

# Magic Mirror

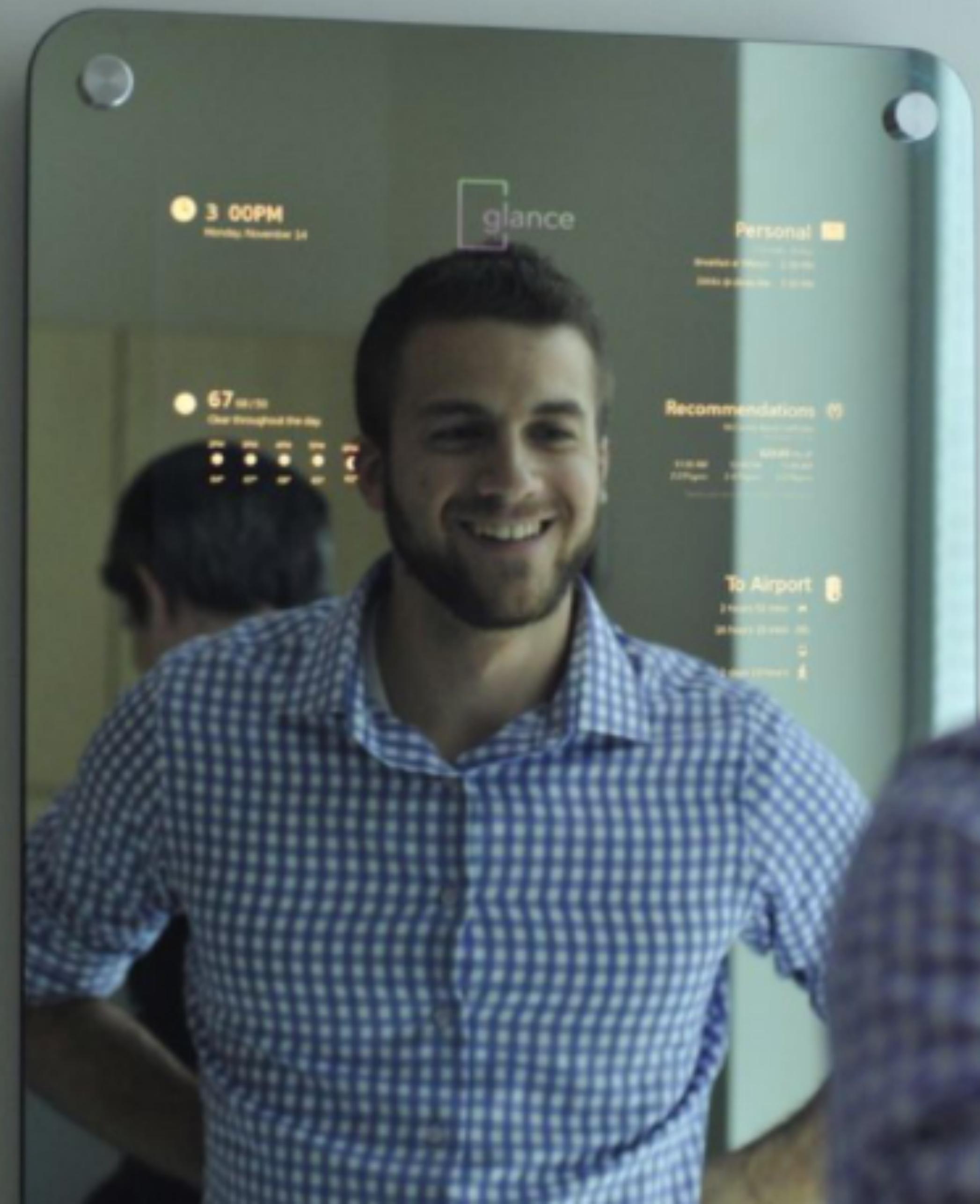
Tech 190A

Team 3

Jairo Caballero, Morgan Lewis, Gang Shen, Fredy Lopez, Rafael Cardoza

# Why We Chose this Project (Jairo Caballero)

- IoT devices have evolved and will increase in consumer demand as we step into more advanced technology in the coming years
- Smart technology is now being integrated with new homes being sold to consumers
- A smart mirror is a great addition from a design perspective to already existing smart devices (Alexa, smart blinds, smart thermostats, smart lights, etc)
- Ability for users to multitask and to serve as a tool for convenience and simplicity
- Ability to communicate with other smart devices such as a smartphone
- Ability to customize display settings based on user preference
- To produce something more affordable for the average consumer



