Group C13: Prototype II and Customer Feedback

GNG1103 - Engineering Design

Deliverable G - Prototype - II and Customer Feedback

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Introduction

This document outlines the second of the prototyping model, in which we introduce prototyping and how it applies to this particular stage of the testing. After a general introduction, the specifics of prototype 2 and its purpose will be explored. This includes going over the reasons for testing, objectives of the testing, and expected results which will allow for us to learn what to improve upon for the next working model.

Reason for Testing

*This is an introduction. Capture the reasons for the test, giving enough background information to justify doing **any** prototyping at all. Is the **general** objective one of: learning, communication, de-risking, etc.*

Prototyping is used to provide a sample of the design to test whether it meets the customer needs addressed in the earlier parts of design thinking. The purpose is to find out what works in our design or what things need us to change in the design based on the overall proof of concept, The idea is that we, as the design team, present the design through some kind of modelling, and the customers and/or users, based on their interpretations, will provide feedback about how it met their needs and where it requires improvements. At this point, a prototyping test has already been performed with a proof-of-concept model to present the general idea of what our objective is with this model. Because this prototype focuses on the critical subsystem, the testing method is an analytical simulation. This means that the model of the product is based on mathematical calculations and is based on the experimental functioning of the model.

Test Objectives Description:

*What are the **specific** test objectives?*

The specific test objectives of this prototype is to determine the functionality of the bracket system that will allow for a column to be folded up and transported in an efficient and ergonomic manner. Unlike the previous prototype, which focused on showing what the model could eventually look like, Prototype 2 focuses on observing how the model's subsystem would work to achieve the needs.

*What **exactly** is being learned or communicated with the prototype?*

The information being learned is what the critical subsystem of the model is capable of, what it excels in, and the possible flaws in its design. Essentially, the objective is to demonstrate

that it achieves its intended function, how it does this, and where it will be placed in the system. The idea is to demonstrate how this design will make use of its subsystem to achieve the goal of improving portability. It allows for us to see what works and what needs to be modified.

What are the possible types of result?

The first type of result is that the prototype does not achieve its intended function; quite simply, it might not work. However, seeing as this design is the product of a semester's worth of planning, calculating, modelling, and designing, this result is highly unlikely as efforts have been made to ensure that the design will work.

It is also possible that a smaller unforeseen error can emerge upon the completion of the prototype. It is possible that our idea, while functional, might require modifications in order to better suit the needs.

How will these results be used to make decisions or select concepts?

The result would help us know what to fix or what we need to adjust in our design instead of wasting money on the actual design, only to find out that it needs adjustments. This can affect the entire project and its resources. Furthermore, it could also identify possible errors in terms of the subsystem's functionality and/or usability that were unforeseen.

What are the criteria for test success or failure?

If the test result goes the same as our previous expectation of the prototype, then we regard it as a success. If the subsystem is able to perform its intended folding mechanism, then it is considered to be a success. Otherwise, we regard it as a failure.

What is going on and how is it being done?

*Describe the prototype **type** (e.g. focused or comprehensive) and the reason for the selection of this type of prototype.*

The prototype we will be building is of the focused type. This is because we will be focusing on just the bracket subsystem of the tower, which is the main mechanism of the tower system that will allow for the new system to be more portable than the pre-existing system. This system will demonstrate, with greater accuracy than prototype 1, how the model will be able to fold, how it will make sure that the water does not leak, and most importantly, how the

portability modifications will ensure the continuing of a fully-functioning plant wall. Seeing as this prototype's goal is to achieve the specific aspects of its function (ie. folding properly), it makes more sense to have a focused prototype as opposed to a comprehensive type, which focuses on many of the product attributes.

Describe the testing process in enough detail to allow someone else to build and test the prototype instead of you.

The process begins with identifying the purpose of the test. In this case, the purpose is to find out what works in our design or what things need us to change in the design based on the overall proof of concept. We will treat our prototype 1 as a scale model and try to figure whether our design is achievable or not based on how the customers perceive it. The proof of design aspect of prototype 1 means there are no quantitative attributes that can be measured, and instead, we will be looking at qualitative observations. To continue, it means that the presentation of the prototype to the customers is, in fact, the actual test of the prototype. The customers' reactions are to be observed, recorded, and analyzed during the presentation to be interpreted later on for the next working prototype.

*What information is being **measured**?*

The information being measured is full dimensions of the top and bottom brackets (includes the holes on the brackets). Also, the height of the system is essential to be measured. In terms of functional measurements, the focus is on how well the entire model is capable of folding.

