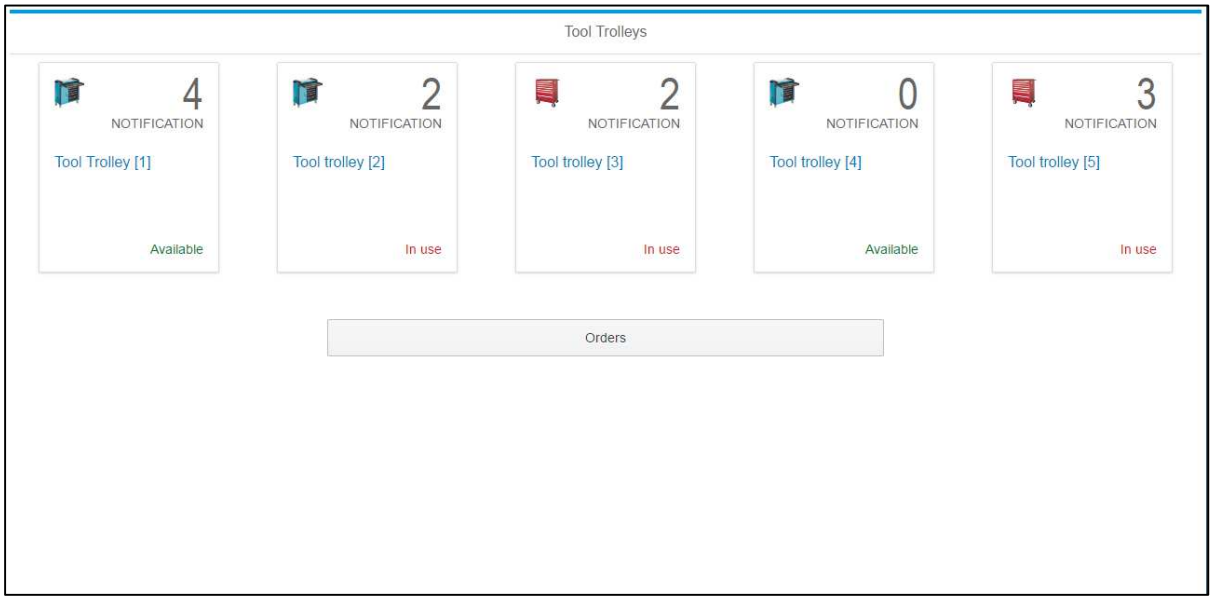
Story:

My IoT prototype is directed towards industrial mechanics. With connected tool trolleys, it is possible to reduce repair and maintenance time, as well as the physical and cognitive stress of the mechanics.

The tool trolley is equipped with Wi-Fi and RFID detection, so you can see the location on a digital groundplan. Special parking areas are reserved for the mobile tool boxes and they provide inductive charging. With Card identification it is possible that only mechanics can use these trolleys. Load sensors are showing the fill level about consumable material such as screws, nuts etc. and triggers an ordering process if some stock level is too small. With RFID technology, every tool in the box is registered. On the first page you can see all orders and which tool trolley is used. New orders can be linked with the best positioned trolley and the mechanics can go fast to the place of action. They don't need to check if everything is okay with the tool trolley, because Sensors and RFID are monitoring the status of availability. On top of the tool trolley is a screen, which shows the same information, like the foreman can see in his office (stock level, charging status, orders etc.). The mechanics can order spare parts and they can view installation manuals if necessary over this screen. In addition with AR glasses they can see step by step instructions to solve problems, directly at the machine. Workload, frequency und executed orders are monitored and give detailed information about repair and maintenance time.

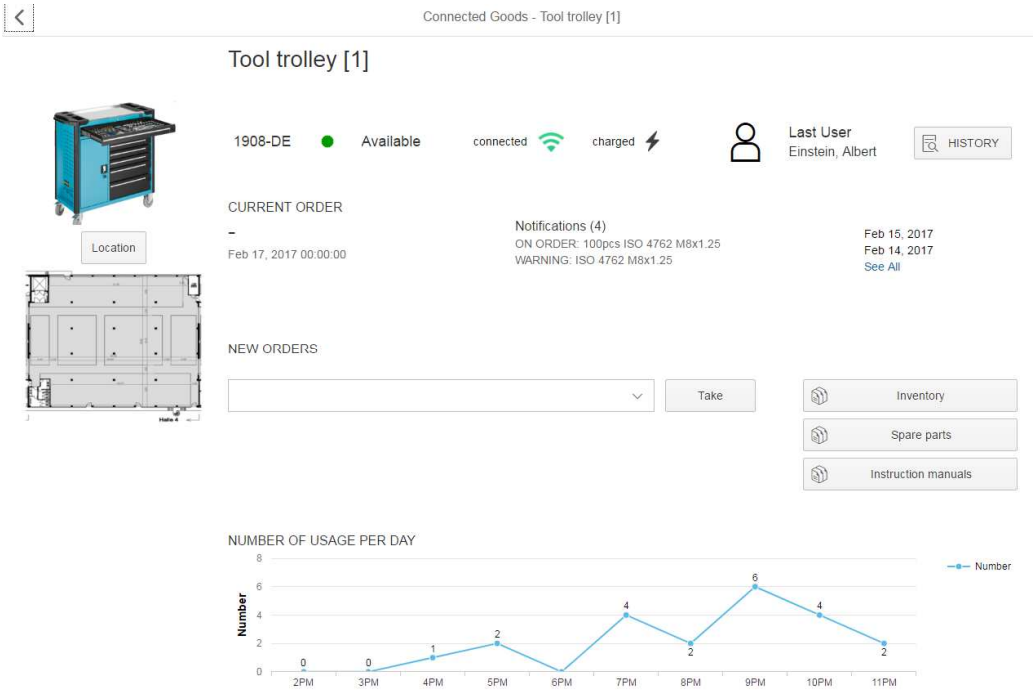
For a better understanding see below some screenshots from my BUILD project.

