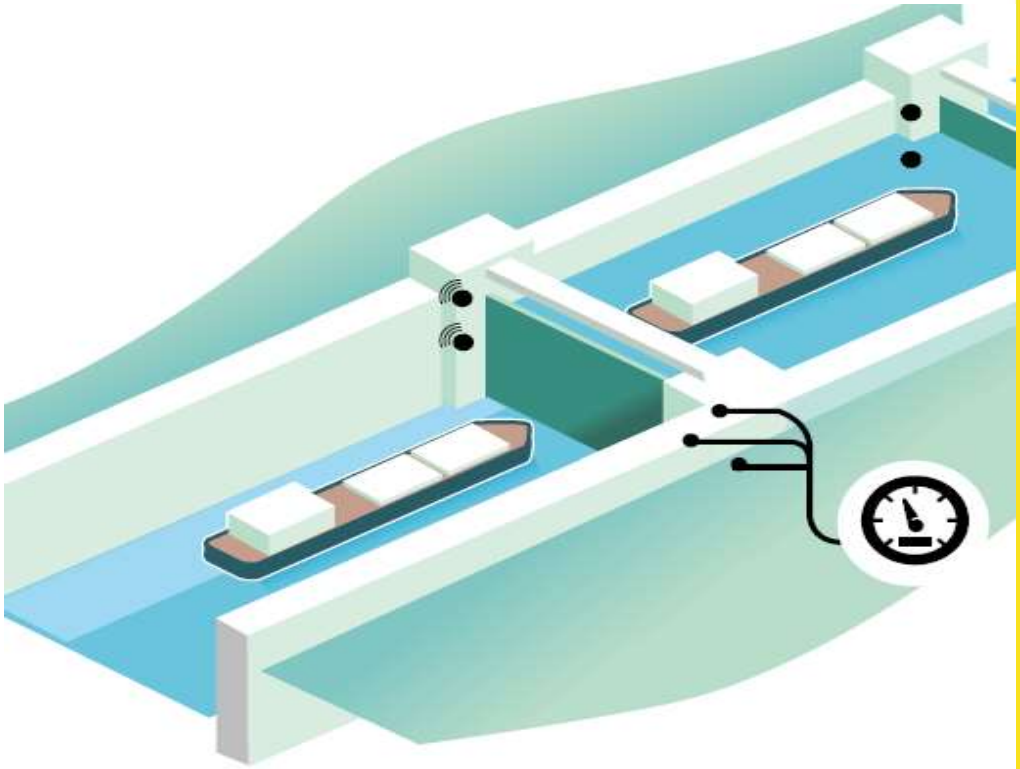
Rijkswaterstaat
Ministerie van Infrastructuur en Waterstaat



Working towards a data-ecosystem for data-driven assetmanagement

Tjeerd de Jong – Rijkswaterstaat

1 februari 2023

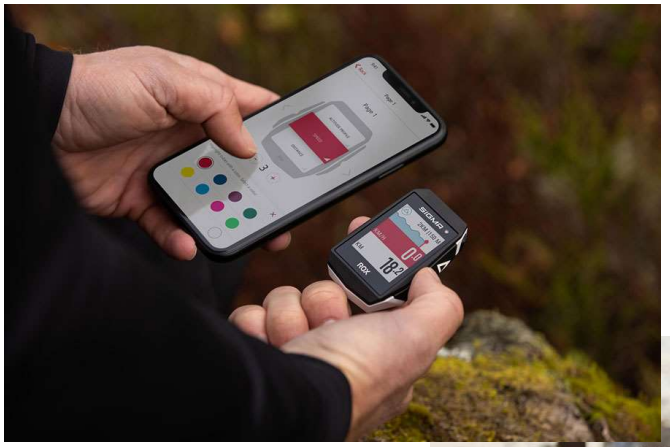
Content presentation

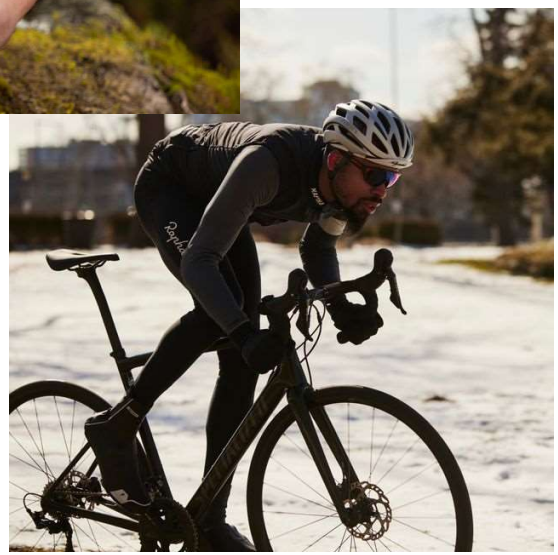
- Introduction
- What is data-driven assetmanagement?
- Making the step from experiments towards production
- Lessons on introduction innovations like data-driven assetmanagement

Me & data-driven

- Tjeerd de Jong
- Program manager data-driven assetmanagement @ Rijkswaterstaat

- Cycling!





