LiquiFuze

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With: Ryan Ogilvie, Fitz Freeman, Yao Lu

Engineering Entrepreneurship and Technology Innovation
Instructor: Dr. Daily
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THE UNIVERSITY of
TULSA
Department of
Mechanical Engineering

Project Grading Checklist
Engineering Entrepreneurship and Technology Innovation

Create a binder with the following contents in the following order. The instructor will check off each page in your binder and assign the appropriate points for the class. Print this page and include it as your first page in your binder.

Name: Kelly Howell   Date: 12/5/17

Company Name: LiquiFuzz

| Page	Description	Points	Points Earned
	Pitch Slides		
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	Minimally Viable Product Demonstration 4 Report	40	
	Total:	600	600

LiquiFuze

Mixing So You Don't Have To

Team Members

- Ryan Ogilvie -co-founder, CEO, Head of Design
- Kelly Howell -co-founder, Head of Marketing
- Fitz Freeman -co-founder, Head of Manufacturing
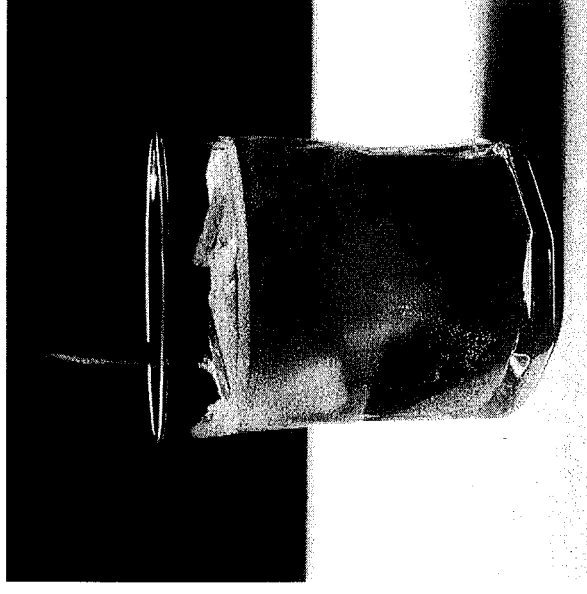- Yao Lu -co-founder, CFO

Problem

- Many businesses that serve drinks can often get backed up with orders during high traffic times

- Over pouring on drinks can be a common issue for drink serving businesses
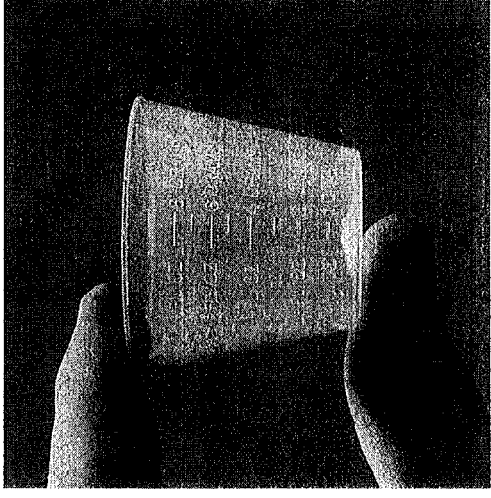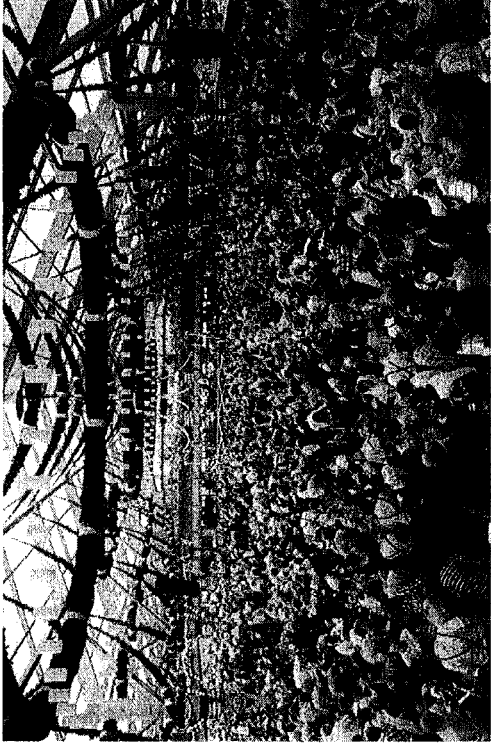
Value Proposition

- Efficiency
  - Save time, save money
- Consistency
  - Reduce drink waste, save money
  - Consistent taste
- Experience
 - Creative, new way for drinks to be made

Cost Value Breakdown

- Typical drinks served per week: ~ 450 drinks ($4,500)*
  - Typical drink cost ~$10 per drink
  - Peak days (Saturday + Friday): 120 drinks ($1,200) || Other days: 40 drinks: ($400)

- Cost of Supply: $2 per drink**
  - 10% loss from overpour/ lost product
  - Base supply cost per week - $900 || Adjusted Supply cost - $1000
  - Loss per week: $100 || per year $5,200

- Cost of Time: Minimum wage
  - 2 minutes to make each drink
  - 15 hours per week ~ $108
  - Savings $54 per week || per year ~$2800

- Overall savings per year
  - Estimated 50% reduction in product loss & time cost
  - Product loss savings: $2600, time savings: $1400

Overall Savings Per Year: $4000

http://ameriguardinsurance.com/wp-content/uploads/2017/08/Money.jpg

*Averaged from 4 interviews, **from Applebee's Interview
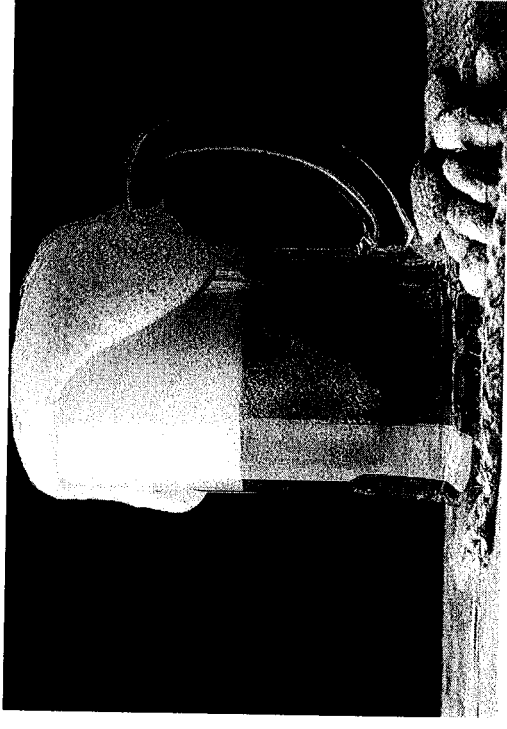
Lessons Learned #1

- High end bars do not want automated drinks
  - ○ People like high end drinks to be made with craft and care
  - ○ Patrons like to watch as the bartender makes their drink
  - ○ Bars like to sell the experience of a bartender
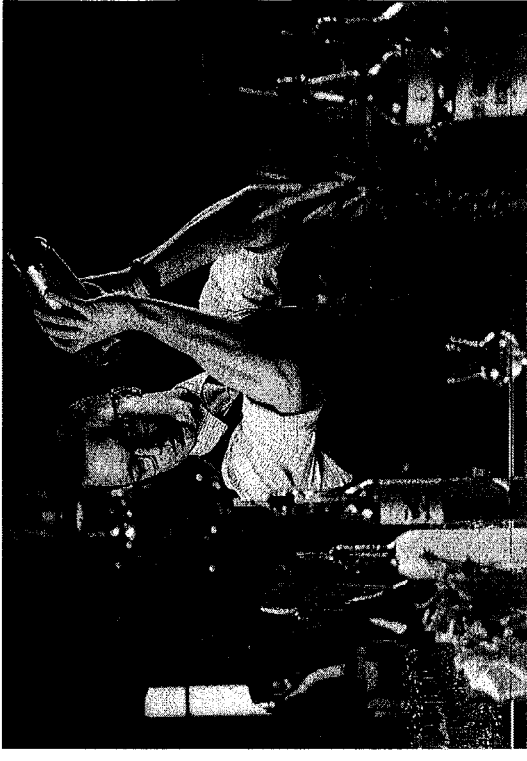
Lessons Learned #2

