StreamFi

Team 10
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Motivation

- Opaque fluid containers are inconvenient to monitor
- Lack of precise measuring methods
Concept

- Universal retrofit volume measuring platform
  - Home, stadiums, festivals, etc.
- Monitor Containers
  - Active acoustic sensing to measure volume
    - Sweep frequencies to determine change
  - Notifications & container tracking via mobile application
Competitive Analysis

**Vessyl ($199)**
- Tracks calorie content of beverage in cup
- Detects different kinds of liquids

**H2OPal ($99)**
- Attaches to the bottom of a water bottle
- Detects water usage statistics using accelerometer/weight sensor

**KegBot ($129/tap)**
- Provides real-time statistics on how much beer each user is drinking
- Detects how much beer is in the keg
Requirements

- **Notify the user on condition after determining liquid level**
  - Mobile application or simple email/sms notification
  - Stream’s lifetime data stored
- **Non-intrusive to container**
  - Attached to the outside and quick calibration
- **Easily maintainable**
  - Notification on damage or low power
- **Robust and durable**
  - Liquid resistant, communication fault-tolerant and consistent data
- **Uniquely identifiable and specific to a user**
  - Own multiple streams and view an aggregated dataset
## Technical Specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
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<tbody>
<tr>
<td>Transducer</td>
<td>Sweep vibrations across container</td>
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<tr>
<td></td>
<td>Adafruit Medium Surface Transducer</td>
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<tr>
<td></td>
<td>MAX98306 audio amplifier</td>
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<tr>
<td>Piezoelectric sensor</td>
<td>Read back vibrations from vibration sensor</td>
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<td></td>
<td>Piezo element (SparkFun)</td>
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<tr>
<td>WiFi module</td>
<td>Communication between container and backend</td>
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<td>ESP8266</td>
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<td>Power source</td>
<td>Must be rechargeable/last a full day on one charge</td>
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<tr>
<td></td>
<td>Lithium Ion Battery</td>
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<td>USB LiPoly Charger</td>
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<tr>
<td>S3 and AWS Lambda</td>
<td>Backend data storage and processing</td>
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<tr>
<td>Android app</td>
<td>Frontend display and notifications</td>
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