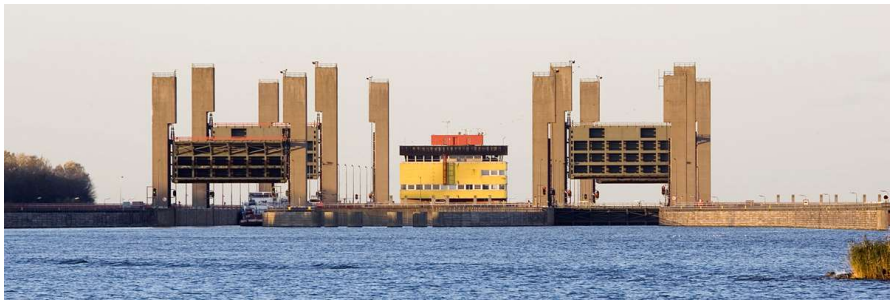
Achieve more using the right data!

Rijkswaterstaat

Rijkswaterstaat is part of the Dutch Ministry of Infrastructure and Water Management and responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands.

RWS maintains ca:

- Ca 30 tunnels
- > 100 bridges
- > 100 locks
- Several great pumping stations

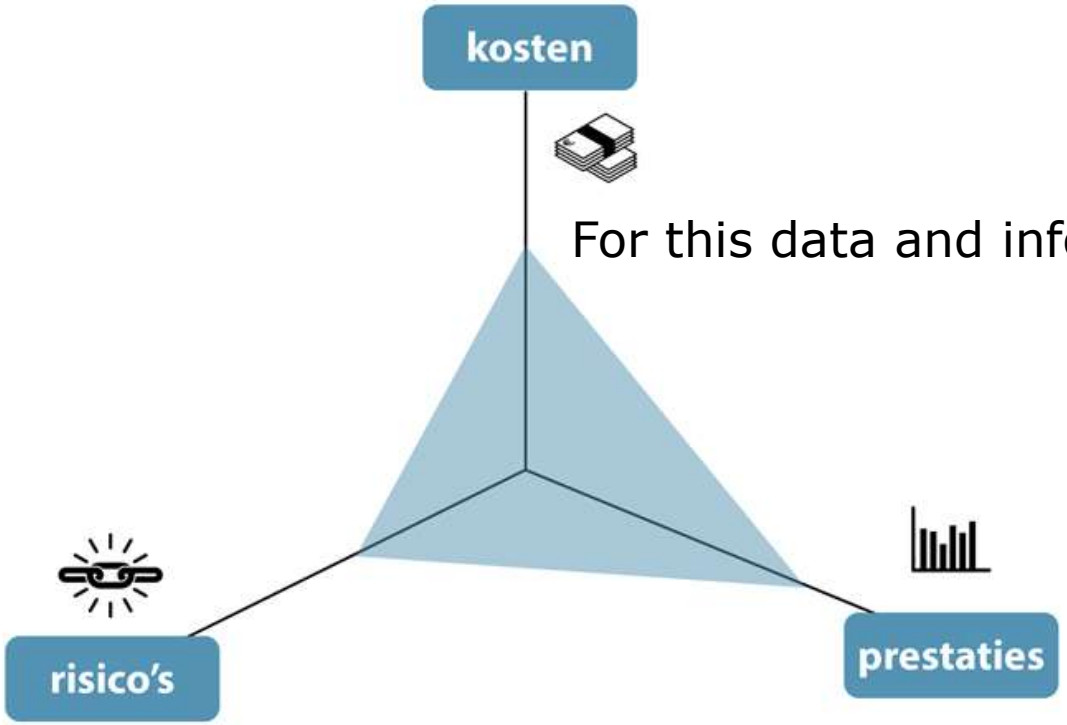


The challenges for Rijkswaterstaat

Keep The Netherlands safe, secure, attractive and accessible, while:

- The infrastructure is aging
- We have to work sustainable (CO2, circular)
- There is shortage in money and expertise
- Minister, parliament and public ask for transparancy and (quick) availability of correct information

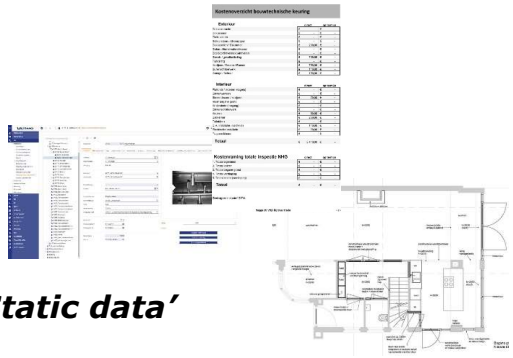
Assetmanagement = making the consideration between costs, risks and performance



For this data and information is needed!

