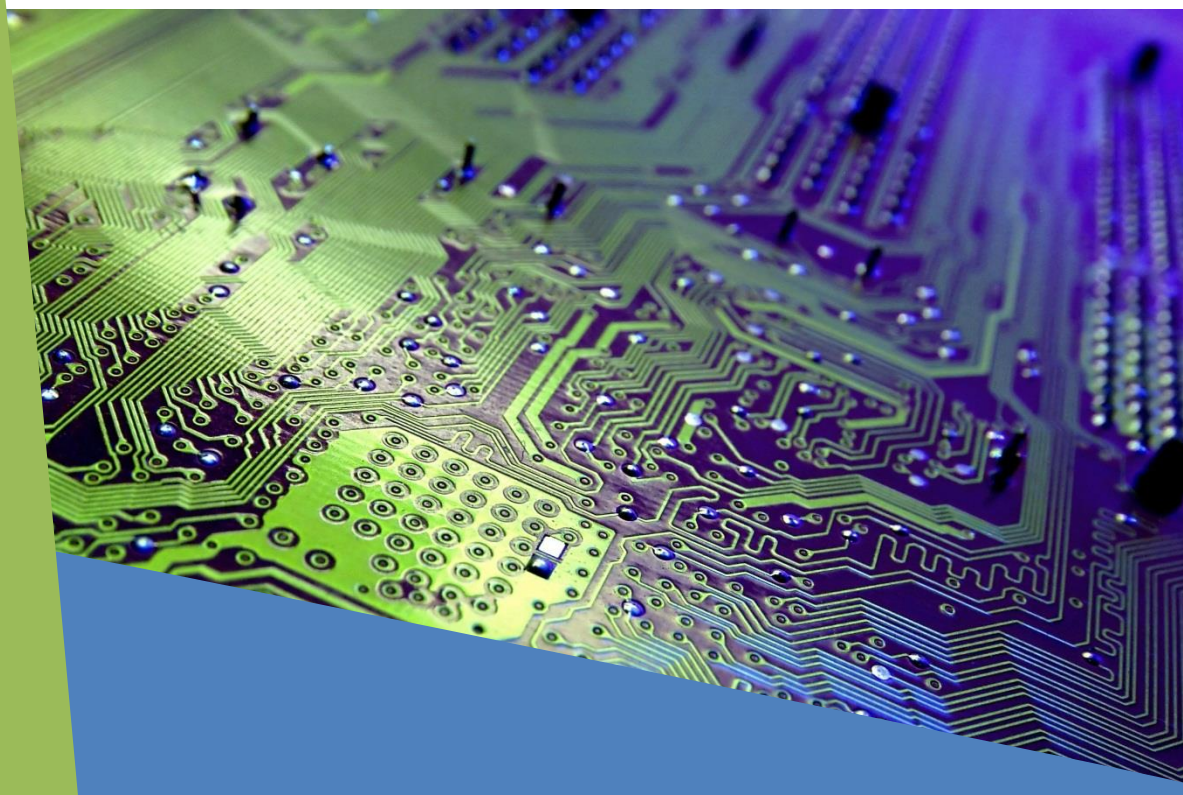
Revision 1.0



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Introduction

This documentation will outline the details of our progress, our expenditures and our projected plan for the next few weeks. Our project to create the product PillPal medical dispenser is currently in the final stages of integration and construction. We have been pursuing our project in a modular and methodical approach, it consists of software and three separate physical hardware modules. We also have been testing and tweaking the modules and is scheduled to be completed within the next week. During the integration phase, a few changes to our design were made to achieve our budgeted expenditures and enhance our overall design. Due to unforeseen problems and mishaps, the project is currently behind the previously projected schedule.

Schedule

The number of meetings has diminished as we go further and further into development as we all understand our role in this project and can work independently and efficiently without official meetings to guide our daily progress. We always communicate our progress via updates and share the logs on our subversion server to check our progress.

Initially during the project proposal phase we quoted the project testing to be completed on March 25th. Since we had a few delays with the vacuum and other shipping delays we are now roughly 1 week to 1.5 weeks behind.

April 1-5

- Finish all construction while debugging all firmware and software codes.

