Digitalization Humanized

A customer-centric approach to Productivity Tools

The Topics

Bromma Spreader Monitoring System – SMS

- Development methodology
- Problem
- Project highlights – the road to success
- The product in brief

We were early on the scene!

First telescopic spreader

First Smart spreader

First all-electric spreader

First tandem spreader

Predicting spreader issues with AI

Load sensing system

Green Zone for productivity

1965 1995 2001 2003 2007 2010 **2011** Future

We used to do it this way!

Digital service design

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We took a different approach this time!

Customer in focus

Co-creation

Prototype validation

Holistic approach

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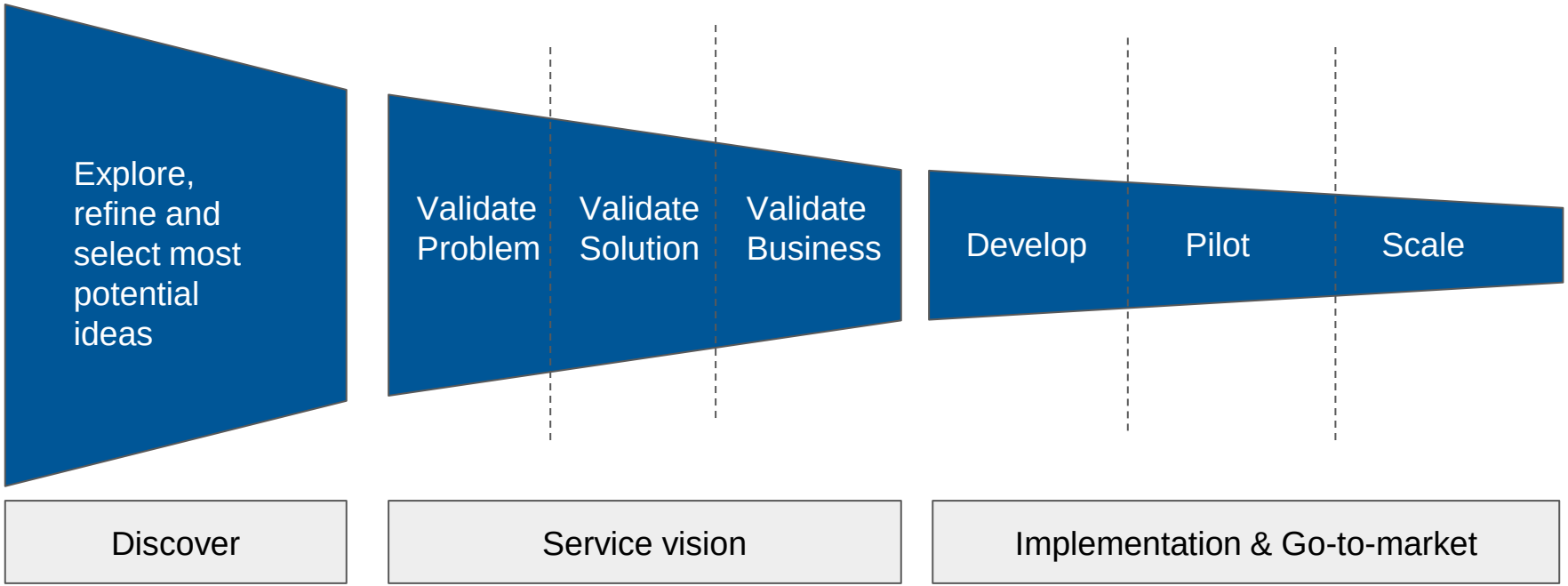
We used Lean Service Creation methodology



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Unscheduled terminal downtime can cost 100’s K$ per year*

30-50% of quay crane downtime is related to the spreader

How to monitor spreaders health and ensure they are functional and ready for operations?

Service Vision

We interviewed 6 engineering teams of our customers to validate the problem

The spreader is moving slowly. Why is this happening? It would be good to digitally monitor and know why.

I'm manually creating reports for managers to make decisions like which spreaders need to be shut down and which spreaders are available to move to which crane.

I have to run an absolutely horrific spreadsheet to calculate maintenance intervals.

You should ideally be able to check failures first before you go and fix it.

It takes a lot of time going back and forth to go to the spreader, check what's wrong, realise you don't have the part, go back to the workshop, get the part and come back to fix it.

Service Vision

Findings helped to define which functionalities to focus on

Set up configurations and integrations adapted to terminals needs

Easily determine what short- and long-term actions to take

Quickly understand how spreaders are doing in one quick glance. Confirm that all is well.

Plan and optimise fleet — to make the most out of it

Ensure all spreaders are functional and ready for operations

Minimize downtime by supporting quick decisions in critical moments

First prototype functionalities validation

Resonates well with all respondents but the statistics are not necessary or different statistics wanted.

Engineering teams are more interested in trends on spreader health and ability to operate than spreader productivity.

Terminals appreciate the one-glance overview of spreaders and warnings. Level of details, links to manuals, and guidance on troubleshooting is generally appreciated.