https://standard.build.me/prototype-editors/api/public/v1/snapshots/7649bc915ce853aa0e177e7d/artifacts/latest/index.html#/launch_page



Screenshot 1: Mainview

You can see on this overview all trolleys and their status. It's perfect for my persona to see which trolley is in use. He can also check all open orders, which are created from the machine operator or are automatically produced from the machine by itself.

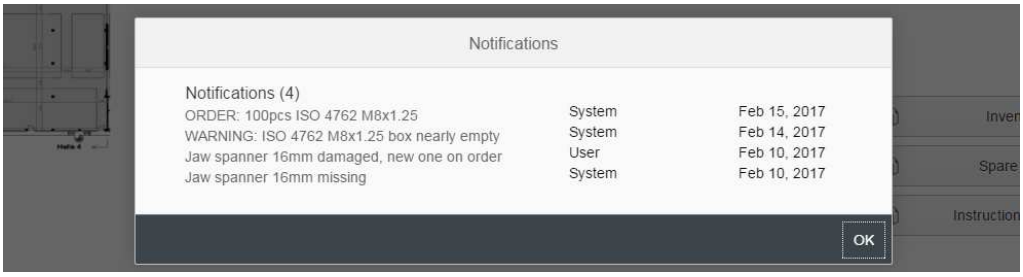


Screenshot 2: detailed view of tool trolley

The second screenshot shows now more details about one trolley. It is the same overview the mechanic can see on the trolley screen. There are information about connectivity, battery status, last user and the current order. The user can also confirm new orders, see the inventory of the trolley, order spare parts and can use instruction manuals if needed.

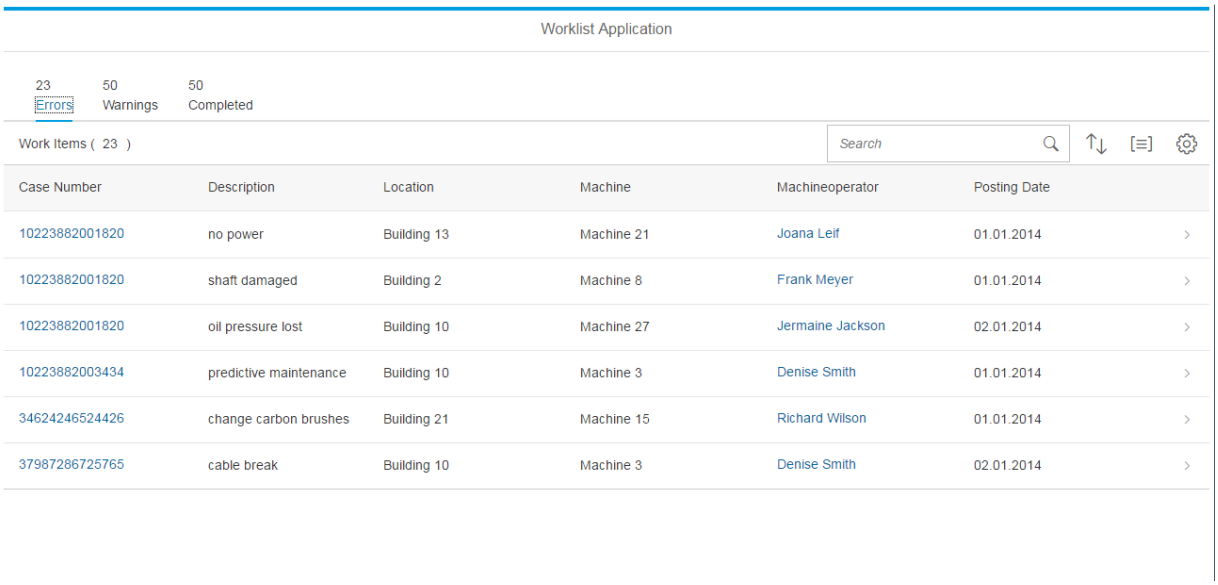
Screenshot 3: information about the location

WiFi and RFID technology are used to get information about the location. So the user can see the position from his work shop or office.