- This machine would not work for all types of alcohol
  - Pouring Beer would create a large head, thus wasting product
  - Also could allow for wine to go spoiled if not consumed immediately

https://nourish.schnucks.com/wp-content/uploads/2016/04/BeerPour4.jpg
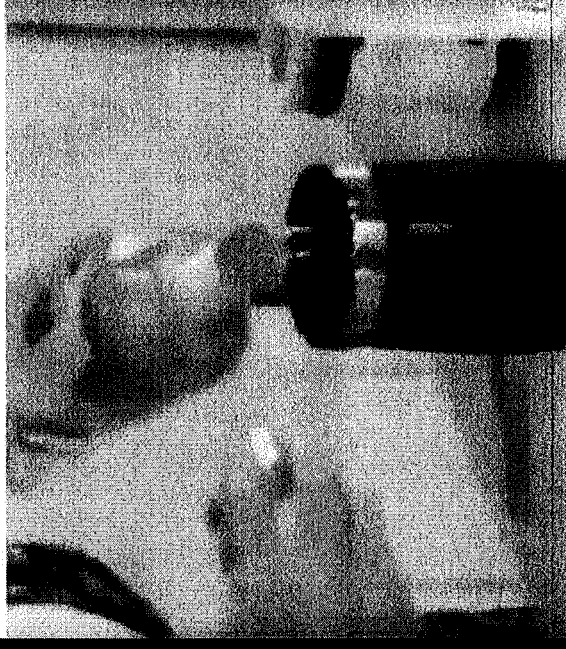
Lessons Learned #3

- Over Pouring drinks is an issue
  - Pouring to a count
  - Pouring into a jig (measuring cup)

When your alcoholic friend makes you a drink

Lessons Learned #4

- Alcohol is highly regulated, as well as food and drink safety
  - This would be a large barrier to entering the industry
  - Ensuring that the device was up to code on actually pouring drinks but as well as made of material that would be safe to be around consumable liquids
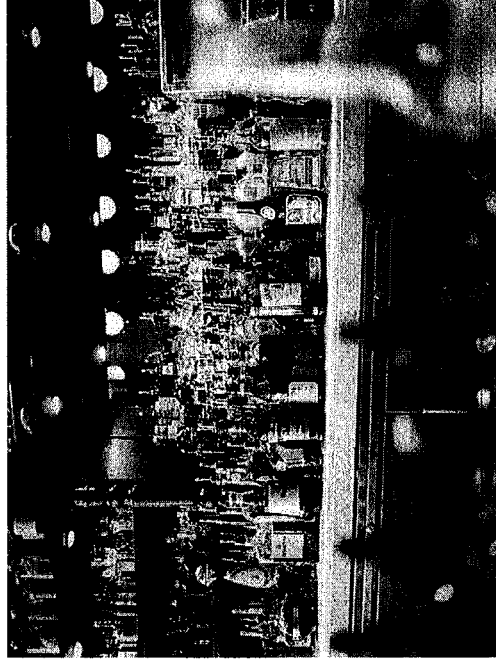
https://brokelyn.com/app/uploads/2017/04/alcoholic-beverages-1845295_960_720.jpg

Lessons Learned #5

- There are some products solely devoted to technology for pour accuracy

  o However, none of this technology came up in our interviews

  o Why don't companies use this technology? Will they use ours?

  o This also validates the issue of overpouring

Spout — Collar — Cork — Base

https://alcoholcontrols.com/posliqporspo.html

https://alcoholcontrols.com/eclicosy.html
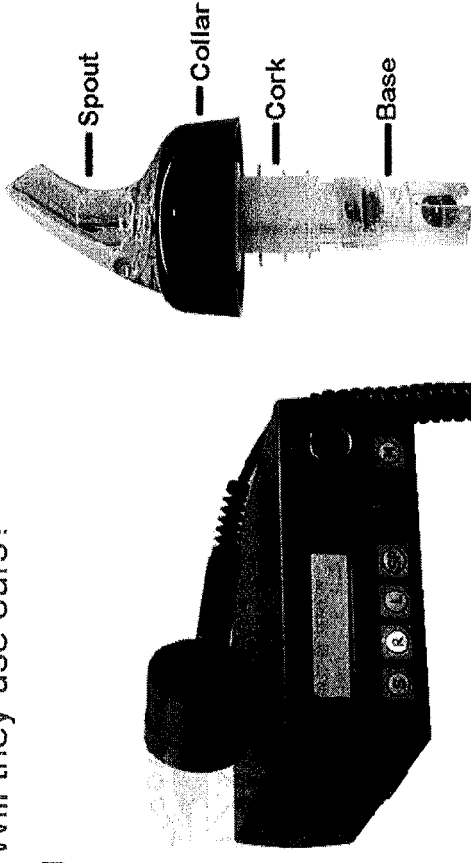
Our MVP Iterations

MVP #1: Functional system.
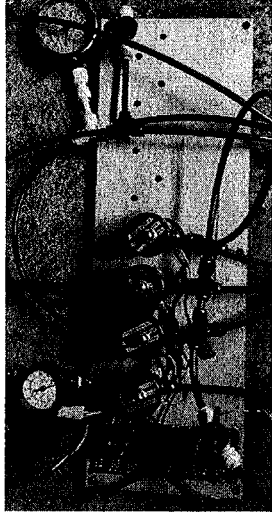
MVP #2: Box to house the Functional system

MVP #3: Box and Functional system combined.
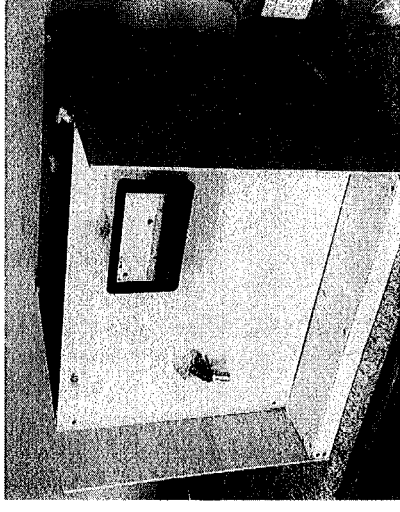
- MVP #4: System Improvements
  - Air line filter
  - Food grade solenoids
  - Water flush instead of air (drinks already 25% water)
  - Programming drink mixes

What's Next

- Dependent upon further investigation
  - More customer discovery in the chain restaurant, venue and industrial markets
- Continue working on logistic issues / implementing solutions
  - Flush line
  - Refrigeration
  - Possibility for liquor only device
- Get in contact with Food and Drug Agency

Questions?

The Business Model Canvas

Designed for: Drinkmaster

Designed by: Ryan Ogilvie, Fitz Freeman, Kelly Howell, Yao Lu

Date: 10/5/17

Version: 1

Key Partners

Alcohol Brands

Soda Brands

Food Suppliers

Manufacturing

Key Activities

Mix Drinks Quickly

Data Aquistion

Key Resources

Recipes

Machine Design

Cheaper

Value Propositions

Happiness

experience

Fun

Customer Relationships

Sell drinks

Display Machine

Advertise

Channels

Advertisement

Word of Mouth

Door to Door Pitches

Customer Segments

Bars

restaurants

Individual Customers

Cost Structure

Advertisement

R&D

Materials

Manufacturing

Legal

Accounting

Revenue Streams

Machine Sales

Data Information

Spare Parts

Drink Cartridges

Training

The Business Model Canvas

Key Partners

Alcohol Brands

Soda Brands

Food Suppliers

Manufacturing

Key Activities

Mix Drinks Quickly

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Mix accurately

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Venue Halls

Chemical Mixing Business

Cost Structure

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Materials

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Machine Sales

Data Information

Spare Parts

Drink Cartridges

Training

Strategyzer

strategyzer.com

The Business Model Canvas

Key Partners

Alcohol Brands

Soda Brands

Manufacturing

Key Activities

Mix Drinks and ingredients Quickly

Mix accurately

Data Aquistion

Key Resources

Recipes

Machine Design

Value Propositions

Efficiency

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Sell drinks

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Chemical Mixing Business

Airports

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Machine Sales

Data Information

Spare Parts

Drink Cartridges

Installation

The Business Model Canvas

Key Partners

Alcohol Brands

Soda Brands

FDA

Manufacturing

Key Activities

Mix Drinks and ingredients Quickly

Mix accurately

Data Aquistion

Key Resources

Recipes

Machine Design

User interface

Value Propositions

Efficiency

Consistency

Experience

Customer Relationships

Sell drinks

Display Machine

Channels

Advertisement

Word of Mouth

Door to Door Pitches

Customer Segments

Bars

Restaurants

Individual Customers

Chemical Mixing Business

Airports

Venue Halls

Cost Structure

Advertisement

R&D

Materials

Manufacturing

Legal

Accounting

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Machine Sales

Data Information

Spare Parts

Drink Cartridges

Installation

Strategyzer

strategyzer.com

Description and Justification of Key Partners:

Alcohol Brands: This partner is key to the business because the current design is to mix alcohol with mixers so partnering with an Alcohol brands would be beneficial to allow for our machine to be provided with alcohol. We were unable to validate this partner but plan for the business to progress it would be key to get in touch with alcohol brands to ensure that they would allow for their products to be used in our machine. But if these companies did not want to work with us it would not be a complete detriment to the company.