Data supports the assetmanagement of Rijkswaterstaat!

- ‘Static data’ is already available
- IT-innovations ➔ new data sources and new technics voor analysis and representation ➔ more and better information ➔ a better insight ➔ the posibility to make better choices (consideration between costs, risks and performance)
- Through the whole ‘chain of command’ (DG RWS – maintenance engineer contractor)

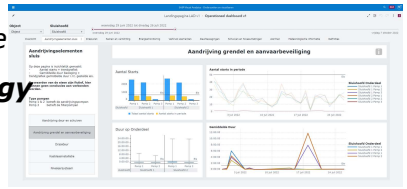


‘Static data’

+

‘Dynamic data’
- *Condition*
- *Use*
- *Performance*

Data technology
- *IoT*
- *AI*
- *Dashboards*
- *Digital twin*



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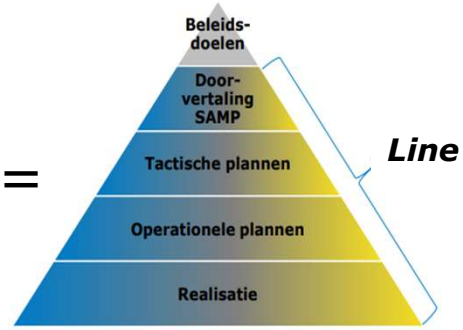


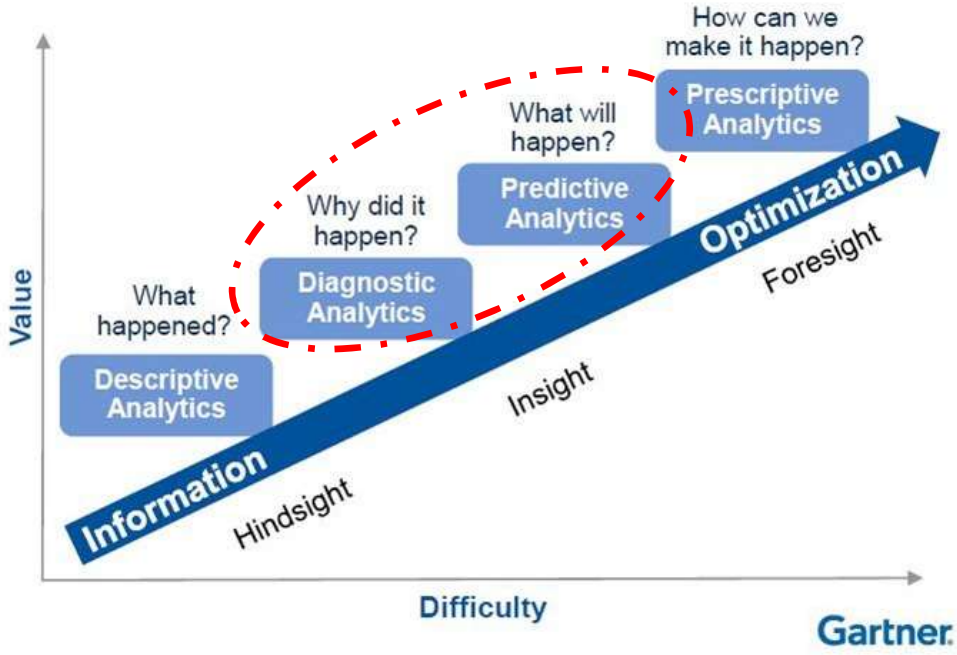
Line of sight

Why data driven assetmanagement?

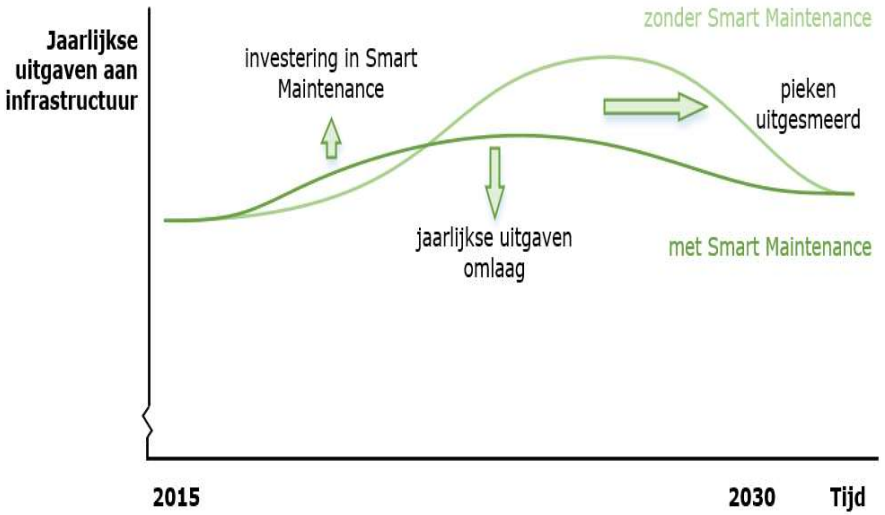
Reduce unplanned disruptions (‘surprises’) for our users and our Minister by creating more opportunities for control in the ‘chain of command’ for assetmanagement.

