Story

Needs, goals, and pain points addressed

Summary

The manager at a municipal regulatory agency needs a solution to monitor solar powered municipal waste compactors, that replace classic public waste bins in the city’s public space.

Storyline

The city’s regulatory agency invested in setting up solar powered waste compactors in public spaces to reduce cost in municipal waste disposal, as the compactors need to be emptied much less frequently than classic waste bins. Additionally, they are supposed to help deliver the city’s clean, ecological image by helping keeping spaces free of waste while using solar power.

The manager needs to gain insight into the operating status and history of each compactor to optimize the cycles and routes on which the compactors are emptied and though leverage the full potential of the invest. If he/she gets alerted on units out of order in real time and knows which units tend to run out of power during the day or tend to be full before their scheduled emptying route, he is able to react on failures quickly and optimize routes and locations of the compactors to save cost while ensuring a clean city appearance.
Persona
Needs, goals and pain points

Peter Ordentlich
Municipal regulatory manager

“I want my city clean and tidy and I have to keep my offices costs on a reasonable level”

About
- 52, 25 years of experience as an officer in my municipal regulatory agency
- I make sure public waste collection works fine and effective by keeping an overview on the process.
- I coordinate public service workers, who set up, empty and repair public waste bins and compactors
- As my office is public funded, I am always on a budget and have to keep costs down.

Responsibilities
- Ensure a clean city appearance
- Help to deliver the city’s green, clean image
- Manage the setup and operation of public waste bins and collectors
- Represent the cost of public waste collection towards the city’s council

Main Goals
- Keeping the city’s public spaces tidy and free from waste
- Quickly react on defect bins and compactors
- Reduce cost of public waste collection by optimizing routes and emptying cycles

Needs
- Real time information and alarms on compactors that quit working
- Easy and fast way to arrange compactors with problems get fixed
- Recommendations on actions hot to fix reoccurring problems
- Support in planning routes and emptying cycles

Pain Points
- People tend to carelessly throw away their waste if nearby bins or collectors are full
- Getting informed late on defect compactors
- Commissioning an order to get things fixed is a tedious process
- Planning of waste collection and maintenance routes is difficult because of missing data.
- It’s difficult to tell how to fix reoccurring problems on the same compactor
Point of View (PoV)

User + need + insight/why

Point of View

As a manager for public waste disposal at a municipal regulatory agency

I need a way to effectively monitor and manage the trash compactors in my city’s public space

so that municipal spaces are kept tidy and clean from waste at reasonable costs.
## UX Journey

### Actions, Mindset, Feelings and Touchpoints

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>MINDSET</th>
<th>FEELING</th>
<th>TOUCH POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual day in office, answer phone call: “public spot dirty, waste everywhere”</td>
<td>“not again!” “it’s always the closest waste compactor, probably it’s dead or full…” “need to check”</td>
<td></td>
<td>telephone</td>
</tr>
<tr>
<td>Check who is working on schedule</td>
<td>“okay, who can check that, let me see” “where’s this operating schedule?!” “who is close?”</td>
<td></td>
<td>printed operating schedule</td>
</tr>
<tr>
<td>Call workers to find out who is close to littered public spot</td>
<td>“why is it so difficult to tell where exactly the units are placed?” “at least the guy is out to check the problem” “this needed hours”</td>
<td></td>
<td>Setup plan of compactors</td>
</tr>
<tr>
<td>Worker gets instructed on location of possibly defect compactors</td>
<td>“the motor again” “wait, on that unit? Doesn’t it often have motor problems? not sure” “Okay, first of all we need it fixed”</td>
<td></td>
<td>telephone</td>
</tr>
<tr>
<td>Worker checks unit, finds out it’s motor blew.</td>
<td>“to have that repaired I need to fill in these two forms” “why do I have to give all this info; it should be accessible”</td>
<td></td>
<td>telephone again</td>
</tr>
<tr>
<td>Does not have spare. Can’t repair himself. Reports.</td>
<td>“okay, that works for now, but there has to be a reason for the constant failures of the unit” “not really satisfied!”</td>
<td></td>
<td>form 23-B and 25-F. At least six pages each</td>
</tr>
<tr>
<td>Worker identifies defect unit</td>
<td></td>
<td></td>
<td>letter or telephone. possibly even FAX!</td>
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<tr>
<td>Manager orders repair. Order includes two large forms</td>
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<tr>
<td>Manager receives confirmation the unit is repaired</td>
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<td></td>
<td></td>
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</tbody>
</table>
Prototype
IoT-connected waste compactor cockpit app

IOT Network:
- classic waste bins are replaced with solar powered, IOT connected waste compactors
- compactors measure their critical operation data like battery stats, number of compactor runs, compactor motor current, capacity level and solar power intake
- units are connected via a wide area wireless network and push their real time operating stats into HCP, which persists data, generates alarms on unusual states and provides a cockpit.
- goals: react quickly on defects / provide guidance on how to optimize the infrastructure

Mockup I: Alert centered one-page cockpit – focusing on quick response, no analytics
- based on a card layout, so that cards will rearrange if user switches to mobile device
- shows alerts for compactors reaching their capacity limits and defect units
- geo match card allows to identify the affected units’ location
- pie chart shows which fraction of units in area are operational --> how pressing are defects?
- clicking a reported unit opens a popup, allowing to dispatch a service order
Mockup II: multi-window cockpit, additionally allowing analytics and optimization

- List based overview screen (left) and unit detail screen (right) connected via navigation
- Limited interactive prototype accessible via build.io: https://standard.build.me/api/projects/3a3c67d2c1b927190cd3474/prototype/snapshot/latest/index.html#/14774962575328505_S3

Overview Screen, containing interactive list of all compactors in area

- Filtering by geolocation or operating status is critical! (only simulated in build.io)
- List showing operational status of compactors visualized by icons
- Clicking a row opens the units Detail Screen
Unit Detail Screen, containing real time and historical operation stats of compactor

- split in three horizontally layered sections, that can be navigated via the links in the header
  - Status
  - Solved alerts
  - Analytics and recommendations
- The top section shows all real time stats of the unit and contains a switch (no button in build for this context) to fill out a service order for the unit --> tackles alert and response needs

while “solved alerts” helps to understand which problems occurred lately.
- The list should help to develop an understanding for the situation of the location of the unit. Many alarms caused by low solar charging currents could indicate a blocked panel to give an example.
- The analytics section uses historical alarms and possibly service workers reports to give summarized information and a connected recommendation of acting. If it e.g. counted many alerts on blocked compactors or unusual motor currents it could recommend to check or change the compactors motor.
- These sections tackle the optimization needs of the user