Soda brands: This partner is considered to be key partners because they are what is mixed in the the alcoholic drinks. Like the alcohol brand key partner soda brands were unvalidated because we were not able to get into contact with anyone in this area. But that does not change that they are a very important group to partner with because of they would have to allow for our machine to use their product. Just like with Alcohol brands if a soda brand was unwilling to work with LiquiFuze it would not be the end of LiquiFuze as a company.

FDA: This is the regulatory commission that our company would need to work with in order to ensure that our machine is safe to dispense consumable liquids. Many of our interviews mentioned cleaning is a problem. Our first demonstration in class Dr. Daily brought up the argument that our device may not be food safe as it was then. The interview with Kitchen 66 helped to validate that food safety is important and can be difficult with new devices that handle food. Without approval from the FDA this device cannot be sold.

A manufacturing partner: would be a very important to get figured out because if there is a dedicated manufacturer the price of the machines can be lowered and thus be more easily purchased. Costs contained in Appendix 2 of the MVP reports show that the cost is about $600 for this device which is relatively high. A manufacturing partner and suppliers could help bring these costs down. If a manufacturing partner could not be found because that would prevent us from moving to a space that can rapidly create the device for much cheaper than it is currently being done. So if a quality manufacturing partner could not be found that might spell the end of LiquiFuze.

Description and Validation of Key Activities:

Mixing Drinks and Ingredients Quickly: Mixing drinks quickly is a very important activity for LiquiFuze because that is the selling point of the brand. It can make these drinks quicker thus getting the drink into the hands of the customer quicker. This activity

simpler for bartenders. This was validated in an interview with a bartender who liked that it was easy and simple to work. In the interview with Chimera he was very impressed with the ease of use and that it was a touch screen.

Cost Structures in the BMC

Advertising: Advertising is vital for any new product in the market. It can range in expenses from being free, word of mouth, to millions of dollars, for advertising campaigns, superbowl ads, etc. Data and research also goes into advertising, and is another thing that will require purchasing. Advertising for startups should be quite strategic, and should target the most likely customers. Showing our product in an interview with the headquarters of a company will be a viable, cheap form of advertisement. Included in appendix 3 is more information about advertising costs.

R&D: In order to ensure that our product is the top of the line, and implementing product innovations, we need to have research and development. There are a lot of complex parts in the LiquiFuze machine, and some can probably be done better, hiring a dedicated team of individuals could help solve this problem, as well as help innovate new features in the future.

Materials: Procuring materials for the device will become easier as production increases. Currently each device will most likely be built to order by hand for customers. The cost of the materials will be about ⅓ of the upfront cost of the machine. When creating our MVPs we accrued a cost of about $500 building one machine. See Appendix 2 at the end of the MVP report section for the bill of materials.

Manufacturing: Manufacturing costs will become a big cost structure once production increases. The embedded system setup, wiring, and circuit work will all need to be standardized and efficiency of production maximised. It was estimated when creating our MVP that it was $60 in labor costs using $10/hr as a basis. See Appendix 2 at the end of the MVP report section for the Labor cost estimates.

Legal: Any alcohol related product is going to have some legal resistance to it. There is a lot of liability in making a mixed drink for a customer. Being held liable if the machine makes someone sick, for instance, could kill the machine's potential. Another potential downfall would be a customer claiming the machine does not perform like it should. Good legal protection will help ensure safety from most potential issues. Also help with a legal team can help establish liability between the bars and LIquiFuze. This is idea was validated in our last MVP presentation. Also

experiences, which consumers invest in all the time. Interacting with a touch-screen user interface and seeing various liquids pour into a cup in an automated manner when normally they are poured out of a bottle is a novel experience that consumers would be willing to invest in as well. In an interview with a bartender it he made the remark that the this was an interesting way to have drinks made and could see customers finding it unique. Another interview with a drink connoisseur also talked about how we could create a neat experience for consumers in their homes.

Customer Relationships BMC

Sell Drinks: Customers who buy this machine will sell drinks to consumers. Though some people might buy a LiquiFuze for themselves, the majority of the market will likely be restaurants, who want to move product faster, and will use our machine to do so. Applebees was the most likely type of restaurant to adapt the LiquiFuze to their services based on the interviews conducted. Some drinks such as a Long Island Iced Tea are made up of many different ingredients, and therefore take awhile to make. Other places such as the restaurant at the airport have a unique situation where they have a small window to get drinks out to people. When customers see a big line at the bar at the airport, they are less likely to get in line.

Display Machines: Customers will display our machine when they use it. When customers make drinks for consumers, they are showing off the machine. This will help spread the word about the LiquiFuze machine. In each of the restaurants and bars that we went to, it was clear that all of the drinks were made at the bar area, which is open and people are able to see it. All of the places that we interviewed at discussed how bartenders with the customer is important, so once customers get their drinks, conversations about the device could come up.

Channels in the BMC

Advertisement: Advertisements include social media, TV and etc. Because we see so many advertisements everywhere. So a way of getting LiquiFuze out into the market may be through making advertisements. So making this assumption about advertisement, we need to have some interviews with a marketing manager to validate our assumption.

Word of Mouth: In my opinion, Word of Mouth is the most efficient way among these three. Because the word of mouth is the most true feedback from our customers, and if the product is good, our customers could be the advertisers for our products, and it's free. Also our potential

Venue Halls: In our assumption, we think Venue Halls can be a good customer segment for our product. Especially the party venue, demand of drinks increase in a short period of time. So we think having a couple interviews with companies that rent out venue halls to know more about this segment would be valuable. This assumption has not been validated but is still a potentially viable avenue to explore.

Airport: We added airport sto the list, because when I did the interview at Atlanta Airport, at Umaizushi Bistro Bar located at Terminal C, they had an interest in our machine. Customers at the airport will not stay for very long and there are always lots of people, so the servers are very busy during that time. Our machine can save time making the drink for the customers.

Revenue Streams in the BMC

Machine Sales: Obvious, Machine Sales is most of the Revenue Stream comes from. As we our assumptions, machine sales increase 3 per month. After couple months, we reach break-even point. From our research, most of real-products companies sell their products as most of their revenue. For example, food is the products of the restaurants, so as our products.

Data Information: The data information include the data for mixing drink, we may corporate with some website for recipes, we may sell the new drink data to the website, or find drink data from them, which is also a kind of advertisement. Suggested from demonstration in class. This could add a way of including long term revenue by selling this service as a subscription.

Spare Parts: Spare parts include compressor, Air Tank, Pressure Regulator, Liquid Tank, Solenoid and Spout. Because even our machine is easy to use, but the inside of machine is complex. So if the spare parts have some problems, we will provide the service for replacement. But our interviews did not include any companies to make, but spare parts are still a valuable part for us to validate.

Drink Cartridges: For example, coffee machine has coffee pod. So we made an assumption about Drink Cartridges also could be part of our Revenue streams, which we need to validate in our interviews. Suggested in both demonstrations in class. This is a way of potentially making a patentable technology. Creating drink cartridges specifically for our machine would also introduce a method of long term revenue.

Installation: We replaced Training to installation, which because after our first MVP, we find out our machine is big but easy to use, so we removed Training for Revenue Stream. Because from

Introduction: Hello I am a student at TU we are working on a class project, if you have time, could we talk to a bartender/ manager/yourself and learn how you make drinks. It should take about 10-15 minutes. If you are busy could we do an alternate time:

Question Set 1 - initial questions

1. What is the cost structure of the restaurant?
2. Except food and drinks, what can you provide customers?
3. What are the advantages of your business compared to nearby businesses?
4. How many drinks are sold daily?
5. Are you willing to buy a juice/drink mixer, why or why not?
6. If yes - What functions would you want the machine to have?
7. Do customers order drinks or food the most? Which is easier to sell?
8. What aspects of the machine would stop you from buying it / using it?

Question set 2 for bartenders

1) Common Drinks, types, and amount
2) Process from ordering to getting to the customer
3) Issues and problems with making drinks and doing your job. Is there anything you would change.
4) What roles does the bartender have + what is the purpose of the bartender at this establishment
5) Introduce product and talk about it. Ask if they would be interested. Then ask if they would buy it. If not, ask why

Question set 3 for Enthusiasts

1. How often do you make drinks at home?
2. How often do you go out for drinks instead of making them at home?
3. What are reasons you make drinks at home instead of going out? And Vice Versa

Question set 4 - Restaurants/Venues

1. Where does the majority of your revenue come from?
2. How many drinks do you sell within a week / daily?
3. What are issues you face when making drinks for customers?
4. What roles do you as a bartender, or does your bartender play in the customer's experience?
5. After introducing the idea of our project, what would you change about this product? Would you adopt technology for making drinks?