Therefore we fully implement data driven working in the assetmanagement-system of RWS (process, organisation, people, IT and contracting)

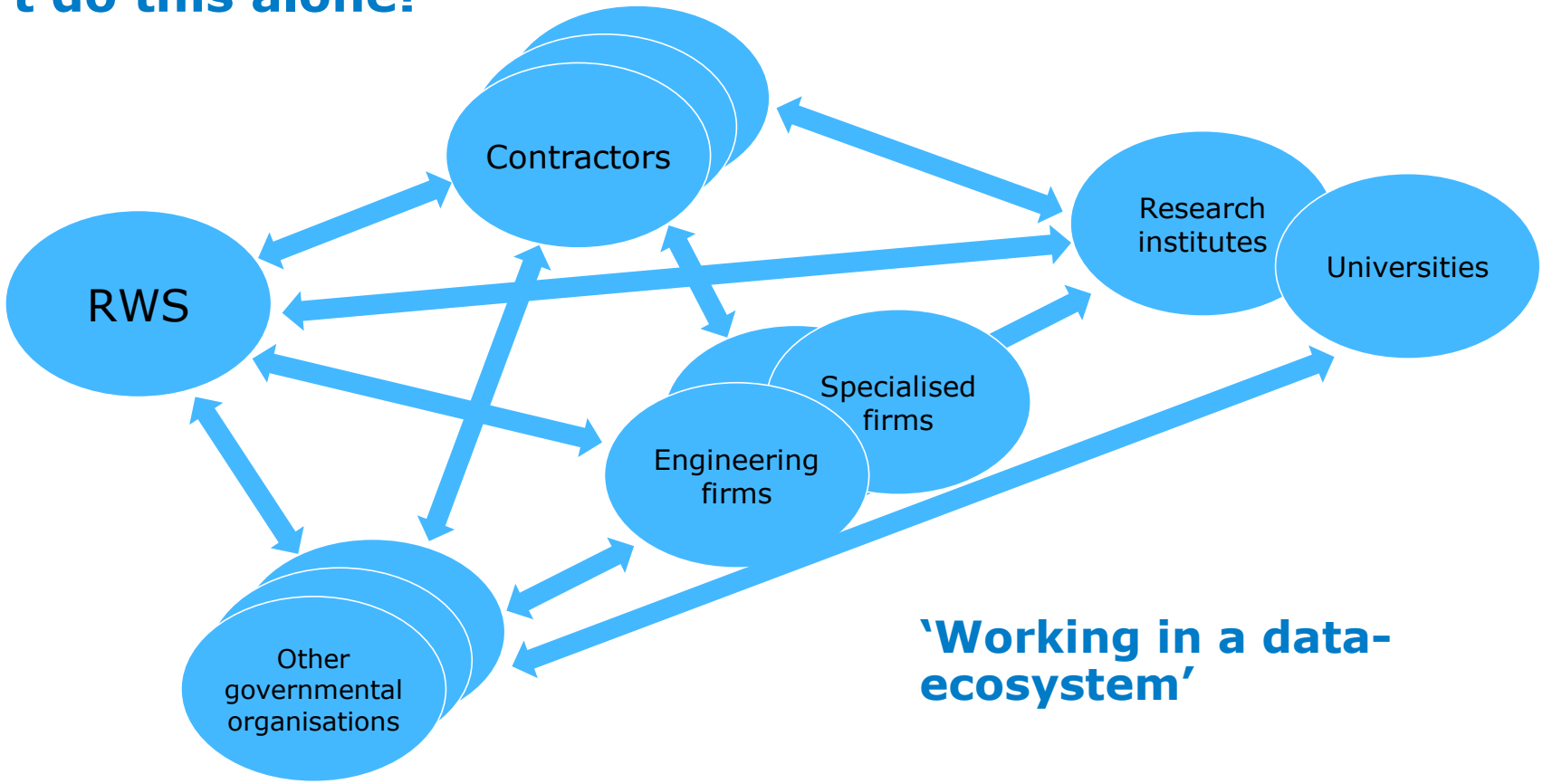
We do this step by step…



… so we will 'flatten the curve'