*What is being observed and how is it being **recorded**?*

Being observed is the functionality of the folding mechanism; the intent is to make sure that this subsystem is fully functional, as it is the key aspect of our design. We will perform a number of tests to make sure that it can fold repeatedly, and these results will be noted down.

What materials are required and what is the approximate estimated cost?

The materials used in this prototype are cardboard, 3D printed filaments, and screws. The materials will cost nothing as they will be obtained from the Makerspace workshop.

What work (e.g. test software or construction or modeling work or research) needs to be done?

Research on the right materials to purchase and what work best for our prototype also again do some benchmarking with other similar product .By doing that, we can know what are their advantages and drawbacks so as to improve our design

When is it happening?

*How long will the test take and what are the **dependencies** (i.e. what needs to happen before the testing can occur)?*

This prototype 2 depends on the feedback from our clients when we collected from the prototype 1 presentation last Friday. We will use this feedback given to clarify any aspects of the overall proof-of-concept and then transfer this information in to our critical subsystem model.

A separate test planning Gantt chart can be created to help making sure that the testing fits with the overall project schedule or it can be defined as part of that schedule (i.e. as a sub-task).

We firmly agree with this sentiment.

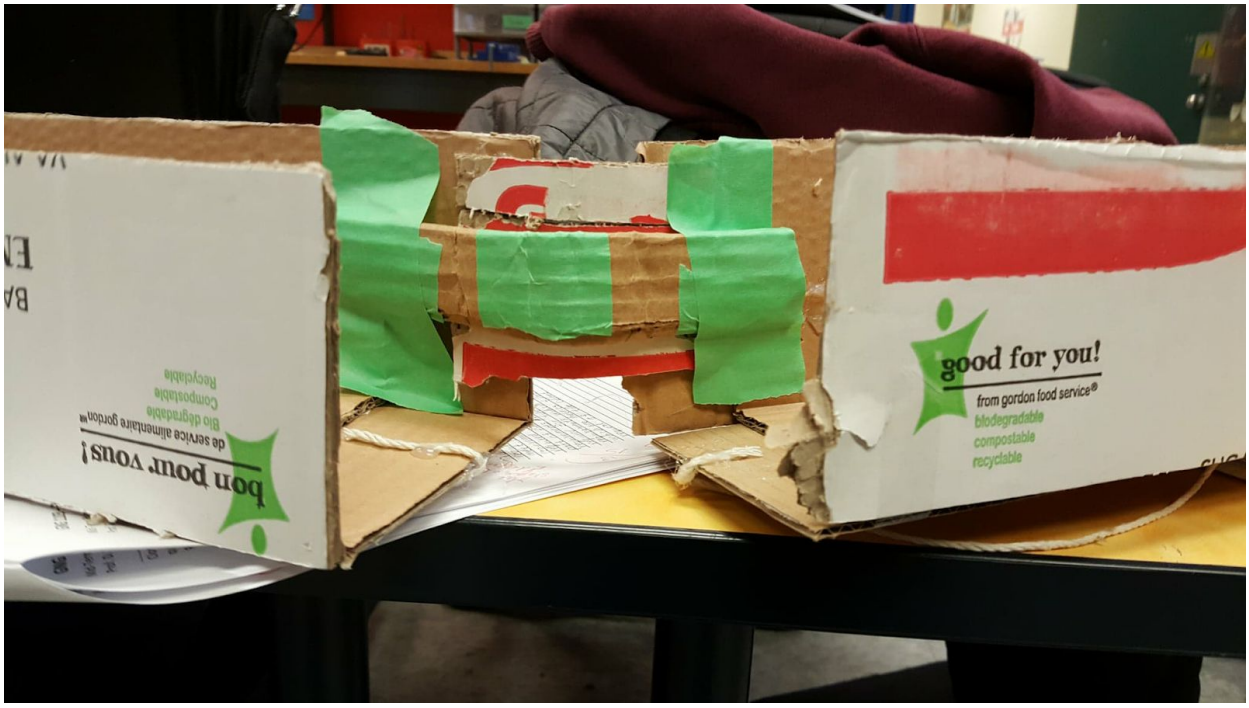
When are the results required (i.e. what depends on the results of this test in the project plan)?

The testing results are required to build our final prototype, therefore we want our results to be collected as soon as we have built and tested the prototype 2.

Conclusion:

This document provides a detailed explanation of Prototype II and our plans for building the prototype , A detailed testing procedures are provided for the second prototype and also the materials that are required for the construction of this prototype. Since prototype II is based on the customers feedback which adjustments would be made in the second prototype and also help in the third prototype this means we are close to the end of our design process since we have done the curitcal part asking for feedback.

Prototype Pictures: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