All abt Cha — Joaquin

- Cha is korea   first came to Texas
    —cha = all about coffee
- 25% of their products → food cost, 55-30% labor
    rental cost = 10%

Service, location are important
    They sell 100-200 cups/day →
    —higher drink profits than food

For Cha— stores must contact Manager.
    —rental ownership
    —college students often
- very different for Alcoholic environment
    —They don't sell alcohol here

Soda machine in Korea
    —no machine here,
    hand made
    hand ground coffee
    — people like it like this

Cha would not adopt
    —interior design predetermined → machine would not fit.
    —Brand names are important
    —Fixed & spec. Machines / Brands by headquarters

They sell good quality tea
    food = sushi / sandwiches.

Bartender - Ben

- Works @ Valkyrie
  - Classic cocktails - fancy
  - Visualization of drinks, → appearance = Key
They make syrups in house - simple, fruit, etc.
  - Juices too
Dive bars use machines to do it

          Works for about 6mos
- Bartenders provide ambiance
Training)
  Time to be proficient depends on Background
    - most difficult part? → shaking cocktails

Bar kept clean
  50-100 bottles of liquor a week
Liquor distributors favor Casinos i not small bars.

- People Suck → order Shaken Martinis LTC James Bond dtls
need ppl skills
- Prioritize customers

Ben works his own bar
  - his ideal bar
  + everything in reach in a small camper van
  + Booth

Speed well - no bottles - close by
  Forgets drink ingredients

Straw test drinks for taste

10 wk training
  - technique, tech mixing, flavors
  - Practice workshops
10 drinks per tablet
- Customer to bartender attended } Important qualities
- drink quality
- Cleanliness
- atmosphere

Drinks are 25% by the end of the process

Ramos Gin Fizz - worst drink to make

Contacts for the colours, YOKO etc.
- likes product → not for valk.

Justin Moore

- 2-3 drinks a week
    Simple, cheap
    Gin & tonic / moscow mule

Pro: expensive to buy bottles
    goes out once a wk usually
Gets more complex drinks out
Loves Valkyrie
Good exp: Bartender makes it personal, friendly th.
~~th~~

worst: ~~Ignored~~, waited for a long time
    - Memphis - hotel memphis
- wants drinks quicker

He does like to see his drink made @ bar.
Wouldn't care if he was @ a table @ restaurant.

- would care if it made complex drinks even
- wants smaller liquor sizes
- would like to make different drinks
- makes drinks for others sometimes

Most friends take a beer
- having right stuff for people is hard
- I would need a fully stocked bar

Tries a new cocktail every 1-2 months or so.

Likes the product
    - does enjoy making drinks
    - doesn't normally have supplies

If he don't have to buy alcohol bottles

- fun thought: Jarvis (Iron Man) for a drink machine.

Speaks to you, makes drink

Layla Mortadha
- Works @ Tavern
    - 5 months
    - Waitress in training
- does meal prep work
    - change menus, fix ice machine
    - chops herbs

- She can choose when to start training
- McNellie Group
- important to interact w/ customers

Process: Drinks → appetizers → meal
- expedite process
- system for recognizing progress of the meal
Dirty silverware
- Bread service
typically 2 drinks/table
            mixed

Bartender gets backed up on some nights
    - works every day → gets tired

Our device:
    - Could give authenticity problems
        - if consistent could use for tables

dispenser pen → Starbucks syrup dispenser

other plans → determine if steak is correct temp
        @ easy temp

Host Problems
- Crowded Restaurant
- Annoying Customers
Food piles up
Food gets dropped, Serves get annoyed
extensive time collection → confirm
Ball in Alley connected to Tavern
- both restaurant has their own cooks

Dispenser
- Stops measuring time
- Does Syrups
- Premix common drinks

- Non-Profit
- Space + Money drove desire to be a non-profit
- Starting Capital coming from foundations
- Not worrying about making money for shareholders

- How to get interviews?
    - Restaurants — show up @ dead time
        - show we're students, Don't expect a meeting there
            - business card for manager
            - email from there
            - Be specific
            - Make it clear you aren't trying to sell it.

- On getting money.
    - start out w/ feedback
    - question formula
        (- how many drinks do you try to serve? etc.
        └ form questions to answer value prop sections
            - Pain points etc.
    - Want someone to have a negative emotional experience
        to get them to buy something from you
        - "I'm gonna lose my job if I don't fix this" etc.

    - focus on their problems mostly
        - quantify savings — save 30 seconds / drink etc.
        - how many care about how strong drinks are?
            - are they losing money by wasting products?
            - getting exactly 1 shot of this etc.
        -

Kitchen 66 – 10th ? Detroit
- Business incubator for food businesses
- 36° for food.

Make device easy to use
- hard to train – Major pain

Dustin's Opinion
- what is the purpose of the bartender at a restaurant?
  - why not just a waiter?
  - why would you want to replace a bartender.
  ask 5 levels of why?
  find all the arguments against using the device

Robby
- just go in and talk to them.
have a very structured interview
  - quantified / set questions.
15 mins or less for interviews.

Alex - Prairie

1) Jack i Coke → gets fancy
   80% Beer mainly
   Busiest night - 100 beers minimum
   30-40 mixed drinks
   = 4 to 5 bartenders

2) Greet customer - ask Q's - figure out
   - what they want - help if they have Q's
     - some people are stubborn
     - help them get their drink

3) Close Minded people
   - hateful / conceited
   ~~anything~~ to change how you make drinks!
   - loell, 4-5 people @ once gets crowded
   - Big area, lots of walking
   ~~Bumping~~ into people

4) Roles
   - ensure people have a good time / learn something
     - Share Knowledge
       - a lot come in just for food

5) Bartending has been around for so long
   - chat w/ bartender
   - ~~talk~~ talk to random people
   - enjoy building cocktails
     - it's an art
       - Can use as / an escape
   - Prairie would not / implement
     - people enjoy / make drinks
       - make new / drinks.

just did basic drinks
- vodka soda etc.
- could give time to talk to people
- people are focusing on efficiency

Chase

1) weekends - busiest
   Vodka Soda
   Moscow Mules
   ? Tyes of beers
   $2-5k in sales   1/3 is liquor + Beer

2) Bar
   - 2 distributors for drinks
   - shows up quick to door
   - bottles are weighted to ensure all of it is there
   - price point vs. amount of alcohol

3) Issues / problems
   - if someone is already drunk etc.
   - doesn't get too wild here.
   - rushes
   - running out of surplus
   - could make almost all mixers
   - people sometimes want stuff they don't have
   - can get chaotic @ bar when busy
     - flow

4) Changes / Bartender roles
   - update menus - add new cocktails - they draw their menu
     - by vote
   - note sales
   - don't carry ultra popular liquors - basic stuff
   - liquers can also be scarce

   - make fresh juices / mixes, bulk prep
     - keeping things fresh
     - knowing how stuff tastes to help customer

Keeping things stocked / clean
Social
    - talk people up etc.

5) opinions?
- sounds awesome for more volume businesses
    - super convenient - cutting drink prep time down?
    - adopt? - would have to talk to managers
    - having most popular drinks available
        - pushing it on the decision makers
- not having more suggestions

Robby
- Regulations are an issue
- Abc commission
   - see what they're looking for
- EPC utensils
   - Coffee shops automating pour overs
- Shaker skills, very - mimicing his movements

K66 = food → different than alcohol
   - Startup space for food, people w/ an idea
   - mobile / manufacturing license ≈ $1K
   helps absorb the risk
   - people who make food > machines
      - food trucks / Restaurants
      - helping a couple up manufacturing

- health, cross contamination
- alcohol is operated under two different offices

- Noah Bush — Hodges Bend / Saturn Room
   Noah @ hodgesbend.com

- Food product issues
   - Kombucha - new prod'n - hard to monitor fermentation
      - people don't know how to handle the equipment
- hardest thing for new products
   - getting push back - people don't know how to deal
   w/ new products

- K66 ≈ 1.5 yrs old

Pophorne, K gusto

Cafe + Retail store ! online store
- on sale products

Sugar products / mixing components
enk
Chillis + apple lores.
- learn from Valkyrie - what drinks they hate to
  make.
  - ~~let~~ give them time to make what they want to make.

- product validation
  - small scale tests - find successes } failures
  - lean startup → view your product as an experiment

Barnsdall - Gail

10 people per night
  - higher after UnCO, football
  - usually pretty slow

- mostly sell beer,
    2 types on tap
    - people drink cheap beer
      - cant afford cocktails
  - whiskey is common
    - Jack & coke, moscow mule, Red bull vodka

People are usually friendly
  Mainly come to play pool, hangout
  dont sit @ bar often
    - Bar is never backed up
    low traffic

Bartenders not formally trained → on spot training
  - important to be kind to people, keep them coming!

Like our product
  "very cool!"
- thinks it could be profitable
- would save time
- scared of cost of device

- Savings on time probably not worth it for
  this bar,

- would not buy

Scanned by CamScanner

Applebees

1) Cost Structure
   - Set up by the Corporation + prices in computer
     Long Island Ict.
       3 liquors @ 3oz, $3.50 for it
   $2.13/hr
       ↳ if < $7.50/hr, apple bees compensates.
       if they make more, only get 2.13/hr.
   10% goes to bartender
       — doesn't go to hourly rate
   typically 20%-40% of total check.

