Story

E-Cars will be the future. Currently one of the main barriers for a broader dissemination is the limited range of the battery and the relatively long charging time of the battery compared to the time needed to fuel a petrol car tank. There might be E-cars developed, where the battery can be easily changed automatically in a view seconds at battery change/charge stations (under the prerequisite, that car manufacturers agree on standard adapters for batteries). This would also be valid for self-driving cars. With self driving cars the ownership of cars will more and more change to just rent a car for specific trips. Cars will therefore have much more time of usage per day and thus less time, where the batteries can be recharged.

As a “battery administrator” of such a battery change/charge chain, it is necessary, to have an overview about the live-cycle of these batteries (when to change as end of life cycle), but also to know, how many batteries of which type are available at all stations and how many will be most likely used.

But in addition also an app for the e-card drivers has to be provided, to inform, where which battery with which battery charge is currently available and even can be reserved.
Persona

Ivy
Chief Battery Administrator

“I like to get things done effectively and efficiently, as my work ensures the availability of working batteries wherever and whenever they are needed”

About
• 52, married, 2 years of battery management experience.
• Being the person who makes the car battery change and relocation decisions, I have to ensure the availability of car batteries in our different battery centers and to optimize the route for the technicians, who are responsible for the replacement/relocation.
• I work with the CEO, Technicians and Salesman from our Battery Pool of Vendors

Responsibilities
• I am responsible for the car batteries of all of our battery centers in Bavaria.
• I organize the replacement of damaged batteries and batteries at their end of useful life.
• I spend most of my time on my computer optimizing the route of our battery technicians and ordering new ones from our pool of vendors.
• I finalize the routes once a day for the following day and place orders for new ones once a week.

Needs
• I need the status of all batteries in our battery stations.
• I need the status of the number of batteries of all types in our stock.
• I need the forecast of the number of batteries needed for all our battery stations on a daily level for the upcoming week for all battery types.

Main Goals
• Ensure availability of batteries for our customers in our battery change centers considering the future need.
• Optimizing the route for all of our technicians responsible for the change of batteries in our battery centers.
• Providing the basis for cost calculations for battery replacements having finally an impact for the price calculation.

Pain Points
• Peak hours where many e-car drivers are changing their batteries.
• Non availability of batteries is leading to reduced sales and customers who potentially might change to a competitor.
• Too many batteries are leading to high costs and a reduced margin.
• Route of technicians has to be organized to ensure the availability of batteries but also to optimize the route.
Point of View

As a _Chief battery Administrator

I need a way to get the status of all of our batteries in our battery stations 

so that _I can organize the replacements by our technicians and ensure the availability of batteries for our customers.

Point of View

As a _Chief battery Administrator

I need a way to get the status of then number of batteries of all battery types in our stock.

so that _I can organize the reordering of batteries at our pool of vendors.
Point of View

As a Chief battery Administrator

I need a way to get the forecast of the most likely demand of batteries per type in each station.

so that I can organize the relocation of batteries in our stations.
**User Experience Journey Replacement/Relocation and ordering of batteries which are at the end of their useful life or damaged**

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>MINDSET</th>
<th>FEELING</th>
<th>TOUCH POINTS</th>
</tr>
</thead>
</table>
| • Open App sensor data batteries  
• Check status damaged and end of useful live | • Again some damaged ones  
• And all in different stations  
• Very much to organize | 😊 | • Battery app  
• Stock menu  
• Vendor from pool of vendors to prove delivery in time |
| • Check availability in our warehouse  
• Most of them are available  
• Missing ones are automatically ordered at our pool of vendors – will be available this evening | • All available for tomorrow and minimum stock available  
• Does forecast perhaps need additional stock? | 😞 | • Forecast menu  
• Forecast menu  
• Event calendar |
| • Check forecast proposal | • Unusual forecast in some stations  
• Should I follow the proposal – this would need some additional relocations but also some additional orders | | • Forecast menu  
• Event calendar  
• Route planning menu  
• Route planning app  
• Technician for route confirmation |
| • Check reason for high need | • Reason shows special event with lot of visitors  
• Accept proposal | | |
| • Make route proposal for technicians  
• Open route planning app  
• Input high priority stations | • With all the replacement and relocations will be challenge | | |
| Execute “automatic proposal”  
Receive proposal | Proposal perfect – just to transfer to technicians | | |
Overview Page

**E-Battery**

Overall overview

<table>
<thead>
<tr>
<th>Nr. Of batteries to be replaced</th>
<th>Non Availability Battery Type #1 Station Mainroad</th>
<th>5 min ago</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Battery Charger Station Train Station not working</td>
<td>1 hour ago</td>
</tr>
<tr>
<td></td>
<td>25 batteries replaced</td>
<td>1 day ago</td>
</tr>
<tr>
<td></td>
<td>Warehouse battery deliveries completed</td>
<td>2 days ago</td>
</tr>
</tbody>
</table>

**Number damaged Batteries Type #1**

<table>
<thead>
<tr>
<th></th>
<th>Today</th>
<th>Day+1</th>
<th>Day+2</th>
<th>Day+3</th>
<th>Day+4</th>
<th>Day+5</th>
<th>Day+6</th>
<th>Day+7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock Type 1</td>
<td></td>
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<td>26</td>
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**Number damaged Batteries Type #2**

<table>
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<th>Day+1</th>
<th>Day+2</th>
<th>Day+3</th>
<th>Day+4</th>
<th>Day+5</th>
<th>Day+6</th>
<th>Day+7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock Type 2</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17</td>
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**Number damaged Batteries Type #3**

<table>
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<tr>
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<th>Day+1</th>
<th>Day+2</th>
<th>Day+3</th>
<th>Day+4</th>
<th>Day+5</th>
<th>Day+6</th>
<th>Day+7</th>
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<tbody>
<tr>
<td>Stock Type 3</td>
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**Number damaged Batteries Type #4**

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<tr>
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<th>Day+1</th>
<th>Day+2</th>
<th>Day+3</th>
<th>Day+4</th>
<th>Day+5</th>
<th>Day+6</th>
<th>Day+7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock Type 4</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55</td>
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</tbody>
</table>
Notify

Insert Chart

Page per area of responsibility

T#1: 0  T#2: 0  T#3: 1  T#4: 0

Relocate 2 batteries Type 1 from Station A to B 5 hours ago

20 16

# to be replace

T#1: 1  T#2: 1  T#3: 2  T#4: 0

2 pm 3pm 4pm 5pm 6pm 7pm 8pm

Problem Battery Charger #1
Charger Temperature
60 °C
40 °C
20 °C

Load Cycle

Battery Charger #2
Charger Temperature
60 °C
40 °C
20 °C

Load Cycle

Auto Route Planning