April 8-12

- Testing the whole system as a whole and tweak and improve functions and usability.

April 14-19

- Prepare and practice presentation and create a faux test demonstration.

Finances

At the moment, we have purchased 95% of the necessary materials required for the construction and function of the project. Our budget came in just under our grant of $1000 by the ESSS projects fund. The “additional costs” section was expected to be around $170, however, due to unexpected shipping and handling the total cost is higher than expected. The extra costs incurred by additional costs were offset by the fact that we chose to use a cheaper vacuum to demonstrate our prototype instead of a professional/ medical grade device that costs 10 times as much. We expect to spend a maximum of $50 more due to unforeseen expense of broken microchips, glue, wood, holding brackets, or other miscellaneous equipment.

Table 1 - Expense Incurred By Team

	# of Purchases	$$ Spent	AVG $/ Purchase
Izaak	2	$79.40	$39.70
Charanpreet	8	$392.95	$49.12
Clark	11	$464.76	$42.25
Gurinder	0	$0.00	$0.00

Table 2 - Expense Breakdown

Parts Cost Spent	**$686.31**
Additional Costs	$250.79
Actual Cost Spend	$937.10
Funding Acquired	$1000.00
%Spent	93.71%
$LEFT	62.90

We have kept all our receipts in digital form and can track and reimburse the spending their transactions. Detailed list is available upon request via an online link to a spreadsheet.

Hardware Progress

As of the moment, the two of the three modules have been completed and has been undergoing testing.

Label Reader:

- Hardware Team has successfully designed and constructed the Label Reader
- Firmware testing and developing has begun and is current at 80%.
    - Image capturing of label is successful
    - Rotating of bottle requires more weight
    - Stepper motor control is successful

Pill Allocator:

- Hardware Team has successfully designed and constructed the Pill Allocator
    - Exact placement of the “Dogs” are still required
    - Servo motor is mounted and fully operational
- Firmware testing
    - Microphoto sensor feedback implementation is required
    - Speed control is implemented, requires implementation with the complete code.

Vacuum Arm Manipulator:

- The construction Vacuum Arm Manipulator (VAM) is 80% complete. The final steps are being carefully reviewed by the hardware team to ensure ease of testing in the future.
    - Mounting of VAM incomplete
    - Vacuum testing complete
- Firmware testing
    - Waiting for hardware team to complete VAM

Software Progress

The Software is composed of two tracks: The Graphic User Interface (GUI) and the Firmware Development. The GUI is 99% complete and has been tested using the touch screen. The firmware development is currently at 20% completion. The process of the firmware development is stated in the hardware progress section.

Graphic User Interface:
The following is a list of outstanding items to be complete for the GUI portion.

- Running image processing - flow chart designed, has yet to be implemented in Pi.
- Serial communication between Raspberry Pi and Arduino - Code is commonly available, however testing is still required.
- Wifi connection requires testing - Plug and play dongle purchased, testing required.
- Scheduling of Short Message Service (SMS) is still required - SMS has been tested but scheduling is required.

Remediation

The design progress has gone smoothly with the exception of the VAM. The VAM is a key component in our design and requires both precision and power. After much research, an initial vacuum pump was purchased but failed to produce the necessary power. After consulting with a local company, it was determined that a specialized vacuum is required. The required vacuum cost was too high and thus to solve our problem, generic DC handheld vacuums were chosen. Through many purchases and testing, a vacuum is finally chosen and modified for our design. Also, there are many tweaks in terms of the actual mounting of the mechanical devices and are not significant for mention as it does not change the fundamental design and function of our device.

As a result of this event it has caused delays in our schedule and resulted in the last module to be complete. However, since the PillPal is designed to be modular the other modules were able to be completed with little delay.

Conclusion

The current progress is 75% completed in terms of the overall completion of the project. In terms of time, we are very close to completion as the initial part of conception and design occupied a greater length of time to allow for meticulous planning and organizing. Some changes mentioned in remediation are brief and non-blocking as they are only small design tweaks instead of a complete design overhaul. We are expected to meet our target and have our prototype ready for presentation on April 22nd, 2013.