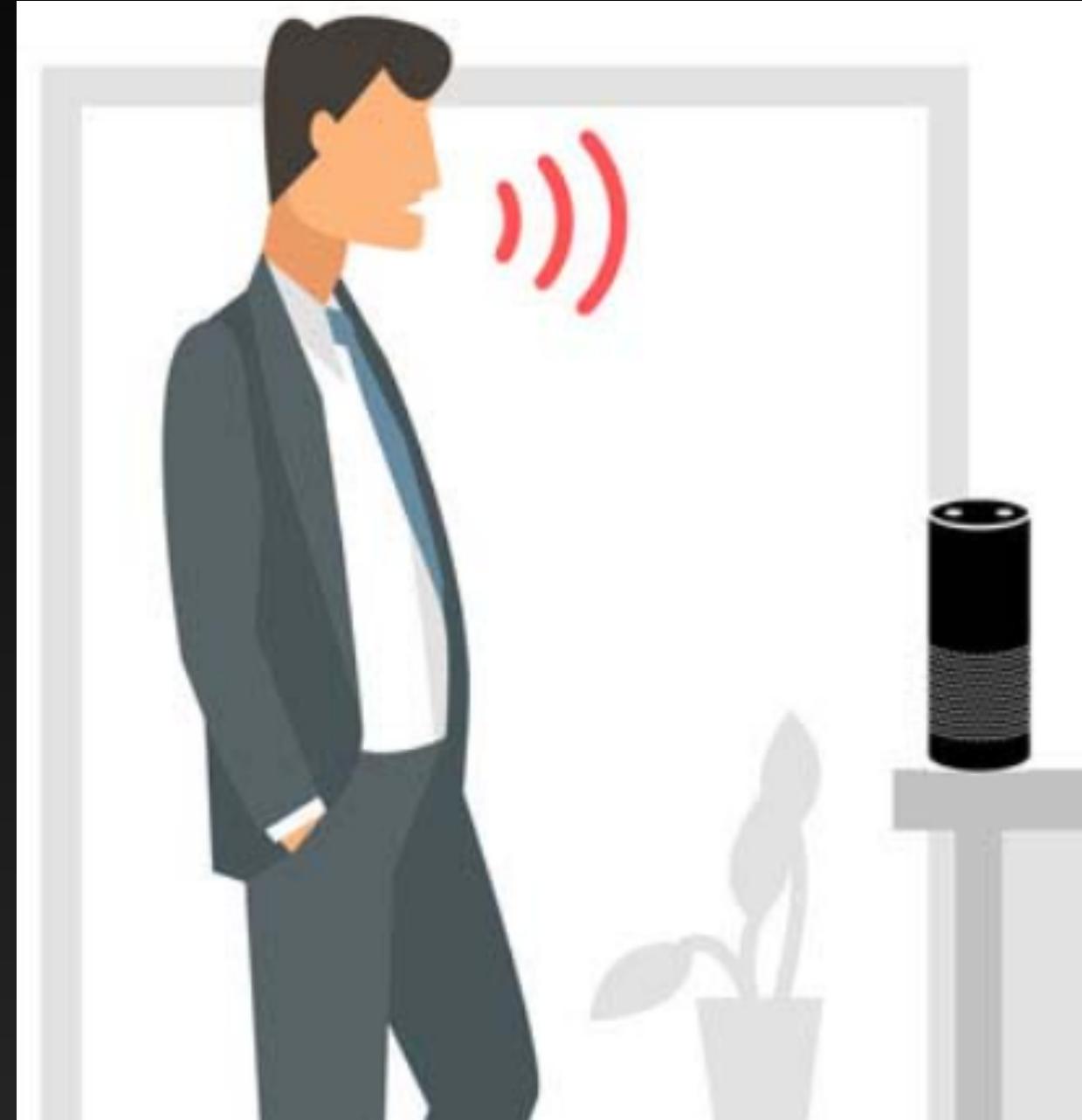
# Physical Components / Materials (Jairo Caballero)

- 20 x 28 in Sized Picture Frame
- $\frac{3}{4}$  inch plywood
- 20 x 28 Two Way Acrylic Mirror (more affordable)
- Raspberry Pi Kit
- Black Acrylic Paint
- Super Glue / Wood Glue
- Color Changing LED Lights
- Wood Screws
- Monitor
- Cardboard