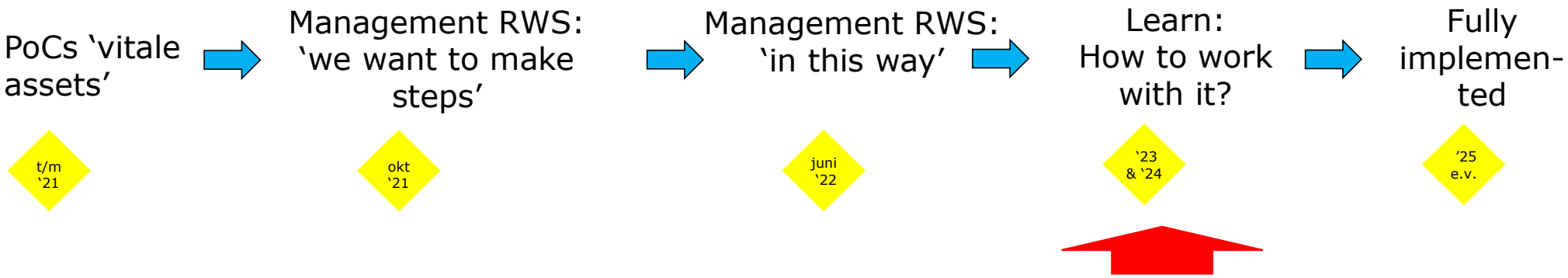


We can’t do this alone!

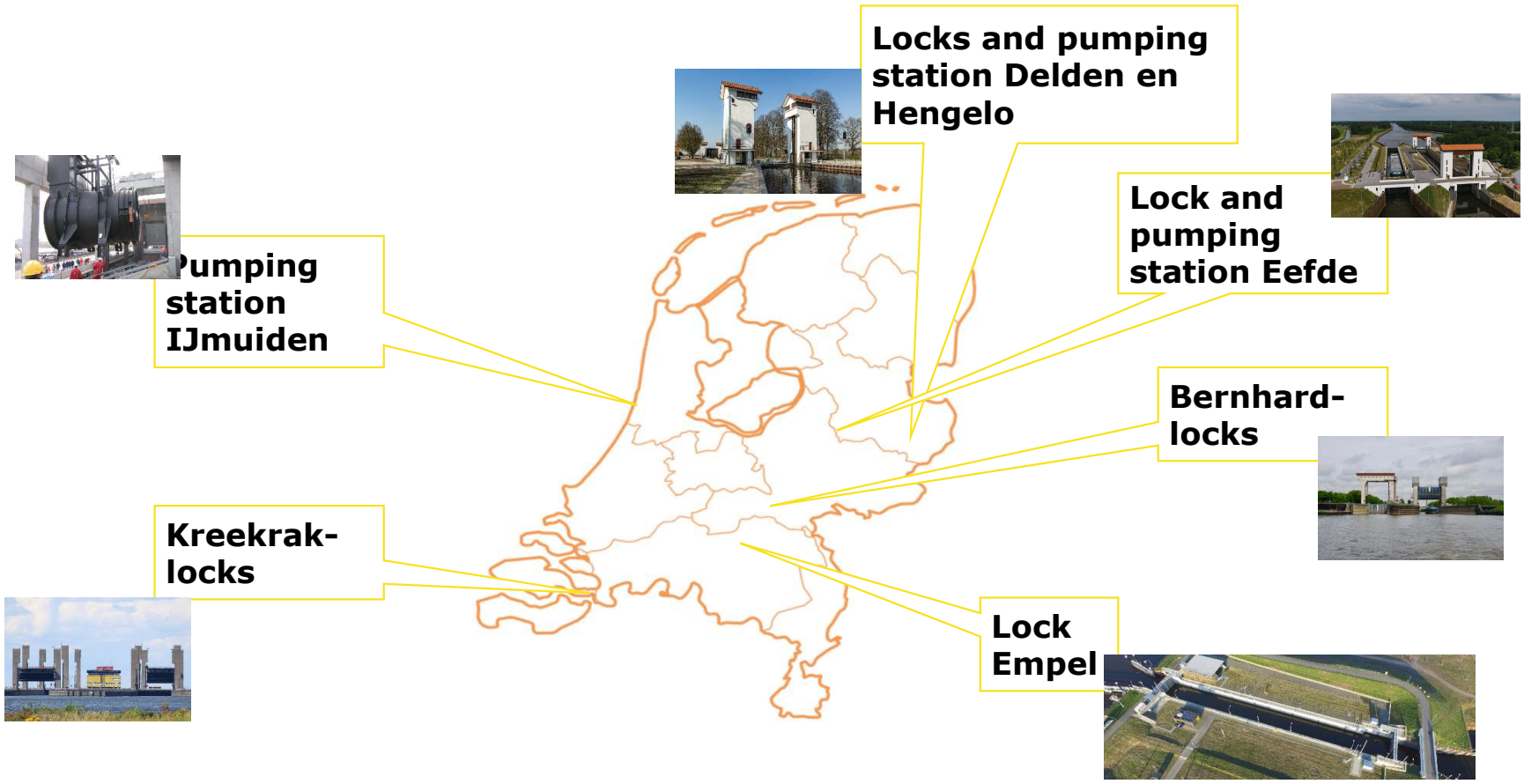


‘Working in a data-ecosystem’

Steps in time



Proof of Concepts – 'vitale assets'



Example IJmuiden

What has been done?