   250-500 drinks / week
       - Sales promotions increase sales
   low bar cost @ this applebees.
   - don't outside hire for bartending.

   Bar can get backed up on certain nights
       - 2 mins. per drink to table.

   machine good for patrons not @ a bar

   minus Fri — Sat, majority of drinks go to tables.
       PPa → they want check to be above 15.50
               per person.

   They want drinks to go outside the bar

       our machine → 8 bottles @ a time.
       — would need to get high traffic materials
             in machine.

Most bottles have pour spouts - could make

Would A-bars adopt?
- they tryout stuff.
- lose power to building
- (Don't lose power often)

- keep machine just to alcohol
- Overpouring is an issue.
- PH drinking it is an issue.
- machine controls alcohol pours
- maintenance could be lower if you didn't use syrups and sodas etc.

add a flush line to spigot.

main line
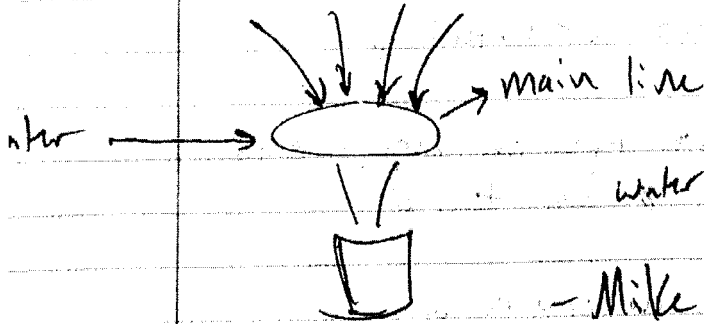
water

water is not a problem into in drinks

- Mike Nigel   or Thurs, Fri Sat
- Bartender Tues @ 4 pm

how much would this pay?

Beer lines run through whole building

how much people lose on a bottle from overpour
dollar amount ~ $1000s?
using jigger pour & count method
human error.

MVP #1: Report and Demonstrations:

Description:

The first MVP was a working prototype without anything to contain it all. This MVP tested to see if we could even make a device that works before going further. Figure 1 is the main part of MVP 1 with the exception of the bottles (shown in Figure 2) and the raspberry PI screen. The code for the raspberry PI is contained in appendix 1. And the for these components are contained in Appendix 2.
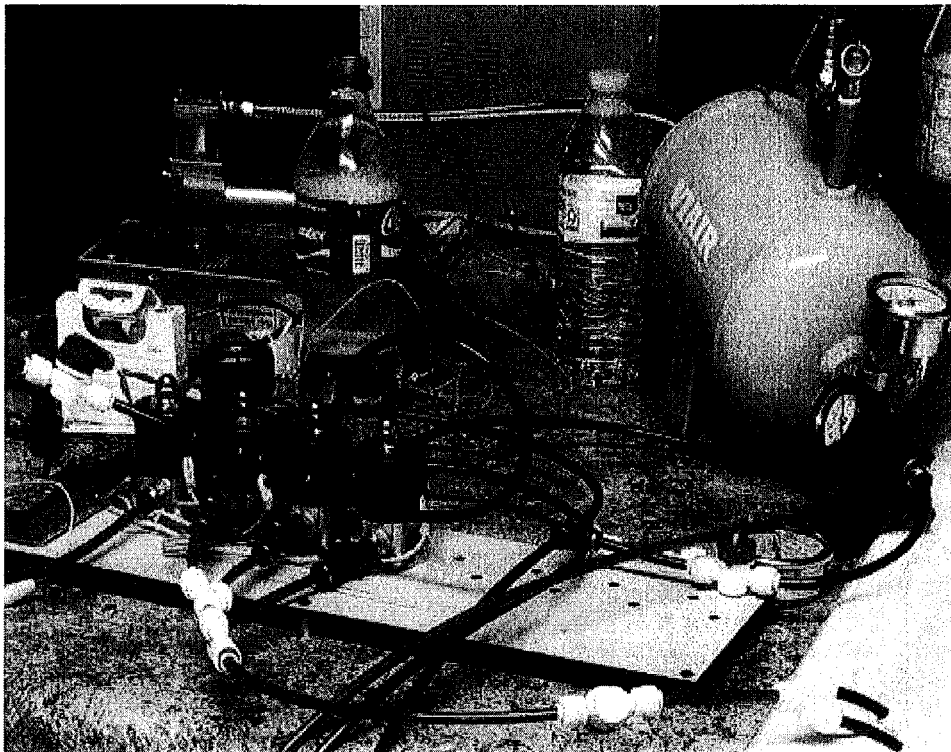

Figure 1: MVP #1 overall system

How it works:

Air is compressed and stored in a tank which pressurizes the liquid containers. You can see in Figure 2 there are two lines, air pressure in that stops at the top of the bottle. And liquid out that goes to the bottom of the bottle. For the prototype 2 liter bottle caps were drilled to make room for the lines and glue was used to seal them. The pressure pushes the liquids to the solenoids. A control system, the raspberry pi computer controls turning on and off these solenoids to mix the appropriate amount. In this version, after the mix is done, air pressure is run through the lines to clean them out. Timing is able to be accurately used because the and liquid levels are insignificant to overall pressure. Therefore a set time will always output the right amount of liquid. Figure 3 shows a diagram of how one line of fluid is sent to the cup.
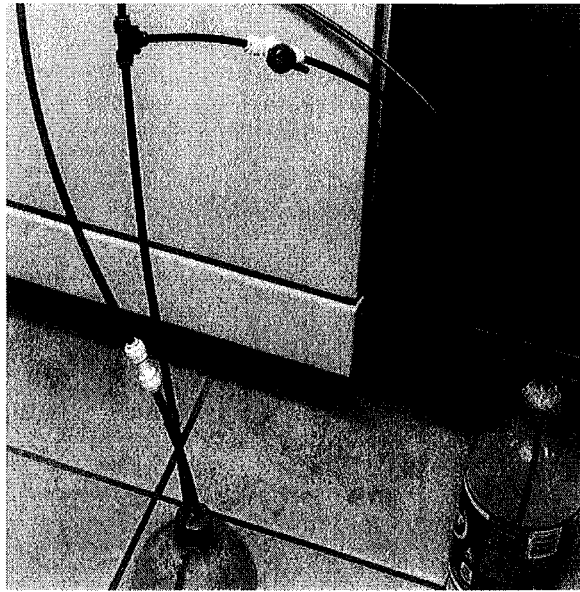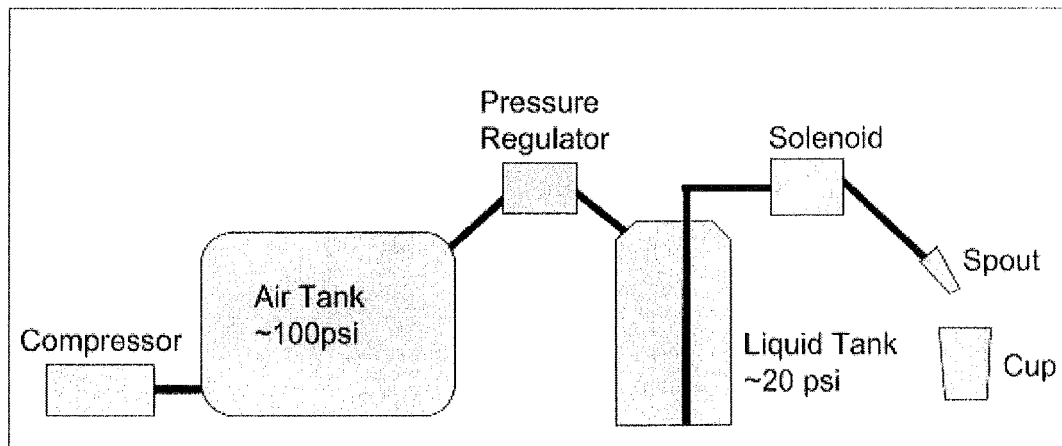
Figure 2:Bottle attachment

Figure 3: Diagram of System

Key Features to test:
- Ability to output liquids at the correct amount
  - Done with air pressure + timing
- Ability to select the liquids you want to output
  - Done with raspberry PI- code in Appendix 1
- Ability to avoid mixed liquids between pours
  - Done with air pressure flush (problematic, fixed in later iterations)

Demonstration

- <u>Location:</u> University of Tulsa Entrepreneurship and Technology Innovation Class

- <u>Attendance:</u> Teammates, Classmates, Dr. Daily
- <u>About:</u> The MVP how it was pictured in Figure 1 was taken to class and shown as part of the demonstration. During this demonstration we showed how you could select on the raspberry PI the amount of liquid you wanted to pour and it would pour it out.
- <u>Thoughts + Recommendations:</u>
    - Impressed by fully functional device
    - Add Air line filter to avoid contaminants getting in the drink
    - Look into food and drug administration to see requirements on food safety we would need to address.
    - Look into other non-alcoholic drink markets to see if they would buy it
    - Try to find an idea in the device you can patent and patent it.
    - Suggested making a box for portability

Conclusion and next steps:

The product as it is is not marketable or showable to people who would potentially buy it. We need to make a box to show what the product might look like in the end and put the product in their. Also FDA might have problems with the device since it handles food therefore steps need to be taken to ensure food safety. Also a conversation with the FDA needs to held in order to determine what it would take to get this product approved. Lastly, we need to look into other viable options for this product besides drink mixing since at the essence it is a liquid mixer and could be used for other things like chemicals.

