IMAGINE IOT
PROTOTYPE CHALLENGE

EXPIRE DATE OF MERCHENDIZE SCENARIO IN RETAIL
In retail stores especially in groceries sector expire date is very important. The retailers are losing a lot of money due to price reduction. In big stores the number of articles can accomplish up to 300,000 articles. Manual work is very hard for the store employees.

In some countries an article cannot be sold when it’s expire date is very soon (e.g. apple 2 days before expiration). The retailers give them to human foundation (e.g. Caritas) for nothing. In this case they are losing the full cost of these articles. With this expire date leads not only to price reduction (e.g. 30%) but also to 100% when it’s exceeded.

Store managers need to handle the order quantities carefully to prevent often reducing the price for those articles which will not be sold before their date expires. And sure they are making mistakes and wrong decisions (as every user who is working manually). They want for the future to prevent many article price reduction to prevent sales lost.
I have talked to the German SAP Retail customers Kaufland and REWE.

They do a lot of manual work. From time to time they need to manually check expire date for many article. Then they maintain these dates in the system. After that a list is printed. A store employee goes thru the selves and change the price manually by putting a label with the reduced price on it.

There are some retailers who use digital displays. These displays get data from the backend and send data to the backend by using WIFI/SENSORS. This means expire date is known in the backend system. To help store manager doing this in real time to find out these articles and be able to react on time and every time (due to real time) to prevent sales lost.

Furthermore Store manager need a way to analyze the root cause why an article is not sold on time to make a plan in advance to prevent price reduction.

As store manager are dealing with million things a day they need things done quickly and everywhere. Therefore a solution for mobile devices is meaningful.
Persona

Max Meyer

The Specialist

“I love my work and doing things quick and efficient.”

About
- 50, married, Store manager at Retail Sore Kaufland, a German Retailer, 20 years of store management experience.
- I studied Business Administration at the University of Munich
- I am responsible for store sales and need to have the overview about sales.
- I would like to be informed in advance and in time about the article which will expire soon and hope to have better analysis why we are losing money
- I work with the store employees, facility manager, central purchasing manager and executives

Responsibilities
- Planning Order Quantity.
- Planning of shelf layout.
- Analyze sales and lost
- Ensure customer satisfaction.

Needs
- I need to know in advance and in time which articles with expire soon.
- I need to be able to reduce the sales price of soon expired articles easily and quick.
- I need to know why we don’t sell these article on time.
- I need to optimize sales quantity and value

Main Goals
- Monitor which article will expire soon
- Easy change the price on the shelves.
- Analyze sales history for article which will expire soon.
- Easy to find the shelve where the article placed on

Pain Points
- I am informed too late about the articles which will be expired soon.
- We are losing many time for changing the price on the shelves and for the point of sale.
- I don’t know why the store is losing more and more money.
- The store is very big; it hard to find the location of some articles.
As a store manager

I need a way to be informed in advance about articles which will expire soon

so that I can reduce the price on time to be able to sell these articles before they expire.
Point of View 2

As a store manager

I need a way to find out why these articles were not sold

so that I can prevent price reduction and sales lost for the future.
Point of View 3

As a store manager

I need a way to print the label of the reduced price

so that I can give it to an employee to put it on the reduced article on the shelve.
Point of View 4

As a store facility manager

I need a way to easily find the shelve where the corresponding article is located

so that I can repair the broken digital display.
<table>
<thead>
<tr>
<th>MINDSET</th>
<th>Sales of some articles seems to be bad</th>
<th>we are losing more and more money</th>
<th>We don't find the shelves easily</th>
<th>High reduction of the price</th>
<th>Changing the price too complicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTIONS</td>
<td>Go to shelves and see the expire date</td>
<td>Look to sales history</td>
<td>Analyze sales</td>
<td>Look to the map of the shelves layout</td>
<td>Go to shelves and see the price</td>
</tr>
<tr>
<td>FEELING</td>
<td>🌞</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOUCH POINTS</td>
<td>Shelve Digital Display</td>
<td>Sales data</td>
<td>Sales data Analyzing Tools</td>
<td>Map Navigation</td>
<td>Shelve</td>
</tr>
<tr>
<td>🌞</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>☹</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Prototype
Prototype screens for an IoT application to solve your PoV

Description and Explanation of the prototype
The store manager gets a SMS and looks to his mobile.
He sees a red light with the expired date icon.
He calls the app and sees Merchandize categories (MC) which shows red number (digits). This is the initial screen - screen 1.
Remark: A Merchandize category contains articles with the same type (e.g. drinks for Co-Cola, Fanta, etc.).
The first left MC contains the articles with the biggest quantity which will expire soon.
The store manager clicks on the MC or goes to "Article Overview". This is screen 2.
There he can see the articles. He can hide the article which will not expire soon, so that he can consecrate on the issues.