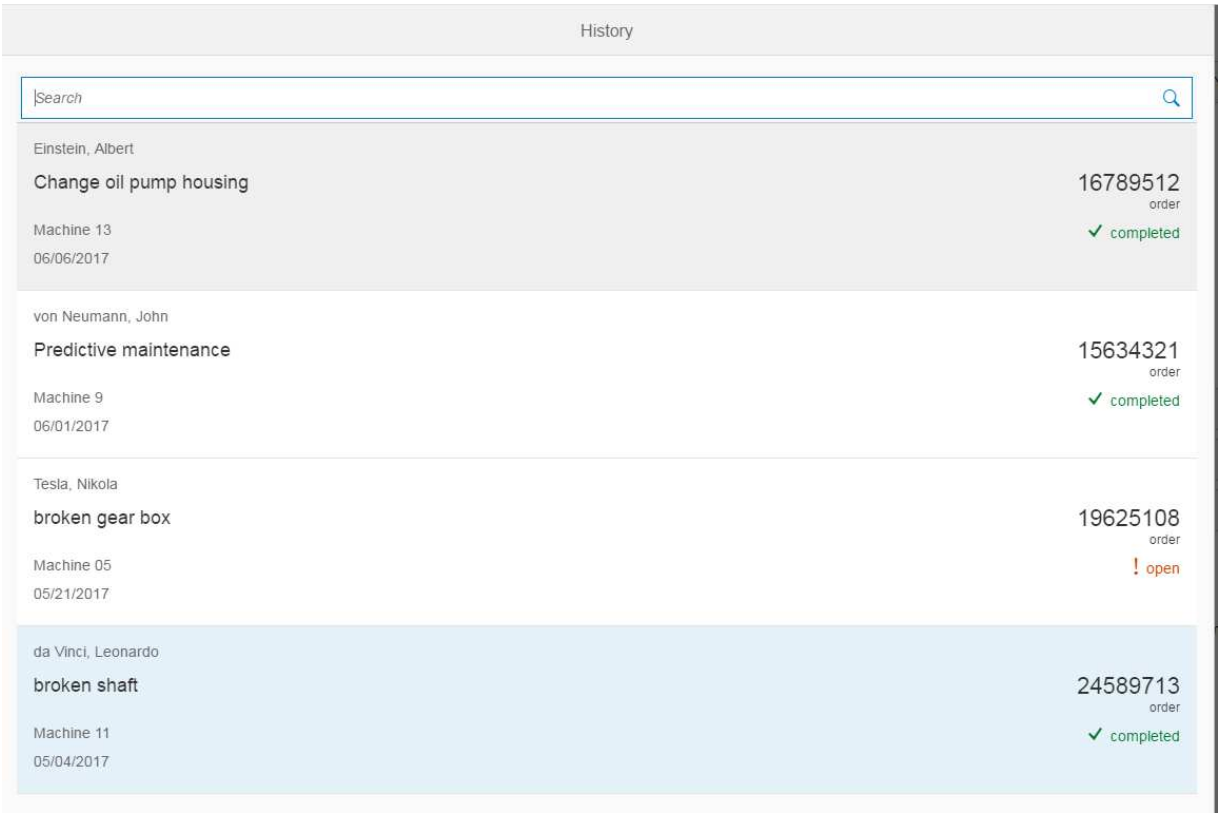
Screenshot 4: notifications

Further there are notifications which show the latest actions.



