



The Smart Water Bottle

Team A6: Alan, Erin, Matthew

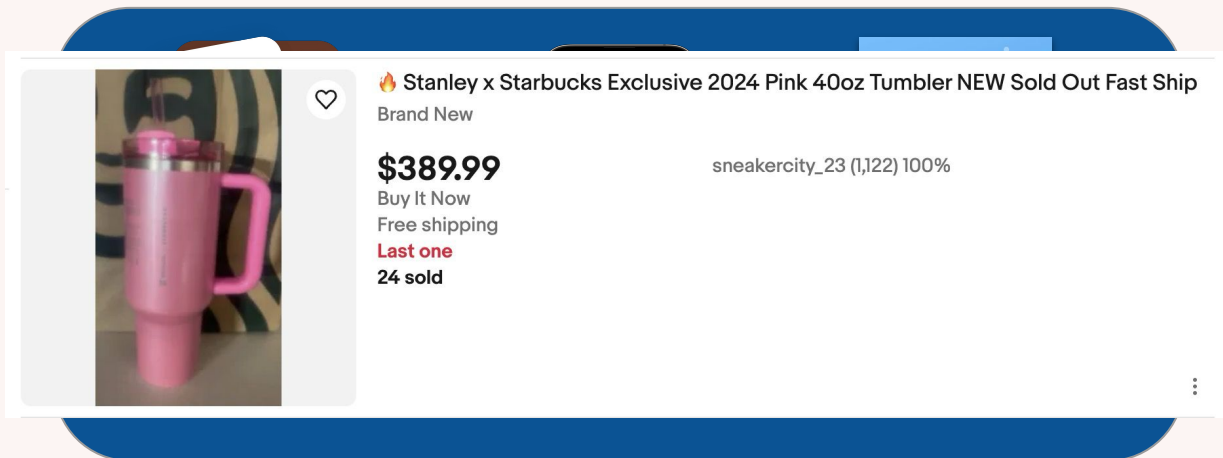
# Why a Smart Water Bottle?

**\$4.03 Billion**

Global water bottle market

★ **1,000,000+**

Reviews for water tracking apps



Stanley x Starbucks Exclusive 2024 Pink 40oz Tumbler NEW Sold Out Fast Ship

Brand New

**\$389.99**

Buy It Now

Free shipping

**Last one**

**24 sold**

sneakercity\_23 (1,122) 100%

⋮

# Why a Smart Water Bottle?

On average, how many 16 oz glasses of water do you drink per day? (1 bottle of water = 16 oz)



**BRAIN**  
75% WATER

**SKIN**  
80% WATER

**MUSCLE**  
75% WATER



1950s



1970s



2000s



2010s



2020



2023

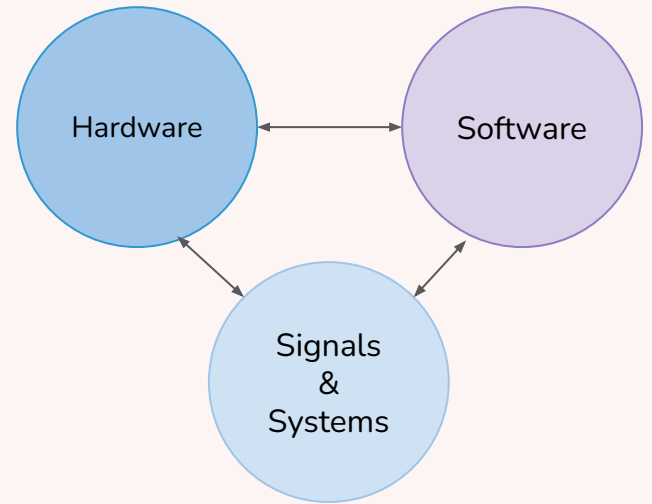


2024

# Our Solution

Merge water bottles and the tracking app into one

1. Track water consumption
2. Identify different liquids
3. Gamification through streaks + social media



# Use Case Requirements

## 1. Track liquid consumption

Bottle measures level of water within **+/- 20%**

## 3. Bottle -> App Communication

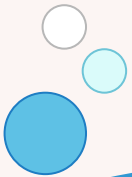
Send data about water to user's phone via **Bluetooth**

## 2. Differentiate liquids

Categorize between water, soda, coffee, juice with at least **85% accuracy**

## 4. User Interface

Accessible user interface in **app** and on the **bottle** for users to see



# Our Approach

## Hardware Bottle

- **Seeed Xiao**
- **LCD** display for on-bottle display
- **Ultrasonic** transducer for water level
- **Temperature sensor**
- **Capacitance** for identifying liquid
- **Weight plate** for density
- **Photodiode** for color of liquid