MVP #2: Report and Demonstrations:

Description:

MVP #2 is focused on showing the customer what the final device could potentially look like. This MVP is just the box that will later contain all the components from MVP #1 to make it work. This was used as a visual in order to show potential customers the idea instead of showing a bunch of wires and flow lines. Figure 4 shows the picture we showed the customers in during our interviews to demonstrate what the device looks like and device at the end of the interview. This device was initially marketed as a catch all drink mixer which we changed later according to interviews and feasibility.
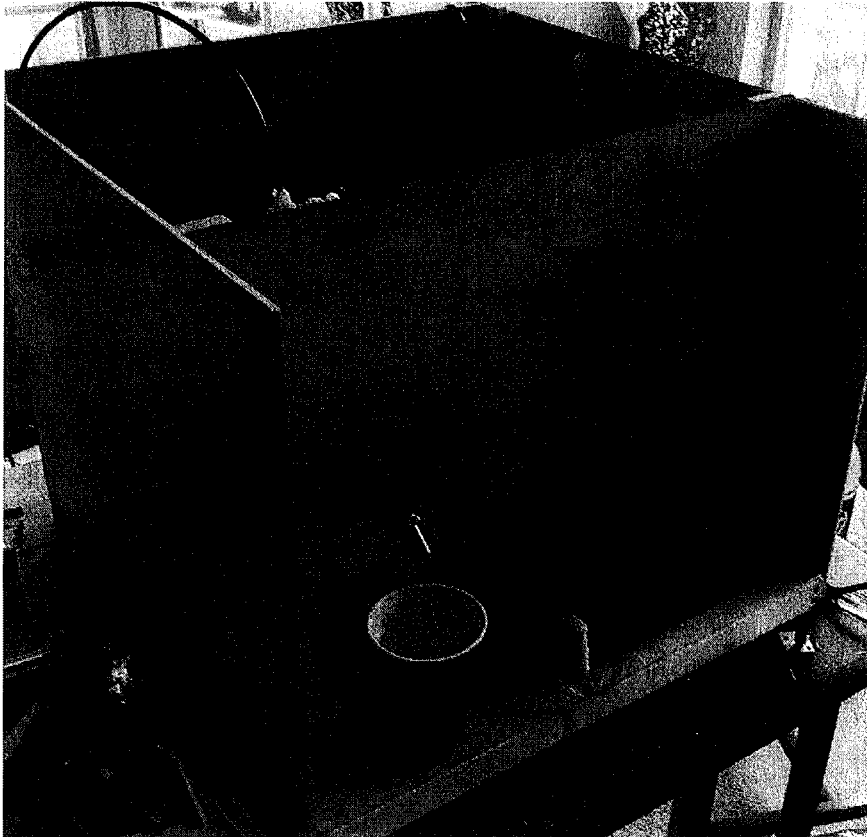

Figure 4: Case for Liquid Mixer

Key Features to test:
- Device meet customer needs
  - One device would give many types of drinks
- Device appeal to consumer
  - Easy interface with raspberry PI and single output spout.

Demonstration 1:

- Location: Prairie Brewpub
- Attendance: Teammates + Alex (bartender)
- About: Showed her the picture of the device in Figure 3. Asked what she thought of it and if they would buy it
- Thoughts + Recommendations:
  - Prairie would not implement as is - It takes away from the bartending
  - Suggested to do simple drinks in order to alleviate rush times and cut down on extra bartenders.

Demonstration 2:

- Location: Chimera
- Attendance: Teammates + Austin (bartender) and 2nd bartender
- About: Showed them the picture of the device in Figure 3. Asked what they thought of it and if they would buy it
- Thoughts + Recommendations:
  - Austin said he would suggest it to management if we made it.
  - Other bartender wasn't as interested
  - They suggested it could be just used for basic drink mixes that they don't like making.

Conclusion and next steps:

It would not be feasible to make every drink because the basic stock of mixes in a well could be as many as 100 not counting special ingredients. Also, both demonstrations mentioned the pain of making basic drinks instead of more complicated ones. So the MVP further on would be marketed to do basic or common drinks that would normally take away a lot of unnecessary time from the bartender. However marketing this as a drink mixer is feasible and a valid assumption that certain bartenders might adopt. The more casual bars might adopt this, however, high end bars and beer pubs may not be as interested because it takes away from the experience or is unnecessary. Austin from chimera helped validate the casual bar as a potential customer for our device.

MVP #3: Report and Demonstrations:

Description:

MVP #3 combines MVP #2 and MVP #1 in a complete functional product. This can be better demonstrated to customers to see what they think of how it works. This product has the combined working fluid systems and a box to make it look good and marketable. Figure 5 is the picture we showed the at the demonstrations. Figure 6 is a picture of how the bottles are attached in the back of the machine. These bottles are simply screwed on and the valve is opened to pressurize them.
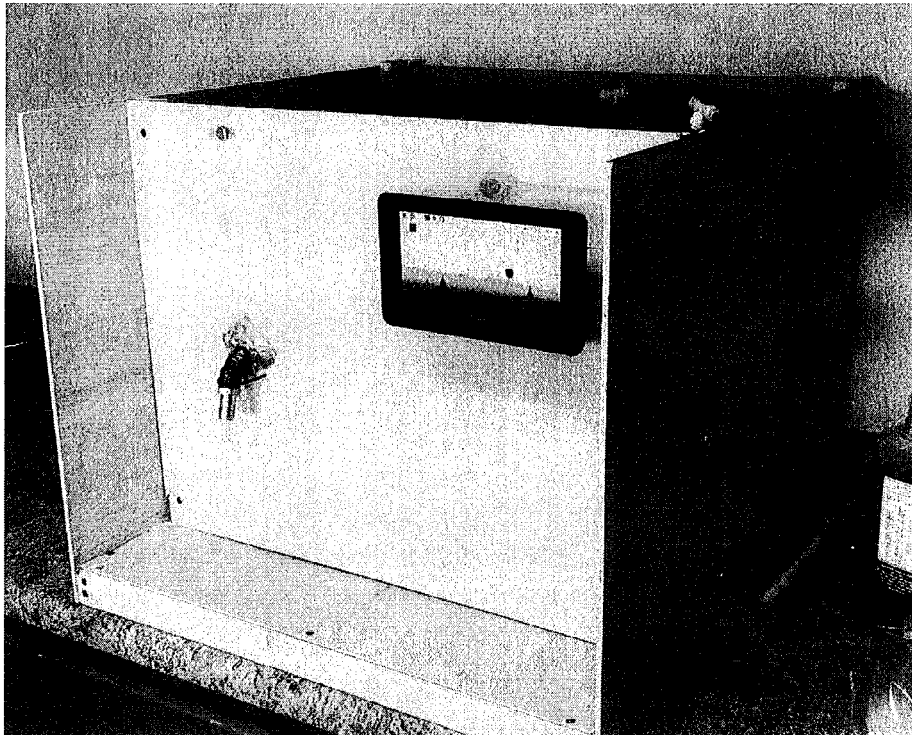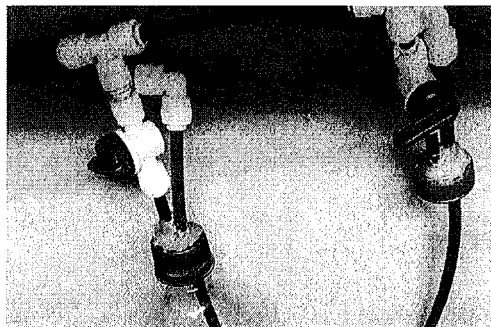

Figure 5: First complete product

Figure 6: bottle attachment points

Key Features to test:

- Devices functions as expected
    - Screen properly dispenses liquid.
- Device fully working can be sold
    - Will a drink mixer be desired?

