Group 4 - *DrinkWizard*

Group Members:

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Sponsors:

- As of right now no sponsors.

Project Narrative

DrinkWizard came about for our love of all things alcohol related. Everyone loves having friends and family over for dinner or a big game but hates being stuck playing bartender. The *DrinkWizard* solves this dilemma for you. *DrinkWizard* will allow your guests to use our touch screen or mobile app to order their adult beverage of choice. *DrinkWizard* will store a minimum of nine liquor bottles. These bottles will have specific locations so levels can be monitored and alerts sent when levels are low. *DrinkWizard* will have a touch screen where users can first set up their user profile (a verification of age, thumb print scan, and an initial breathalyzer test), order drinks, and where the admin can monitor bottle levels. The thumbprint scanner is used to identify the user and prevent underage individuals from getting the drink, once the drink is picked up by the authorized user the responsibility is taken away from *DrinkWizard*. The breathalyzer will be used to periodically get users accurate blood alcohol level and advise the user on the effects of more drinks and their ability to drive.

Specifications

<u>Android Application</u>

The application itself should be no larger than 50 MB to allow it to fit on the internal or external memory of any device. When touching buttons, to select a drink for example, the app should respond to let the user know that a selection has been made. Data from which drink is selected should be sent to the mixer via a Bluetooth module. After all input has been entered, a display will show the user what stage their drink is in. Stages include, at least, one to signal in queue but not started, one to signal that the drink is being made, and one signal when the drink

is finished. Finally, the app should display an Android notification to let the user know when the drink has been finished. The admin's version will show how much liquid is left in each bottle. To monitor liquid levels, sensors will be attached to each bottle.

Power Supply

The power for our drink machine is going to be provided by a typical 3-prong 120V AC outlet. The 3-prong plug was chosen because its ground provides better protection against possible electrical fires. We will take the 120V AC and transform it to a DC voltage for the components in the *DrinkWizard.* The components needed for this power supply will be a transformer, the transformer will take the 120V AC from the main line and step it down to 20 volts DC. The next component will be a full-wave rectifier, this rectifier will take the AC voltage and transform it so the voltage no longer goes through a negative cycle. The output of the rectifier will be all positive voltage. The power supply will need a smoothing capacitor to smooth out the pulsating fluctuations from the rectifier. The power supply will need a voltage regulator, possibly part # LM317. This voltage regulator serves to further smooth out the fluctuating signal. A heat sink will be needed for the voltage regulator. This will give us a way to dissipate the heat otherwise this could damage or destroy our circuitry in the power supply. A capacitor will be needed to act as a load balancer. This will smooth out any fluctuations that may exist on the output of the regulator. These are the components that will make up the power supply for our *DrinkWizard*.

Physical Design

The dimensions of the base should be relatively compact so it can be portable, ideally less than 2ft by 2ft and made of some sort of acrylic or plastic. The optimal amount of different liquids it can handle will be 9. These 9 containers will have level monitoring systems to determine when the bottles are empty. The pouring end of the system will be designed to be spill-proof with the use of 2 proximity sensors, one horizontally to detect a cup, and the other vertically to sense when the cup is full to prevent overflow. Liquid flow control will be handled by food-grade peristaltic pumps.

Liquid Level

The liquid level control is still being researched but will monitor the voltage of a sensor embedded inside each liquid container. When the liquid drops below the sensor, the output voltage should change and set off a red led near the corresponding container that is empty.

Bluetooth module

Since our project does not include designing a cheaper or smaller Bluetooth adapter, The communication module will be some sort of booster pack implemented hardware for the MCU.

Breathalyzer

The tablet interface will include some sort of breathalyzer module that plugs into the usb port of our android tablet. This module will not be designed within our project scope and will be purchased complete with the intent of using the output to lock a user out of the tablet software with a failed breathalyzer test.

Cup Sensor

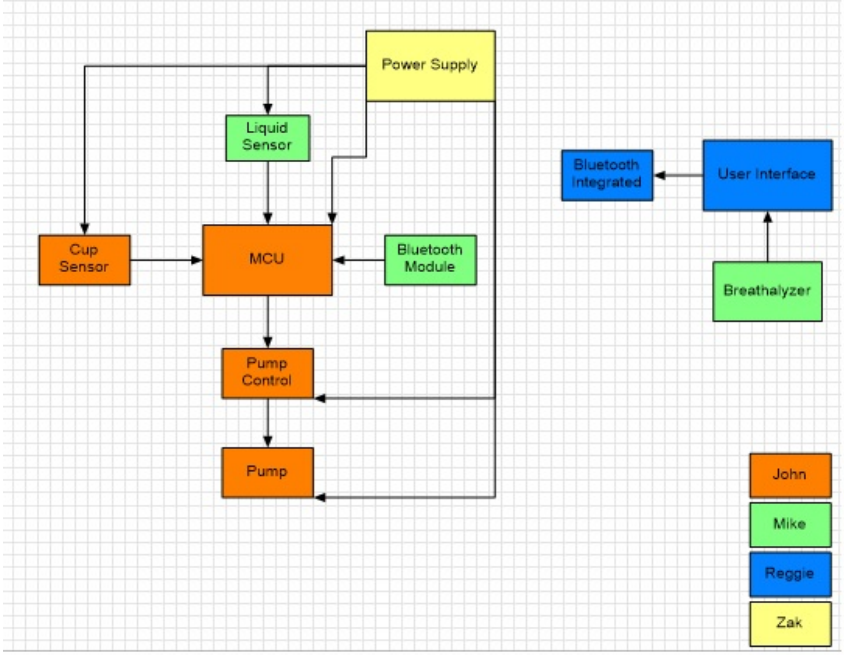
For this project, it is essential that we can detect whether a cup has been placed in the proper spot or if there is nothing there. This is key because we do not want to dispense liquid if there is no cup there. The cup sensors will detect the presence of a cup and will allow the machine to dispense the appropriate liquid into the cup. These sensors will most likely be ultrasonic distance sensors. The will detect if something has been placed into the dispensing area. To determine if this is a cup there will be ultrasonic sensors in both the x and y axis. This will help to eliminate dispensing when the item in the dispensing area is not a cup. This sensor will also determine if the correct amount of liquid has been dispensed into the cup and will prevent the cup from overflowing. However the cup must remain a constant in our design.

Pump & Pump control

Our project has to have a mechanical pump dispensing element. That element must be controlled. This will ensure that there is no errors in drink dispensing. This will be done with the use of the cup sensor and the pump. The pump will most likely be of the peristaltic type. This was chosen because of its accurate dispensing properties. This pump also does not have the liquid flow through the pump like most liquid pumps do.

MCU

This will be an embedded project. The chip will be a microcontroller. It must be able to handle the tasks of controlling at least 9 pumps and receiving data via Bluetooth. This will be the brain of our project and must do so flawlessly. This microcontroller will also be used to read the data coming from the cup sensors and be able to decipher that data into useful information. It must do this at a speed that will be fast enough to not hinder other operations of the project.



All blocks are currently except for the user interface are currently being researched. The user interface is being designed.

Project Budget and Financing

The initial cost of the project will be $150 per person. Barring any future sponsors, the entire project will be funded by the members of this group.

Milestones

By the end of the first semester (Spring 2015), a working application should be developed. It should be able to receive input from the user and store it. In the second semester (Summer 2015), focus will shift to refining minor details within the application and allowing it to communicate with the mixer.

Researching and testing of individual parts will be done this semester. During the second semester, the group will focus on integration and testing of the mixer as a whole.