When he clicks on the "Process Items" he navigate to the "Detail Screen". This is screen 3.
Here he can analyze the root cause of less sales of the article. He pushes therefore the button "Forecast Analysis". This is screen 5.
Here he gets the sales history of about 2 years for the article in real time and comparison to the ordered quantity. The system gives him recommendations. This gives him a hint or help to think about following the recommendation by planning less order quantities for the future after discussing with central purchasing manager and executives.
Then he navigate back to the "Detail Screen, screen 3.
Here he can change the price, print the reduced price label or directly go to the shelf by using GPS. When clicks on GPS he navigate the video camera which shows him the place of the article and show the road to go to it.
Then he navigate back to the Price transfer screen to digital display – screen 3.
If the store use digital display then a transfer of the changed price to the display can be executed directly to the digit display. Furthermore POS is provided with the reduced price and the backend is also updated.
When he push the button "Transfer Price to Digital Display" he can see the data transfer status. This is screen 4.
In this screen he sees if the display gets the price. This is the status "Done". Sometime a digital display is not responding when sending the new price to it. So he can navigate to it to see the problem and send the facility manager a GPS link to easily find the digital display.
At this time processing of the MC. So he navigates back to the initial screen and click on the second MC and proceed it until all article and done. When he finish all MCs then he leaves the APP.

**Link Prototypes in BUILD**

https://standard.build.me/api/projects/ec531adc2576b9430cd2955a/prototype/snapshot/latest/index.html#/14774294436624302_S3

You can also find the picture of the prototype in the next page in this document.
Number of Merchandize Categories: 4
Number of Total Articles: 26
Number of Total pieces: 320

Total number of soon Expired Articles in pieces: **272**

Number of articles in MC: 5 articles
Number of Total Articles in MC: 400 pcs

Total number of soon Expired Articles: **120 pcs**
# Expiry Date – Beverage MC – Detail Screen

Total Merchandize values: 520 EUR

<table>
<thead>
<tr>
<th>Article</th>
<th>Expiry Date</th>
<th>Soon Expired Quant. In pcs</th>
<th>Reduced Price in EUR</th>
<th>%</th>
<th>Original Price in EUR</th>
<th>Total Quant. In pcs</th>
<th>Change Price</th>
<th>Print Label</th>
<th>Navigate to Shelve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>05/Nov/2016</td>
<td>60</td>
<td>0.80</td>
<td>100</td>
<td>1.00</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>05/Nov/2016</td>
<td>30</td>
<td>0.70</td>
<td>50</td>
<td>1.00</td>
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<td></td>
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<tr>
<td></td>
<td>06/Nov/2016</td>
<td>20</td>
<td>0.60</td>
<td>20</td>
<td>1.00</td>
<td>100</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>06/Nov/2016</td>
<td>10</td>
<td>0.60</td>
<td>10</td>
<td>1.00</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>01/July/2017</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Sales lost: 31 EUR
Total Sales lost in %: 5.961

[Forecast Analysis] [Transfer Price to Digital Display]

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# Status of Transfer Price to Digital Display

1 Article with errors

<table>
<thead>
<tr>
<th>Article</th>
<th>Status</th>
<th>Error description</th>
<th>Navigate to Shelve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Done</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>Digital Display (ID XY212345F) not responding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Done</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Done</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Cola Sales Forecast Analysis

Total Sales lost:

<table>
<thead>
<tr>
<th>Article</th>
<th>Expiry Date</th>
<th>Soon Expired Quant. In pcs</th>
<th>Reduced Price in EUR</th>
<th>%</th>
<th>Original Price in EUR</th>
<th>Total Quant. In pcs</th>
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<td>0.80</td>
<td>100</td>
<td>1,00</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Graph showing quantity over time](image1)

**Recommendation**: Reduce Order quantity

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# Navigation to Shelve

![Image of supermarket shelves](image2)

*Note: The content of the image is not clearly visible due to the format limitations.*
Some picture