Demonstration 1:

- <u>Location:</u> Applebee's
- <u>Attendance:</u> Teammates + Greg(manager)
- <u>About:</u> Showed him the picture of the device in Figure 4. Asked what he thought of it and if he would buy it.
- <u>Thoughts + Recommendations:</u>
    - Run a liquid flush line instead of and air line to flush the system
    - Would have to fly to North Carolina to try and sell it, he couldn't say yes or no
    - Cost is lost in over pouring and shortages.
    - We could make it so it only dispenses liquors so syrup lines don't have to be cleaned.
    - It could work as just a single type of complex drink machine for specials on drinks

Conclusion + Next Steps:

This device can now be marketed in its current state. The manager at applebees had a lot of good comments and potential uses for the device in his restaurant. This has helped validate casual restaurant chains as a potential customer, however this customer cannot be fully validated until speaking with headquarters. Also the flush line should be switched to water not air. This would help to completely clear out the system where air cannot. It would also not matter since a large percentage of the drink ends up being melted water anyways. Lastly, it has been considered that we switch to liquors only or very specific special drinks. This could help make our product more marketable in its current state.

MVP #4: Report and Demonstrations:

Description:

MVP #4 is an improvement on the previous MVP's. While the previous MVP's were focused on just making it marketable based on suggestion, This iteration is solely devoted to improving the devices functionality based on feedback. It also finally adds the mixing feature selection in Figure 9 which was not previously added. Before it just had single liquid outputs at a time. Figure 7 shows the switch to plastic solenoids which are food grade. You can see the original in Figure 1. Figure 8 is the air line filter added to reduce/ eliminate contaminants in the air line. Figure 9 shows the what the user sees on the output screen the complete code is located in Appendix 1. Lastly, in this iteration, the air flush line is replaced with a water flush line as suggested by one of our interviews. The final bill of materials was assembled and determined the cost to be about $500 for parts. This is located in Appendix 2.
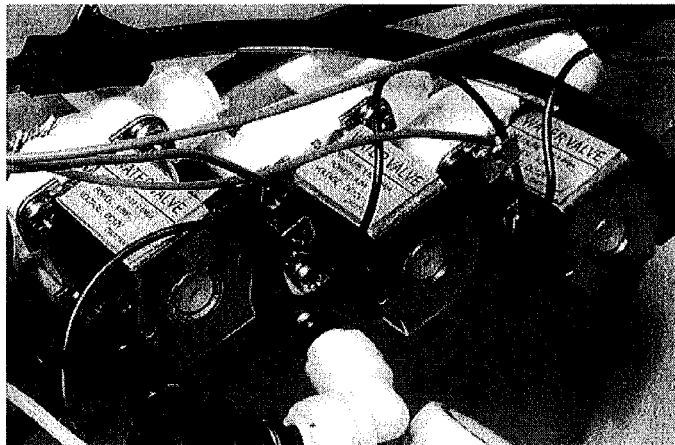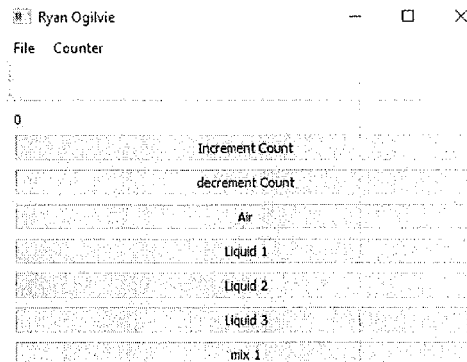

Figure 7: Food Grade Solenoids

Figure 8: Air filter

Figure 9: Current program screen

Key Features to test:

- Water flush line is acceptable
- Air filter will be acceptable
- Mixing function works as expected and is what the customer wants
- Food grade solenoids are acceptable
- Would the customer buy this product.
- Is this cost effective.

Demonstration 1:

- Location: University of Tulsa Entrepreneurship and Technology Innovation Class
- Attendance: Teammates, Classmates, Dr. Daily, 3 Panel Judges
- About: The MVP was shown as it was pictured in Figure 5 with the modifications described above. This was taken to class and shown as part of our demonstration pitch. During this demonstration we showed how you could select a mix on the raspberry pi and it would automatically dispense this mix.
- Thoughts + Recommendations:
  - Thought it was interesting
  - Would not potentially buy it, but they are not our customer
  - Make it look more appealing to bars so they will buy it, appearance is key

Demonstration 2:

- Location: Buffalo Wildwings
- Attendance: Team Member and Eli (bartender/server)
- About: The MVP in Figure 5 along with a video of it functioning was shown to the server/ bartender Eli. Comments, recommendations, and improvements were then asked for.
- Thoughts + Recommendations:
  - Genius idea and it would save a lot of time
  - It was suggested to have an automatic cup dispenser into the machine.
  - Don't know if they would buy it, he would have to ask management

Conclusion and Next Steps:

This device can be marketed as is but could use a few more upgrades. We need to make a point to speak with the person who can actually buy the device instead of talking to the users. Multiple interviews have stated they would only be the user not the buyer and we need to talk to upper level management. Also the overall look needs to be improved. Customer experience is very important based on our interviews with bartenders. Therefore a better looking machine needs to be made so it can get sold. We could also look into the cup dispenser idea from the interview with Buffalo Wild Wings.

Appendix 1. Code: Written in python to be executed by raspberry PI computer.

```python
#Drink Mixer Code
# Ryan Ogilvie
# 11/1/2017
#adapted from Dr. Daily Increment count assignment
# uses pyqt5 to as a gui and GPIO to output control to the solenoids

import RPi.GPIO as GPIO ## Import GPIO library
import time
from PyQt5.QtWidgets import (QApplication,
                QMainWindow,
                QWidget,
                QLabel,
                QGridLayout,
                QPushButton,
                QAction)
from PyQt5.QtCore import QCoreApplication
from PyQt5.QtGui import QIcon

#Define the main window class that inherits the predifined QMainWindow object.
class MainWindow(QMainWindow):

    def __init__(self):
        GPIO.setmode(GPIO.BCM) ## Use board pin numbering
        GPIO.setup(22, GPIO.OUT) ## Setup GPIO Pin 7 to OUT
        GPIO.setup(23, GPIO.OUT) ## Setup
        GPIO.setup(24, GPIO.OUT) ## Setup
        GPIO.setup(25, GPIO.OUT) ## Setup
        super().__init__()
        self.counter_value = 0
        self.airpin = 22
        self.init_ui()

    # all functions within a class need to reference itself.
    def init_ui(self):

        # A simple example of some built in functionality is the status bar.
        self.statusBar().showMessage("Status Bar Line.")

        #Build common menu options
        menubar = self.menuBar()

        #File Menu Items
        file_menu = menubar.addMenu('&File')
        open_file = QAction(QIcon(r'icons\android-folder.png'), '&Open', self)
        open_file.setShortcut('Ctrl+O')
        open_file.setStatusTip('Load Counter Data')
        open_file.triggered.connect(self.load_data)
        file_menu.addAction(open_file)


        save_file = QAction(QIcon(r'icons\arrow-down-c.png'), '&Save', self)
        save_file.setShortcut('Ctrl+S')
        save_file.setStatusTip('Save Counter Data')
        save_file.triggered.connect(self.save_data)
        file_menu.addAction(save_file)

        exit_action = QAction(QIcon(r'icons\close-round.png'), '&Exit', self)
        exit_action.setShortcut('Ctrl+Q')
        exit_action.setStatusTip('Exit application')
        exit_action.triggered.connect(self.close) #This is built in
        file_menu.addAction(exit_action)

        #Data Menu Items
```

```python
        data_menu = menubar.addMenu('&Counter')
        decrement_action = QAction(QIcon(r'icons\minus-round.png'), '&Decrement', self)
        decrement_action.setStatusTip('Subtract from the running counter')
        decrement_action.triggered.connect(self.decrement_count)
        data_menu.addAction(decrement_action)

        increment_action = QAction(QIcon(r'icons\plus-round.png'), '&Increment', self)
        increment_action.setStatusTip('ADD from the running counter')
        increment_action.triggered.connect(self.increment_count)
        data_menu.addAction(increment_action)


        main_toolbar = self.addToolBar("Main")

        main_toolbar.addAction(decrement_action)

        main_toolbar.addAction(increment_action)



        self.counter_label = QLabel("Hello PyQt5")


        increment_button = QPushButton("&Increment Count",self)
        increment_button.clicked.connect(self.increment_count)
        decrement_button = QPushButton("&decrement Count",self)
        decrement_button.clicked.connect(self.decrement_count)

        Air = QPushButton("Air",self)
        Air.pressed.connect(lambda: self.trigger(self.airpin,True))

        liquid1 = QPushButton("Liquid 1",self)
        liquid1.pressed.connect(lambda: self.trigger(23,True))

        liquid2 = QPushButton("Liquid 2",self)
        liquid2.pressed.connect(lambda: self.trigger(24,True))

        liquid3 = QPushButton("Liquid 3",self)
        liquid3.pressed.connect(lambda: self.trigger(25,True))


        mix1 = QPushButton("mix 1",self)
        mix1.pressed.connect(self.mix)

        main_widget = QWidget(self)
        self.setCentralWidget(main_widget)

        grid_layout = QGridLayout(main_widget)

        grid_layout.addWidget(self.counter_label,0,0,1,1)
        grid_layout.addWidget(increment_button,1,0,1,1)
        grid_layout.addWidget(decrement_button,2,0,1,1)
        grid_layout.addWidget(Air,4,0,2,1)
        grid_layout.addWidget(liquid1,6,0,2,1)
        grid_layout.addWidget(liquid2,8,0,2,1)
        grid_layout.addWidget(liquid3,10,0,2,1)
        grid_layout.addWidget(mix1,12,0,2,1)
        #Setup the window title and make it appear
        self.setWindowTitle("Ryan Ogilvie")
        self.show() #This is needed for the window to appear.

def increment_count(self):
    #GPIO.output(22,True) ## Turn on GPIO pin 7
```

```python
            self.counter_value += 1
            self.counter_label.setText("{}".format(self.counter_value))
            print(self.counter_label.text())

    def increment10_count(self):
        self.counter_value += 10
        self.counter_label.setText("{}".format(self.counter_value))
        print(self.counter_label.text())

    def trigger(self,pin,dir):
        #GPIO.output(22,True)
        GPIO.output(pin,True)
        time.sleep(self.counter_value)
        GPIO.output(pin,False)

        if True:
        #if dir==False :
            count=0
            while True:
                count += 1
                GPIO.output(22,True)
                time.sleep(2)
                GPIO.output(22,False)
                #time.sleep(count/400)

                if count > 0:
                    break
    def mix(self):
        GPIO.output(24,True)
        time.sleep(1)
        GPIO.output(24,False)
        GPIO.output(25,True)
        time.sleep(7)
        GPIO.output(25,False)
        GPIO.output(22,True)
        time.sleep(2)
        GPIO.output(22,False)

    def decrement_count(self):
        #GPIO.output(22,False) ## Turn on GPIO pin 7
        self.counter_value -= 1
        self.counter_label.setText("{}".format(self.counter_value))
        print(self.counter_label.text())

# def load_file(self)
    # with open('Filename.txt','r') as datafile:
        # datafile.read(self.counter.value)
        #pass

    def load_data(self):
        with open('count.txt','r') as datafile:
            ct_text=datafile.read()
            self.counter_value=int(ct_text)
        self.counter_label.setText("{}".format(self.counter_value))
        print(self.counter_label.text())

    def save_data(self):
        with open('count.txt','w') as datafile:
            datafile.write(str(self.counter_value))


# This line is run when the to get everything started.
if __name__ == '__main__':
    app = QApplication([]) #The empty list ([]) is passed inplace of system arguments.
    execute = MainWindow() #Calls the main window class we defined earlier.
    app.exec_() #this starts the event handling loop to accept interaction.
```