(Email) alerts to login to the system is appreciated

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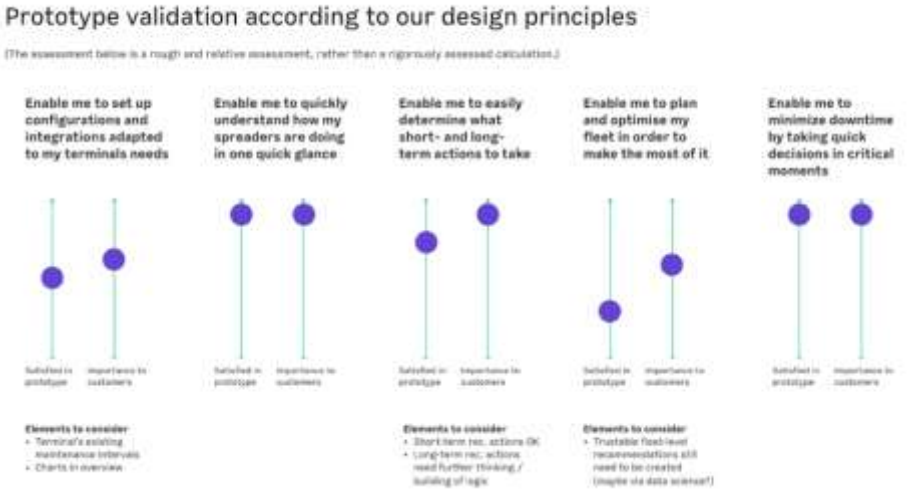
Validation of first prototype & iteration



Overall quite positive, clear and intuitive

This will enable us to send the correct skillset to the spreader the first time.

Overall there are many useful pages there. Providing insight is really useful for technician. Maintenance page too.

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Combining the findings from customer involved prototype validation with technical and business feasibility, we arrived at the following main sections to be part of the Bromma SMS

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Bromma SMS at a glance

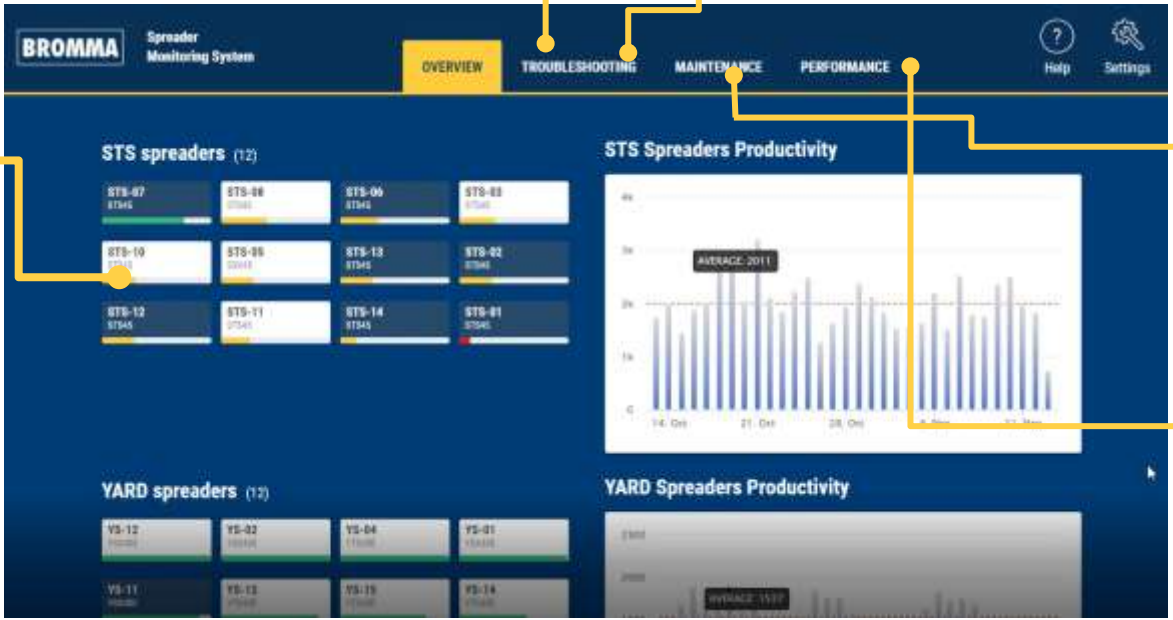
In-depth analysis of specific issues

Easy access to spreader manuals and recommended solutions

Instant overview of the health of each individual spreader in the fleet

Overview of planned maintenance, ability to tailor maintenance, utilization based scheduling

Statistics for the whole fleet and individuals spreaders, which allows more in-depth analysis on spreader performance



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Customer reactions

This enables us to know immediately if there is a fault on a spreader? That's where it becomes very powerful for us.

This is very useful. Providing insights is really useful for technicians.

I think this tool is great! Every terminals that has Bromma spreaders should use it!

Results and Conclusions

- A tool developed on the needs of terminal operators
- Technology used enable continues improvement – also of existing installations
- Very positive results and feed-back from current installations

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