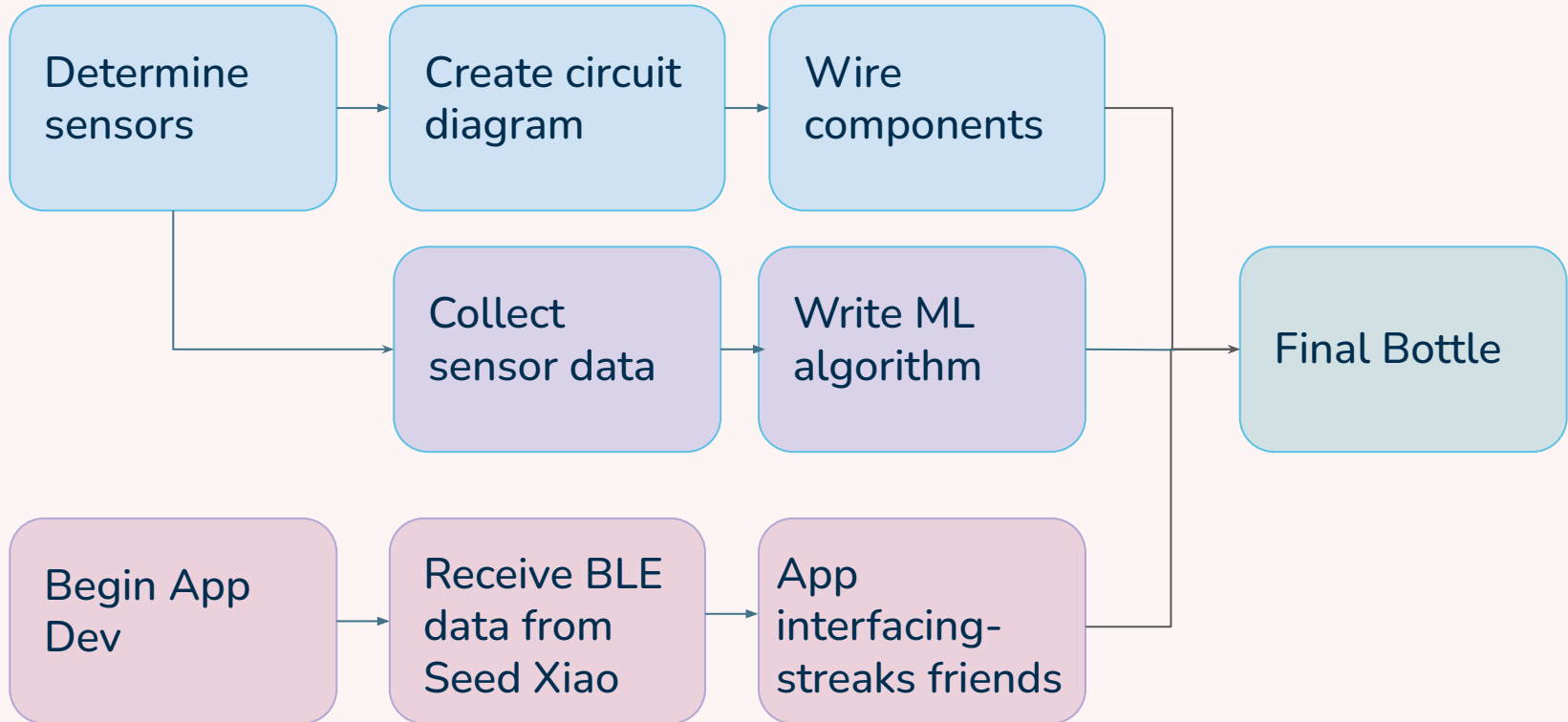
## React Native App

- **Android + IOS** app
- Get sensor data from bottle via **Bluetooth** when needed
- **Accessible UI** for all users
- **Streaks** Page
- Friends/**Social** view
- **Total water intake** view

## ML Liquid Differentiator

- Use **capacitance, density, temperature, color** to guess liquid type
- **Classify** liquid between: **coffee, soda, water, juice**
- On **phone ML model** will classify liquids based on bottle data

# Our Approach



# Technical Difficulties

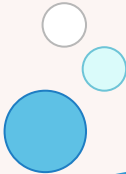
Use waterproof components when possible

Keep sensitive electronics separated from liquid compartment

Modify a store bought bottle and use food safe material like ABS

Choose small/light components and prioritize efficiency

Only collect and send data when needed  
Solar panels





# Testing, Verification, and Metrics

## Water Level

- Use a **graded recipient** to match ground truth with reading

## Liquid Classifier

- Check classifier with **actual content** of water bottle.
- Identify which **sensors are most significant** for determination

## Bluetooth Connection

- Test bluetooth common usage
- Bottle + phone on **desk**
- Bottle in **bag**, phone in **pocket**
- Bottle and phone in **different rooms**

