Summary

The service manager responsible for maximizing the availability of large machines used to fill cartons with fruit juice, needs to know when to send engineers to a site, preferably before the machine has failed.

Storyline

A large drinks company has several sites each with several production lines filling fruit juice into paper cartons. A centralized maintenance department has a small staff of engineers that need to be sent to maintain the filling machines to perform preventative maintenance or fix breakdowns. With IoT data gathered from the machines it should be possible to predict failures and send the engineer to repair the machine before the machine actually fails and an unscheduled production downtime occurs.
Persona

Mario

The maintenance department manager

ACME drinks Inc.

Responsibilities

• Ensure the smooth running of all the machines at ACME Drinks Inc., across 4 plants
• Dispatch engineers (3 of) between the sites in an optimal way, considering travel time and cost
• Annual appraisal and review of the engineers
• Budget and cost follow up the maintenance department

About

• 52 years old. Married, with 2 teenage children.
• 33 years’ experience in the maintenance
• Previously worked as a service engineer
• Practical & pragmatic

Needs

• I need a good overview of how the machines are running.
• I need clear indications of predicted failures
• I need to keep track of the engineers
• I need to order the spare parts to match the service event (preventative maintenance or failure) and send them to the correct location

Main Goals

• Maximize the time the machines are available for production
• Reduce the number and total time of failures, ie increase the mean time between failure
• Work within the budget agreed.
• Contribute to a happy working environment for the engineers.

Pain Points

• Difficult to get an overview of the total situation today, except by calling the production managers at each plant
• Engineers can be difficult to locate when a failure occurs
• The required parts are not always available when the service arrives to perform service.
Point of View

As a Maintenance manager I need a way to gather machine performance data so that I can predict likely failures before the machine stops and send an engineer ahead of time so that the efficiency of our machines is maximized.
# User Experience Journey

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>Bob checks the status of all machines</th>
<th>The machine is running, but sensor S17 indicates vibration; this could mean a failure soon</th>
<th>Checking the service engineers works schedule he sees that Sarah is planned to perform a preventative Maintenance in that plant</th>
<th>Sarah receives the updated work instruction, with the location of the machine and details of the problem</th>
<th>Using augmented reality screen, the engineer can see the location of the sensor and also 5 most likely problems</th>
<th>The engineer diagnoses the problems (loose drive belt) and replaces the faulty part. She reports the service as completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINDSET</td>
<td>What’s wrong with that machine?</td>
<td>We need to get an engineer out there!</td>
<td>Let’s have Sarah look at the problem straightaway</td>
<td>Where is this machine located? Where is Sensor S17 located on the machine</td>
<td>Could be loose drive belt... Could be a worn bearing...</td>
<td>That was easier than I thought. Great!</td>
</tr>
<tr>
<td>FEELING</td>
<td>😊</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>TOUCH POINTS</td>
<td>Machine overview</td>
<td>Machine details and predictive engine</td>
<td>Engineer work schedule</td>
<td>Plant map and machine diagram</td>
<td>Machine AR and problem overlay</td>
<td>Engineer work schedule, machine details</td>
</tr>
</tbody>
</table>
User selects Juice Line 201 and opens the detail view
## Machine Detail View - Juice Line 201

**Machine Type:** Juice  
**Model:** X200 Mk1  

Senior S17 reports: Excess vibration in LHS final sealing unit

**Predicted Failure within 4-14 hours**

<table>
<thead>
<tr>
<th>Failure Component</th>
<th>Probability %</th>
<th>Standard Replacement cost</th>
<th>Parts Stock</th>
<th>Order Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Drive Belt</td>
<td>27</td>
<td><strong>150.00 USD</strong></td>
<td>Shelbyville: 2</td>
<td>Order</td>
</tr>
<tr>
<td>2301-4567</td>
<td></td>
<td></td>
<td>MainStock: 10</td>
<td></td>
</tr>
<tr>
<td>Auxiliary bearing LHS</td>
<td>23</td>
<td><strong>225.00 USD</strong></td>
<td>Shelbyville: 0</td>
<td>Order</td>
</tr>
<tr>
<td>2301-9483</td>
<td></td>
<td></td>
<td>MainStock: 7</td>
<td></td>
</tr>
<tr>
<td>Ejector Solenoid</td>
<td>15</td>
<td><strong>38.50 USD</strong></td>
<td>Shelbyville: 7</td>
<td>Order</td>
</tr>
<tr>
<td>1515-0023</td>
<td></td>
<td></td>
<td>MainStock: 22</td>
<td></td>
</tr>
</tbody>
</table>

**Packages per hour:** 4850