Deliverable H

Kole Cantor

Jake Appleby

Matthew Perry

Tomas Silva Salanova

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Abstract

The deliverable that follows details the team's final cohesive prototype. This paper will describe the functionality and feedback associated with the final prototype, along with an explanation of the results and its advantages compared to similar products from other teams. Finally, the team updates its prototyping test plan and talks about its approach to the upcoming design day.

Prototype III Description

The final prototype consists of a comprehensive product. The comprehensive product will be made up of the user interface, which contains the interactive menu that allows the users to view current can, bottle, and keg filler speeds. Furthermore, the user interface is also composed of three separate lines—can, keg, and bottle—in which the users will be able to switch between, analyse efficiency data, and alter filler speeds. The comprehensive product will also consist of an Excel database. The Excel database will be the area where all data is computed and stored. This includes V-curve calculations, percent errors, efficiency readings, and graphical analysis. Raw client data will be inputted into the database, all calculations will be made, and when a filler speed is specified in the user interface, the data will be retrieved. Lastly, the comprehensive product will consist of an encryption system, which will require a user to input a password to enter the user interface.

Prototype III Feedback

The team was asked to get feedback on the visual aspect of our interface. We asked seven students, who will remain anonymous, to rate our interface out of ten. Below is the rating we received:

Student Number	Rating out of 10
Student #1	7/10
Student #2	8/10
Student #3	7/10
Student #4	6/10
Student #5	9/10
Student #6	7/10
Student #7	7/10

Table 1: Student feedback table

We received an average rating of 7.3 out of ten, which the team feels is acceptable. In addition to random student feedback, the team took feedback from the TAs to add a login username and password feature to the interface. Currently, we have implemented a pin system and are working on upgrading to a username and password login.

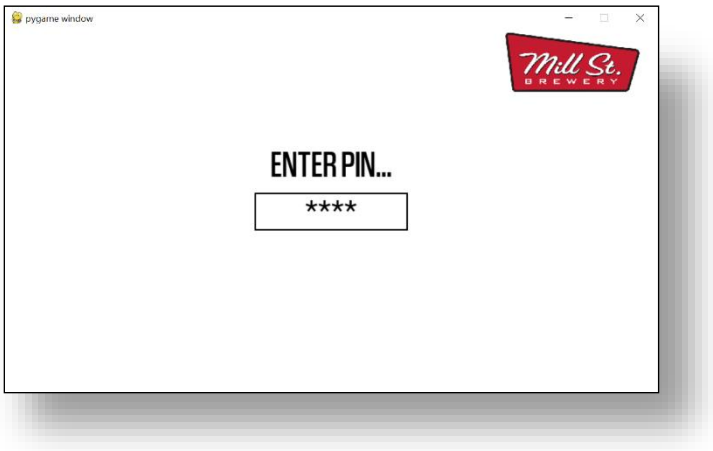

Figure 1: User Password Interface Display

During our final presentation, the professor asked us about a product name. We discussed this amongst our group and settled on the name Convey. We chose the name Convey for our product as it combines the conveyor aspect of Mill Street's brewing line with our product's aim to "convey" OEE information to the user. We feel that a product name adds to the professionalism of our product and makes it much easier to remember our product and its function.

We also received feedback about the presentation of our product during design day. Since our project is mainly coding, we don't really have much to show compared to the dust groups with physical products. So, we decided on using a large monitor to display our interface and allow participants on the design day to interact with it. This will be done to allow for an interactive experience with our product. We feel this will be the best way to leave a lasting impression on Design Day participants. Furthermore, I have managed to find a monitor to borrow for design day, so there will be no expenses.

Results and Advantages Explanation

The result of our comprehensive prototype is a fully functional interface-database system that provides important user feedback and process statistics. Although the team will still be working on the final product up until design day, it is important to outline several advantages of the team's approach.

Firstly, Convey offers the user full offline flexibility and manoeuvrability. When observing the Design Day competition, many of the participants used Apple IOS software to make mobile applications. Because Convey is made using Python and Excel, the interface system can be operated not only on Apple technologies but on all computer and tablet devices. We also believe that having the application available on a computer is more advantageous because if an employee were to be on their phone to use the software, the employer would have no way of

justifying whether that employee was actually working or not. In terms of offline flexibility, since Python code and Excel don't require internet access to be accessible, Convey can be used in any environment without issue, which was outlined as a client need.

Another advantage of Convey is that it can be manipulated with ease. In industry, the process line and the standards for efficiency are always changing. Unlike rigid mobile apps, Convey can be easily edited within the Excel database to account for new information and data sets. In addition, the equations used to calculate different variables such as OEE can be altered if a client expresses interest in doing so. Another feature Convey offered that the competition rejected was the concept of specific process feedback to help users raise line efficiency. Convey has within it a user feedback system that identifies the points in line that are most divergent from their ideal counterparts. Then the identified machines get outputted to the user as "points of interest, along with their corresponding errors and ideal values. The following figure below displays this functionality. In addition, the interest threshold for identifying these POI can be adjusted in the interface setting, giving the client flexibility and control. By giving the client the best feedback possible, the team satisfies another client need by providing the data needed to easily generate a positive 2% OEE.

V-Curve x Width	Percent Error	POI	OEE
3360	77.41%	Can Depallietizer	88.50%
840	65.44%	Conveyor Post Dep 1	Intrest Threshold
630	60.98%	Conveyor Post Dep 2	50.00%
630	63.87%	Conveyor Post Dep 3	Insert Filler
630	27.53%	0	175

Figure 2: Interest Threshold Excel System

Prototyping Test Plan

Since the last project deliverable, the team has finished integrating the prototypes into the final product. The team has observed full functionality of the system, with small errors that will continue to be corrected through our testing.

Test ID	Test Objective	Description of Prototype used and of Basic Test Method	Description of Results to be Recorded and how these results will be used	Estimated Test duration and planned start date
1	Create a simple main menu with	To test the interface, we	Checking any errors and	Testing already complete

	all the different lines	will make sure all the menus are working, and seeing if there are any errors in the code	comparing test results to theoretical results to determine whether it is good enough to be used	
2	Create an interface with no main menu and instead have always one of the lines showing, and being able to change between them	Testing will be very similar for all prototypes. It will involve using the interface and testing all possible scenarios to try and find bugs in the code.	Depending on how the interface performs relative to the other prototypes, the best aspects of it will be recorded (in terms of code).	Test already complete
3	Create a graphical program than can plot system speeds according to V-curve theory	Prototype will be made using excel, test will have user unput filler speed, with a resulting output of all ideal system speeds plotted on a dot chart	Result will be recorded when test successfully outputs desired values. These results will then be recoded for python and used in the final product	Test already complete
4	Create a comprehensive prototype the encompasses all aspects of the final product	Prototype will be made using python and tested for errors in code and calculations	Results will be used to make any final adjustments to the final product	Test already complete

Table 2: Prototype Test Plan

The team's focus is currently preparing for design day. We are currently working on the interface to make it look more aesthetically pleasing, with the goal being to display important data that will stand out to the judges. Further, we are working on the pitch presentation, which will contain all important information and justify why we believe our software product is the best choice. We have also been working on optimising our physical presentation, which will be composed of a poster board and a monitor that will display the user interface. The monitor should allow anyone to interact with the user interface.