1103 Project Deliverable F

Professor Foster

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Mackenzie Gillis, Jacob Hepburn, Randina Amarakoon

Table of Contents

Abstract

For this prototype since it is the first one, we decided that it would be beneficial to analyze the prototype ourselves first in a less costly way to prevent spending our budget to make a prototype that does not function or turn out the way we hoped it would. In saying this, we decided for our protype I that we would create a analytical comprehensive prototype that would aid in not only our comprehension of the design but other people as well. To do such a thing we convened as a team and thought a visual aspect of this design would work well and would help give us more insight on things like dimensions, overall look of the design and smaller parts that may not have been thought about much but in larger detail. We decided to use on shape which has a computer aided design software on it which makes it very convenient to use and create a prototype. This software was also available to us at no cost which helped with the cost and bill of materials in the end. The goal of this prototype was to not have to much focus on one specific part of the design, rather the design in a more comprehensive manner. Since this was not a physical prototype, we focused on the analytical portion of the design to ensure that everything worked and were able to see if there would be a problem with anything that is created. Overall while designing the computer aided design model, there were no problems that we ran into. This was helpful to us as it gave us more confidence in our design, and it will be very useful to have this information when developing further prototypes. To test the prototype, and reduce our cost, we decided to test with selected people who were aware of the problem we were designing for and have never seen or heard about our design before. We used their feedback as our test to see if the computer aided design would work in allowing more comprehension verses a verbally explained version of our design. In summation, this prototype is a comprehensive analytical version of our design used to gain more insight to help us in future prototyping.

Feedback Outline

During the client meeting the clients seemed to be overall impressed with the design that our group had come up with thus far. There were no overall negative implications that were brought up with the client or potential changes to be made. The clients did say that later they might have to look at the safety of the pressure washer and to make sure no one can easily be injured by it. However, they said this is not really an issue. The clients also were a little sceptical about how well the machine would clean the front and the back of the raft. Ultimately, we put their minds to ease by simply explaining how this should not be an issue as the pressured water almost makes something like a wall of water that the board would need to pass through which would end up washing the algae off. The little negative feedback received by the clients could be attributed to our group explaining that this idea is not a fresh idea, the system itself is essentially a modified version of a design that a group member worked with prior to this project. This shows accurate benchmarking to the clients and overall made them a bit more comfortable with the idea as this project already exists and works efficiently. Overall, the client meeting was thought to be very successful, and our group walked away with confidence in our design and was ready to start our prototype.

Prototype Development

This prototype was developed using a software that is meant for computer aided design. The software is found on a website called on shape and is free to use for us. To develop this prototype, we initially had a vision. To execute this vision, we made a variety of sketches before concluding. After coming to this conclusion, we scaled out dimensions that we thought would be appropriate for our design and that would stay in the space constraints that the client had given us. With these dimensions and a general design, we went to the computer aided design software and carefully crafted each part with the correct dimensions individually. This allowed for us to put more detail into each part and correctly scale it. Once the many individual parts were designed, they were all put together with the assembly feature on the on-shape software. With this there did seem to be some difficulties with the measurements, so some parts were adjusted accordingly. After putting features such as rotating objects and swinging doors, the design was done and could be looked at from any desired angle and depth. This gives anyone who looks at it a better understanding of not only our system overall, but how all the pieces would go together as a whole. In summation, CAD from on-shape was a very helpful tool that helped us develop our prototype I and that will aid in developing our future prototypes II, and III.

Test Plan

Question: Does this design make sense

Why: To see if there are any grey areas of the design that were not noticed previously

Focus: Visual

Testing Method: Comprehensive Analytical

Testing Protocol:

1. Create a rough sketch of the design
2. Find the dimensions of all properties of the design
3. Using a computer aided design software (we used on shape) create a online version of the sketched model with the proper dimensions
4. Find people who understand what the point of making this design is
5. Verbally explain to said people what the design you are creating is
6. Ask for feedback after verbally explaining the idea
7. Show the same group the computer aided design model of the prototype
8. Ask for feedback after showing them the visual design
9. See if the feedback improved and the visual design made them more comprehensive of the way the design works

Other Feedback

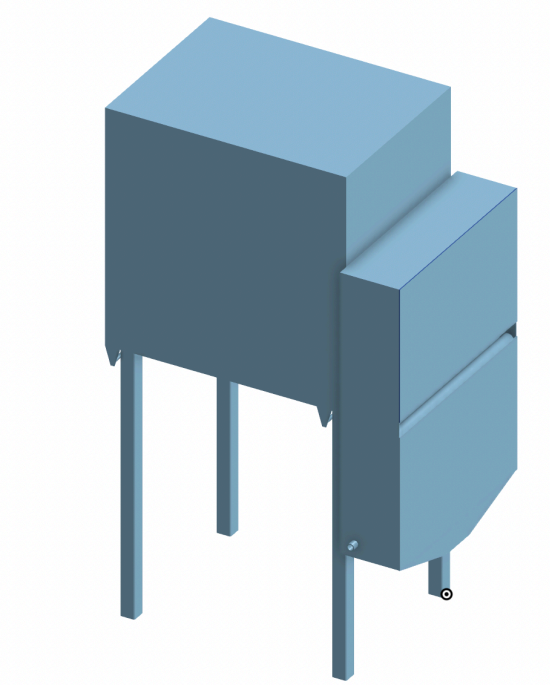
To get feedback from outside sources on this prototype and its development our group decided to do a few things. Firstly, after making the prototype, we sought out people who knew about the project we were designing. After finding these people we decided to verbally explain to them how our design would work and the general concept of it. Although many people who were sought out understood the idea to some extent, there was some overall confusion with the vision of the project and what it would look like in the end. After verbally explaining it, we showed the computer aided design version of the model so the people we asked had a visual perspective to understand the design and how it works. After showing the visual aspect of the design to people there was much less confusion and there was a much better understanding of the product overall. This demonstrated to us as a group that this prototype was a good tool and visual aid too many to help them understand the main concepts of our design. To conclude, this prototype was an excellent source of communication about our design based on the feedback we had received from other people rather than our clients themselves.

Bill of Materials

For this prototype since we decided to go for a communication-based prototype, and the software was already available to our group at no cost. The bill of materials for this protype was $0. If someone was trying to replicate this prototype in the future, and they had a computer aided design software it would also be free for them to make. However, if whoever was trying to replicate it didn't have a computer aided design software, they could use a free trial for 30 days or they could buy the computer aided design for $305 a month. In summation, this prototype did not cost any money and did not account for anything on our bill of materials.

Actual Prototype I

https://cad.onshape.com/documents/f2ae52e37b96e0da99fa5327/w/d61d1432c7f9f63d0fff3193/e/2ae6a1feb12d535fada68233?renderMode=1&uiState=63688acca57b0c322c01bca5



If you would like to see different angles and underneath the cover (which flips up just for visibility/ wouldn't in actual production) please click the link above. There would also be a belt with paddles on the two rollers in the actual design, as well as a power washer connected to the water system.

Conclusion

In summation, this prototype was made from a computer aided design software and costed the group no money to make. This prototype was made primary for the purpose of communication and seeing if others outside the group could understand the concept that we are projecting. The goal of this prototype is to shed light on any confusion on how our design will look and work.

References

Auto CAD. (2022, September 14). *AutoCAD software: Get prices & buy official autocad 2023*. Autodesk. Retrieved November 6, 2022, from https://www.autodesk.ca/en/products/autocad/overview?term=1-YEAR&tab=subscription