Appendix 2: Bill of materials (printed separately)

Drink Mixer Cost Breakdown

Ryan Ogilvie, Kelly Howell, Fitz Freeman, Yao Lu

labor base cost $ 20.00   per hour

Genral Name	Part Name	provider	cost	number in pkg	number used	total cost
Solenoid	4 of DIGITEN DC 12V 1/4" Inlet Feed Water Solenoid Valve Quick Connect N/C normally Closed no Water Pi	Amazon	8.49	1	8	$ 67.92
Hydraulic Tubing	Hydraulic Tubing	Amazon	10.99	30	25	$ 9.16
T fitting	Malida 1/4" Tee 3 Way Tube Quick Connect Push Fit RO Water Reverse Osmosis System set of 10	Amazon	6.99	10	16	$ 11.18
valve	Malida Equal Straight OD Tube Ball Valve Quick Connect Fitting 1/4-Inch by 1/4-Inch OD Valve Start RO Wa	Amazon	6.99	5	10	$ 13.98
Pneumatic tank + compressor ass	Viair 10000 Onboard Air System	Amazon	119.05	1	1	$ 119.05
Pressure regulator + gauge	Viair 90150 0-200 PSI Air Pressure Regulator	Amazon	29.89	1	2	$ 59.78
12V power supply	BMOUO 12V 30A DC Universal Regulated Switching Power Supply 360W for CCTV, Radio, Computer Project	Amazon	18.98	1	1	$ 18.98
gauge	Viair 90087 2.0" White Face Illuminated Single Needle Gauge	Amazon	13.95	1	1	$ 13.95
fittings	Neeshow 1/4" OD Quick Connect Push In to Connect Water Tube Fitting Set Of 20 (Y+T+I+L Type Combo)	Amazon	9.99	20	8	$ 4.00
Y Fitting	YZM Quick Connect fittings RO Water Filters (10, Y Type 1/4")	Amazon	6.9	10	7	$ 4.83
8- 12V relay	JBtek 8 Channel DC 5V Relay Module for Arduino Raspberry Pi DSP AVR PIC ARM	Amazon	8.98	1	1	$ 8.98
rasberrry pi	Raspberry Pi	Amazon	41.6	1	1	$ 41.60
Rasberry pi case	RS Raspberry Pi 7-Inch LCD Touch Screen Case, Black	Home Depot	12.9	1	1	$ 12.90
Wood sheet	5.0MM 2x4 underlayment panel	Home Depot	6.74	1	2	$ 13.48
1x2" wood bar	1x2-8FT Strip	Home Depot	1.03	1	2	$ 2.06
wood screws	PT 6 x 1-1/4" Coarse screw 1lb	Home depot	6.41	1	0.1	$ 0.64
5V regulator	uxcell Power Converter Regulator DC 12V to DC 5V 3A 15W Step Down Waterproof Voltage Convert Transf	Amazon	7.99	1	1	$ 7.99
1/4" NPT to push in fitting	Express Water 1/4" Male Connector Quick Connect Parts Fitting Connection for Water Filters / Reverse Osr	Amazon	9.99	10	4	$ 4.00
Brass 1/4" T fitting	Anderson Metals 56101 Brass Pipe Fitting, Barstock Tee, 1/4" x 1/4" x 1/4" NPT Female Pipe	Amazon	6.57	1	1	$ 6.57
air filter	Neiko 30252A Water and Oil Separator for Air Line	1/4" NPT Inlet and Outlet	Amazon	8.45	1	1	$ 8.45
Rasberry Pi touchscreen	Raspberry Pi 7" Touchscreen Display	Amazon	69.99	1	1	$ 69.99
relief valve	Smith-Cooper International 8140 Series Brass Mini Ball Valve, Inline, Lever Handle, 1/4" NPT Female, Non-F	Amazon	6.49	1	1	$ 6.49
empty 2 liter bottles	Empty 2 liter bottles	Would be Trash	0	1	8	$ -

Labor	time		labor cost
Cutting Wood	1	$	10.00
Housing assembly	1.5	$	15.00
Part placement	1	$	10.00
Programming	0.5	$	5.00
Wiring	1	$	10.00
Testing	1	$	10.00
	Labor Total	$	60.00

	Part Total	Final Total
Totals	$ 505.98	$ 565.98
Overall:	$ 505.98	$ 565.98

Appendix 3:

THE COST OF ADVERTISING NATIONALLY BROKEN DOWN BY MEDIUM

Webpage FX	Setup Process	Setup Cost	Cost of Media	Cost to Continue
NATIONAL TV ADVERTISING	Design + Production	$2,000 to $1 million	approx. $112,000 per 30-second ad	Cost of media + agency hourly rate
NATIONAL MAGAZINE ADVERTISING	Design	$500 to $397,800	average of approx. $250,000 per ad	Cost of media + agency hourly rate
NATIONAL NEWSPAPER ADVERTISING	Design	$11 to $1.4 million	average of approx. $113,000 per ad	Cost of media + additional design in future
DIRECT MAIL MARKETING	Design	$50 to $7,200	approx $51.40 per order	Design, publishing + postage costs
TELEMARKETING	Script Writing	$1,000 to $5,200	$7 - $70 per hour or $35 - $60 per lead	$20-$60/hour
NATIONAL SEARCH ENGINE OPTIMIZATION	Website Configuration	$4,000 to $10,0000	Free	~$500/month to internet marketer
NATIONAL PAY PER CLICK MARKETING	Website Configuration	$4,000 to $10,0000	5c-$3 per qualified visitor	Cost of clicks + ~$500/month to internet marketer
NATIONAL EMAIL MARKETING	Email Template Design	$4,000 to $10,0000	5c-$3 per qualified visitor	~$500/month to internet marketer
WEB CONTENT MARKETING CAMPAIGN	Development of web content assets and graphical elements	$6,000 to $12,000	Free	$0 (If content is written around "evergreen" topics)

https://www.webpagefx.com/blog/wp-content/uploads/2013/07/Cost-of-Adverti sing-82115.png