- Extraction data by ODS
- Energy sensors
- Vibration sensors
- Monitoring powertrains pump 5 en 6

Observations ➔ prevented incidents ➔ benefits

- Deviations in new pump ➔ prevention of longer failure and high repair costs for this pump ➔ garantuee discharge function (‘dry feet’)
- Early indication of malfunctions old pumps ➔ prevention of failure and higher repair costs ➔ garantuee discharge function (‘dry feet’)
- Indication of using the pumps at not optimal power ➔ prevention of wastage and extra energy use ➔ lower CO2 emissions, lower costs and extend service life

BENEFITS

Lagere CO2 uitstoot | Lagere kosten | Minder en kortere stremmingen | Imago | Veiligheid | Minder materiaalgebruik

Example
Eefde

What has been done?

- Extraction data by ODS
- Use serveral sensors (power, vibrations)

Observations ➔ prevented incidents ➔ benefits

- Insight in use of the pumps ➔ prevent accelerated degradation
- Early warning boulders in the pump ➔ prevention of damage
- Insight in empty use of the lock ➔ prevention of water loss and lowering energy use
- Insight in cause of malfunctions ➔ prevention of blockage of the lock

BENEFITS

Lagere kosten

Minder materiaalgebruik

Minder en kortere stremmingen

Where has data driven assetmanagement added value?

Step 1

IoT, AI and use of dashboards at tunnels, bridges, locks and pumping stations

Step 1

- Digital twins supporting planning and control in assetmanagement
- Use of big data and AI in maintenance of asphalt
- Use of sensors and digital twins in prediction of lifetime and construction safety of steel and concrete bridges and dikes




Our funnel for implementing new ways of working

Innovate		Uniform	Produce
Research and development the innovation (TRL 1 t/m 4)	**Gain insight into the applicability of the innovation (TRL 5 t/m 9)**	**Learn to work with the innovation Prepare organisation for broad implementation**	**Innovation is part of the regular proces (including an implementation period)**
Is it working in the lab?	***Does it work in practice?***	***How to work with it?***	***We work with it and it's working for us!***

Technology readiness level: Is de innovation ready for application?
Stakeholder readiness level: Is the organisation ready for the innovation?

From experiments towards production

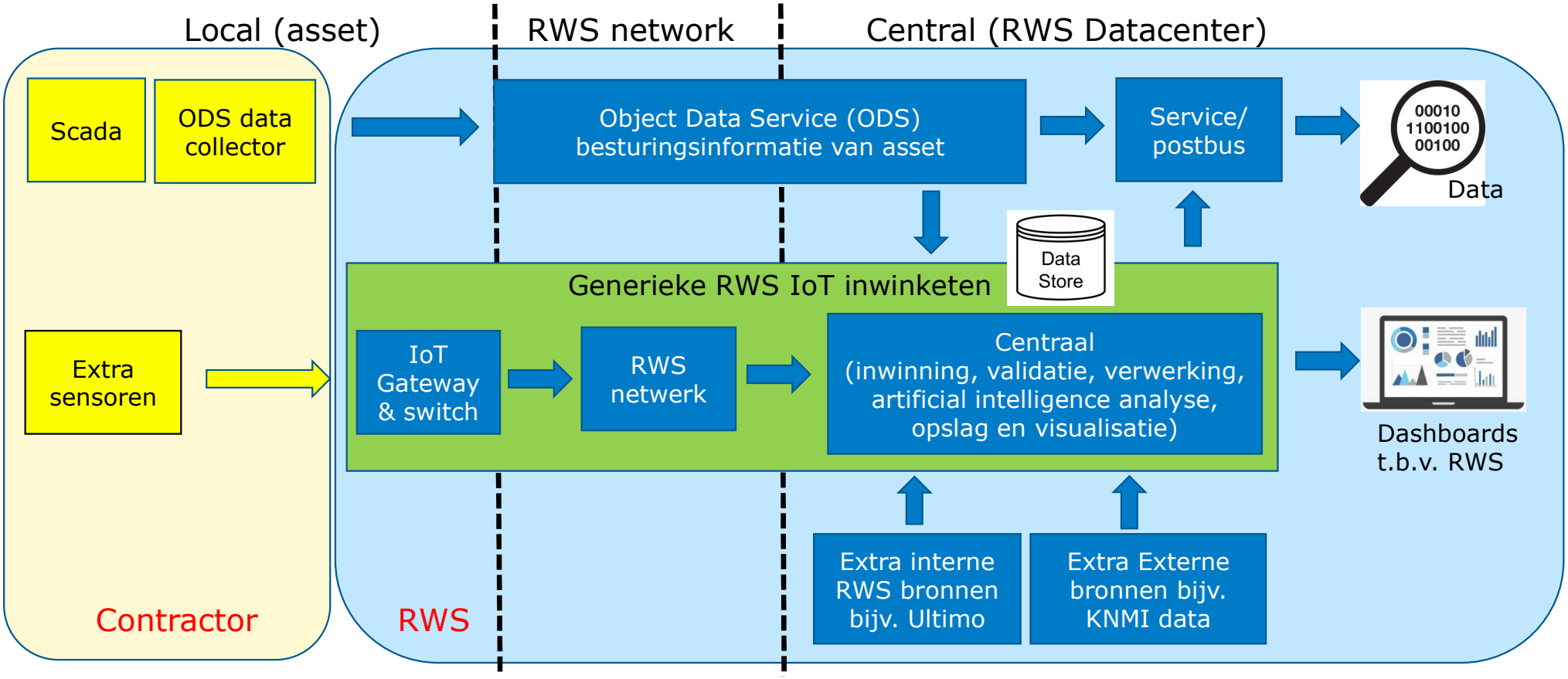
Key question: “How to use it?”