## Battery Power

- **Leave the bottle running a few hours**, with occasional 'drinking' to simulate usage

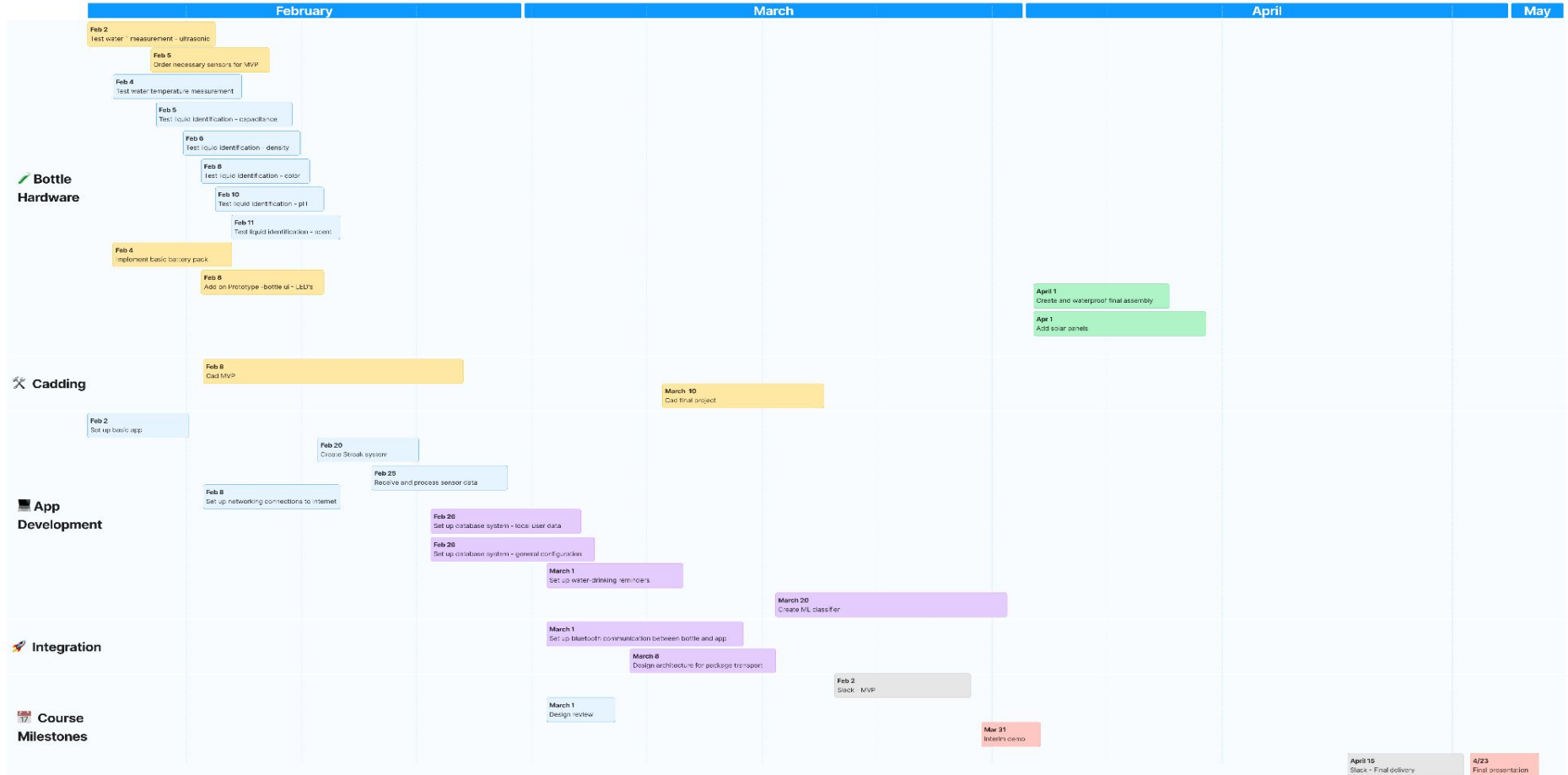
## Food Safety

- **Hold each other accountable** for materials used
- We will **research the materials** extensively and visually inspect the bottle

## App

- **Unit testing** each feature
- **Beta test** users to see if the app is intuitive to use

# Future Plans



# MVP Goals

## Water Level

- Measure **water level changes** within the bottle using a capacitor and ultrasonic

## Simplified Liquid Classifier

- Identify **water and non water liquid** using photodiode and capacitance

## Bluetooth App

- Working app that can **receive data from bottle**
- **User friendly interface** that is easy to use

## Food Safety

- Create a safe bottle people can drink out of

# Labor Div

## Matthew

- Hardware
- Sensors
- CAD of bott



op & Bottle

e

bottle