# Software Components / Materials (Jairo Caballero)

- Bluetooth compatible
- Microphone (Voice Recognition via Alexa)
- Smart Phone (Display Customization)
- Implementing Magic Mirror Software
- Wireless Connection to the Internet to bring in local information

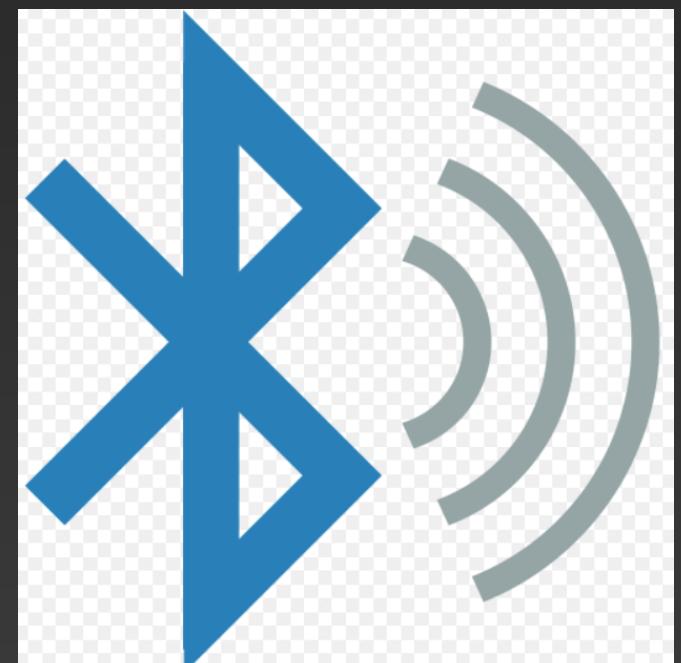


```
192.168.2.15 - PuTTY

var http = require('http');
var parseXML = require('xml2js').parseString;
var ili9341 = require('jsupm_ili9341');
var apds9960 = require('jsupm_apds9960');

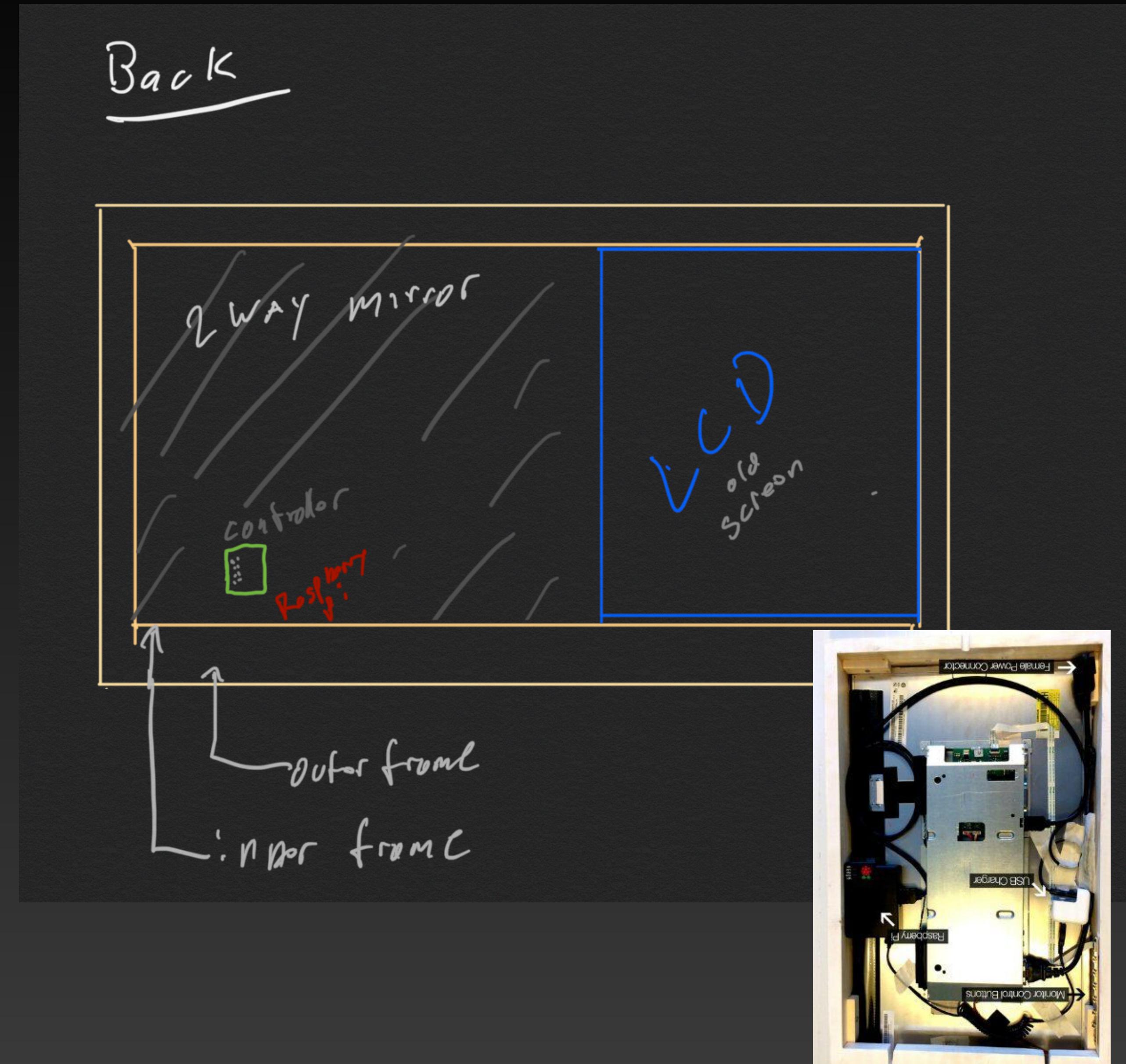
// LCD object with MRAA named pins
var lcd = new ili9341.ILI9341(31, 38, 20, 14);

// Parameters
var DEBUG = 1;
var OPENWEATHER_API_KEY = "74437411d57c5685298a96fe01ea98a8";
var LATITUDE = 40.015;
var LONGITUDE = -105.27;
var UNITS = "imperial";
var TEXT_COLOR = lcd.color565(0, 255, 255);
var LIGHT_THRESHOLD_HIGH = 0; // Amount of light needed to start LCD
var LIGHT_THRESHOLD_LOW = 0; // Amount of light needed to go to "sleep"
var WAIT_WEATHER = 20000; // Amount of time (ms) between weather updates
var WAIT_GESTURE = 200; // Amount of time (ms) between gesture updates
var STATE_CURRENT = 0; // Looking for current weather
var STATE_HOURLY = 1; // Get hourly forecast
var STATE_DAILY = 2; // Get 3 day forecast
```