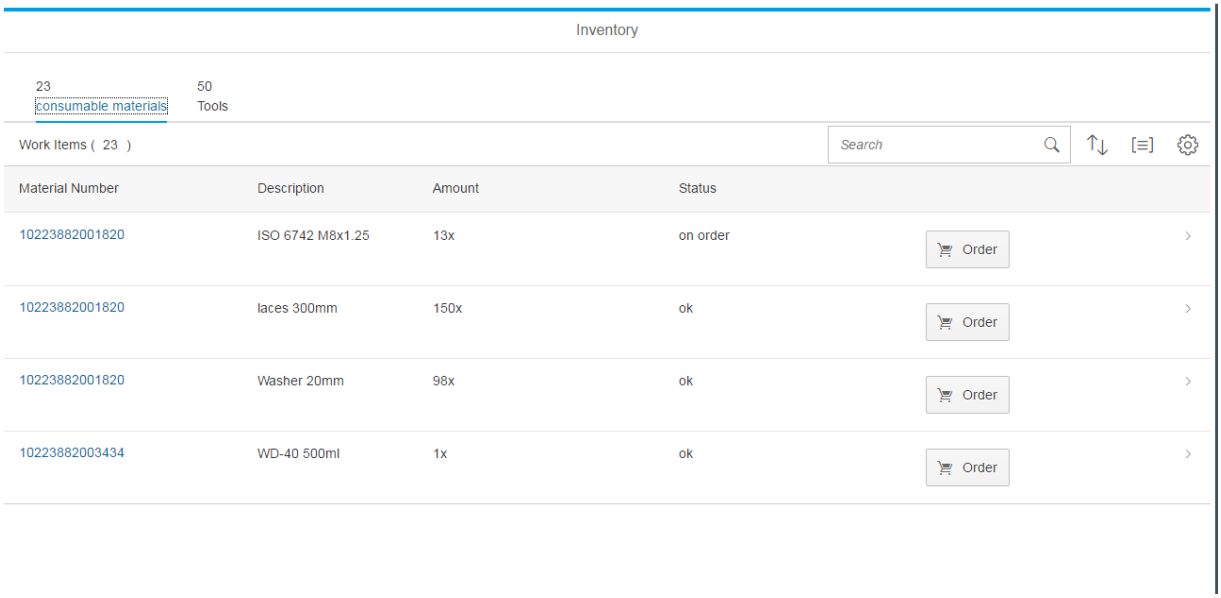
Screenshot 5: open orders

Another important function is the open orders list. The foreman or the mechanic can take one open case and connect it to the trolley. The trolley is than reserved for the person and with more detailed information from the machineoperator, the mechanic can order and receive spare parts before he reaches the trolley or the machine.



Screenshot 6: history

The History shows all cases from the past. They can be completed or open. By clicking on one case, you get more detailed information (it was not possible to create another dialog via BUILD, so this feature is not realized yet).



Screenshot 7: inventory

Finally there is the option to see the inventory of the trolley. With weight sensors and RFID chips all goods are tracked. The user can be sure, that this trolley is fully equipped and ready for utilization.

Persona: Hans

I would like to improve the efficiency of maintenance and repair support, since I am dealing with evermore complex tasks

About:

- 45, married, foreman of maintenance, 25 years of work experience
- Being the person who tells the mechanics off as for a maintenance or repair order
- very mobile, moving from machine to machine during the day
- I work with the CTO, engineers and mechanics

Responsibilities:

- I am responsible for managing the maintenance and repair orders
- I am responsible for having enough spare parts on stock
- I spend some time in my office for managing tasks, but I also help executing maintenance and repair orders

Main Goals:

- reduce maintenance time
- reduce repair time
- better forecast of machine maintenance
- better documentation of down times
- reduce spare parts stock level with better knowledge about failure

Needs:

- I need full availability of all tool trolleys
- I need a simple assignment of mechanics to orders
- I need to know the amount of time spent on a maintenance and repair order
- I need better information about spare parts at the machine

Pain Points:

- spare parts stock management is very time consuming
- Documentation is done at the end of the day, co-workers didn't consider all points.
- ordering process for spare parts and consumable materials must be more efficient
- need instruction manuals at the machine

Point of View:

As a foreman of maintenance I need a way to organize my teams and assign them to orders so that the downtime of a machine is reduced.

As a foreman of maintenance I need a way to control all work tools so that the availability of tool trolleys are given at any time.

As a foreman of maintenance I need a way to document all incidents so that I can learn from past and avoid future incidents effectively.

As a foreman of maintenance I need a way to get more information about spare parts at the machine so that I can execute orders more quickly if needed.

UX Journey:

Actions	• phone call from machine operator • machine down	• looking for a mechanic who is available to solve this problem	• it's a bigger problem at the machine • the mechanic need my support	• go to the spare parts stock and receive the needed part	• repair the machine • make some notes	• testing	• initial operation	• documentation
Mindset	• "not again" • "third time in the last two weeks"	• "I hope he can do this asap" • "I must check the stock level of the spare parts for this case"	• "Physical Work! That's why I love my job" • "I need a mobile tool box and the spare part"	• "That's a long way back to the machine, I hope it's the only damaged part"	• **"**I must order new M8 nuts, they are empty now" • **"**we need binder for some oil on the floor, I must keep that in mind"	• **"**it looks nice"	• "successful test" • "I think the screw on Part X must be tighten with more newton meter"	• "Work is done, but I hate the documentation" • "place order for a new spare part" • "Where are my notes?"
Feeling								
								
Touch Points	• conversation with machine operator	• Warehouse Management System • conversation with mechanic	• mobile tool box • spare parts stock •	• spare parts stock • co-workers •	• co-worker • mobile tool box • machine	• co-worker • mobile tool box • machine	• machine	• office • Computer • notes on paper