In which way do we use data and data-technology in assetmanagement, so it really helps?

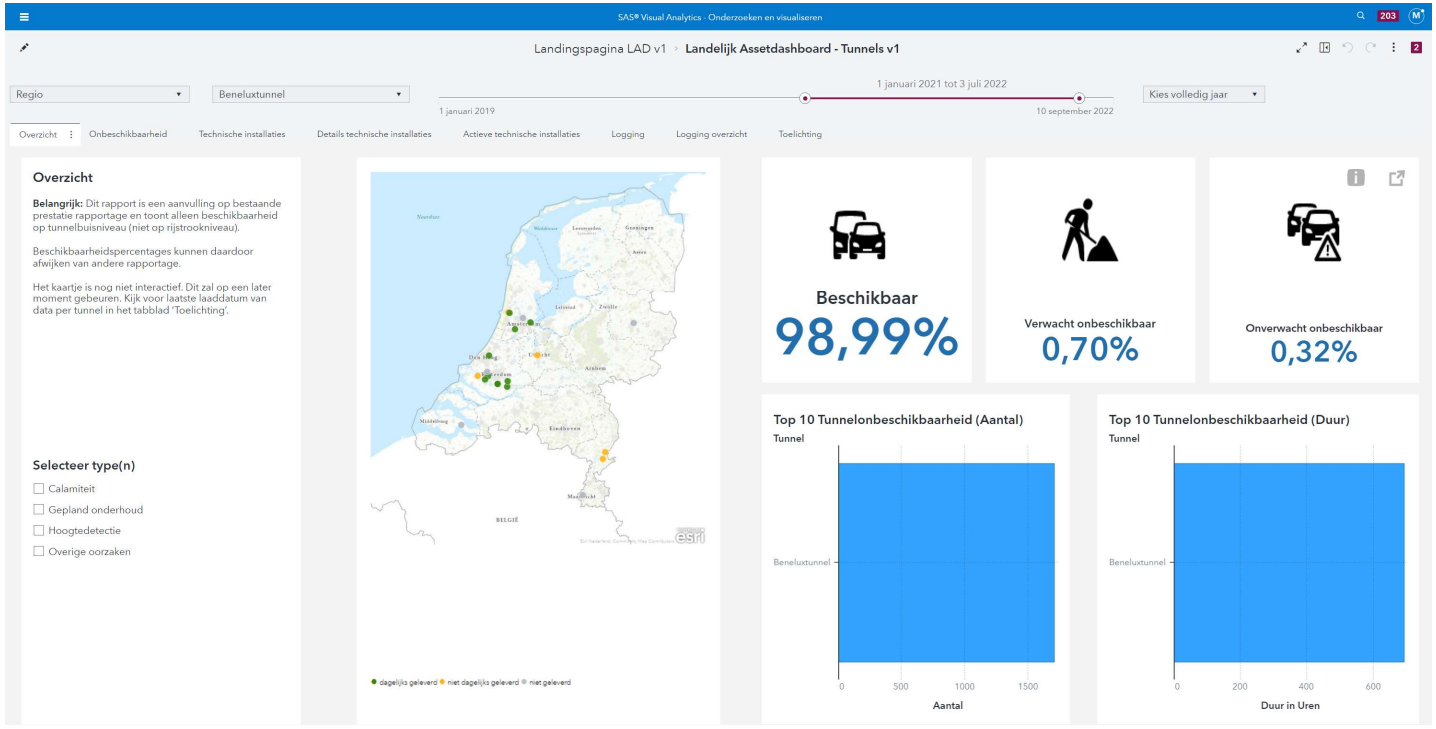
How do we answer these questions?