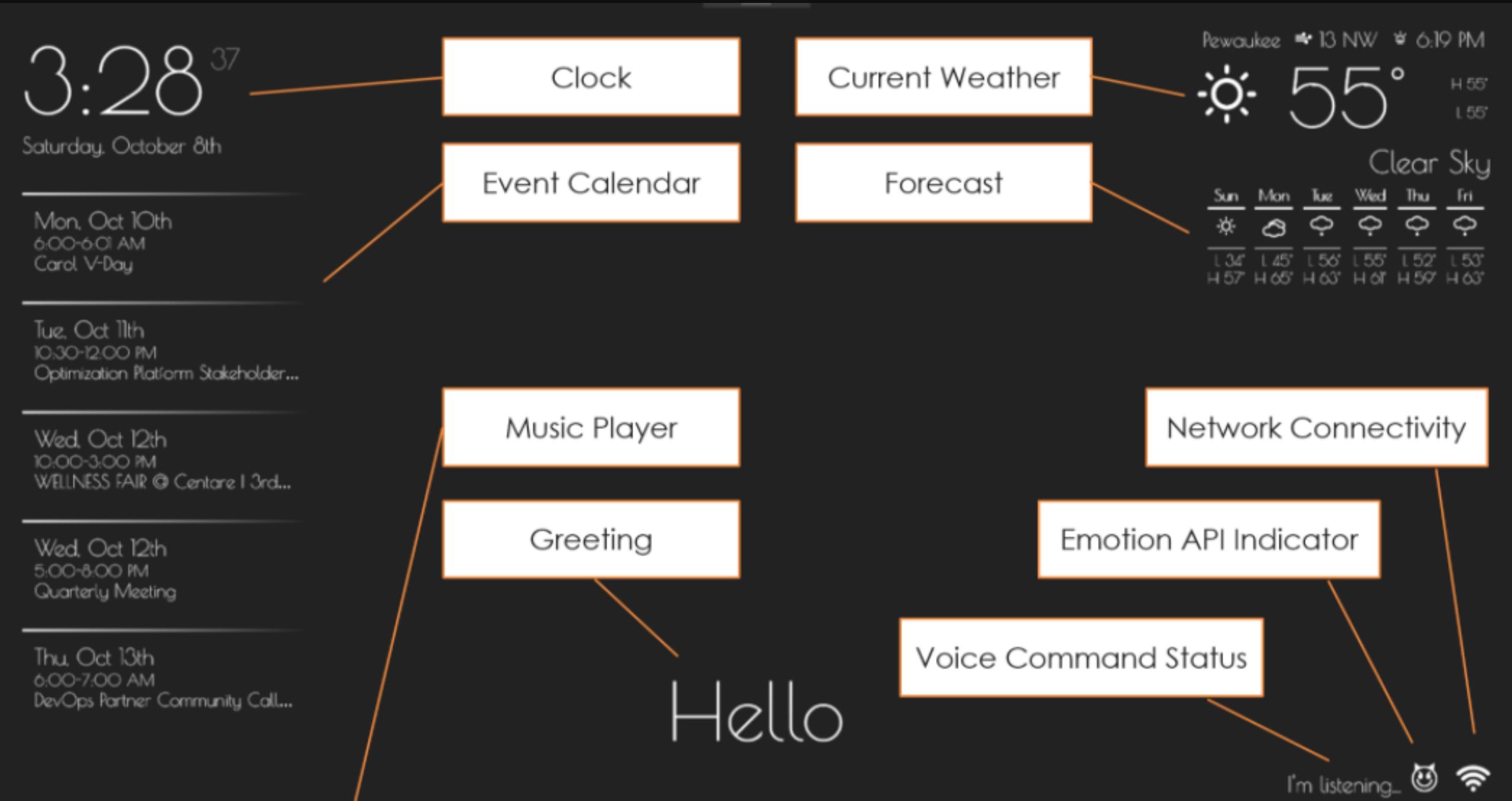


# Building the Device (Physical) (Freddy Lopez)

- The build will be simple enough
- A wood frame and inside we will have the raspberry Pi connections and the monitor mounted
- We can add more features as we progress in the design



# Building the Device (Software) (Freddy Lopez)



- Open software Magic Mirror as a reference guide
  - This will allow us to reference different coding templates
  - acquire certain display designs such as displaying the time, weather, or any additional widgets we decide to create
- We will have to figure out how to create a program that reads sensors to detect touch if necessary

# Function (Gang Shen)

- Voice Control integrating Alexa as our smart assistant
- Touch Screen
- Build-in AI
- Adjustable LED Lights as a decorative background



# Assigned work(Gang Shen)

Jairo Caballero

- Introducing the project, marketing the smart mirror to consumers
- Acquiring Physical Components / Materials
- Acquiring Software Components / Materials
- Coding with Morgan to customize and test different widgets

Morgan Lewis

- Applying code within the Raspberry PI Operating System to test different displays
- Building the software design

Gang Shen

- Soldering & assembling product
- Building the physical design

Fredy Lopez

- Painting / Embellishing the product once built
- Building the physical design

# Target Market (Morgan Lewis)

Smart mirrors are able to display the following widgets as examples::

- Time
- Weather
- Current day
- Calendar
- Most recent news headliners



Our target market is aimed towards those who would like to acquire more smart home technology. Furthermore, consumers who use smart devices such as Alexa and other smart home appliances would be more likely to add a smart mirror because of the integration along with other smart devices. From a consumer's perspective, what makes a home more attractive are connected devices within the home that communicate together through an integrated system that is secure, simple, and convenient.

# Conclusion (Morgan Lewis)

- As we progress with this project, we have plans to add more features such as additional home screen features and voice recognition.
- The building process itself is straightforward. We will be required to do some woodworking to adjust the frame and monitor. This will have to match in the appropriate size. Decorating our smart mirror would be the last thing to do. In addition, getting the parts to come in might take the longest time. To better anticipate the delay, we will be scheduling the purchase orders earlier to give us the time we need to build the design.
- Because we will be using cheaper materials such as the actual operating system, we would be able to supply this at a cheaper cost to consumers. The Raspberry Pi is a simpler operating system that can still provide the needed functions to operate.
- Overall, we tried to choose a project that would be challenging with both hardware and software. We will have to work as a team in all aspects of this project to provide our target consumer with a device that provides a beautiful display at a reasonable price. As engineers, this project will also help us gain some experience that may be applicable to use in the “real world.” Throughout this process, we will acquire additional skills that we can take with us as we progress through the class.

Thank You