- **Do** data driven assetmanagement at 6 locations:
  - In the work of the assetmanager (planning), maintenance coördinator and contractor
  - Learn: Which data and information will help? Who uses this information? How do we use this information?
  - Learn: impact on organisation and people (o.a. data literacy)
  - Using the already developed technical solutions
- Develop a standard way of working based on the learnings
- Realise the conditions to make it part of the work of RWS (contract, architecture, frameworks, processes)
- Monitor and sharpen the businesscase

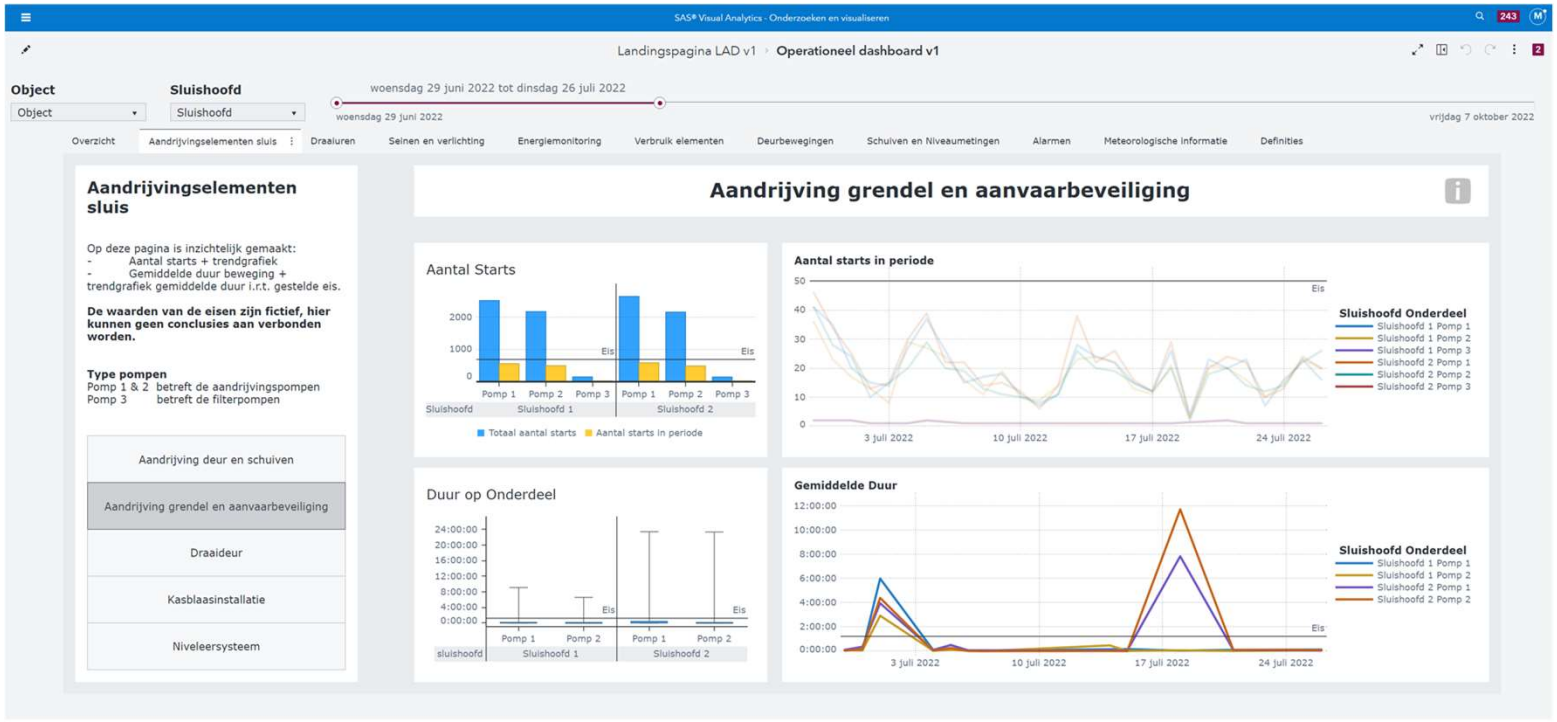
Architecture to collect, process and prevent data



Dashboards - strategic view



Dashboard – operational view



Lessons on introduction

- Who <u>really</u> wants this? (good idea vs I'll use it)
- Focus op means instead of goals
- What is the real change?
- Attention for 'does it work?' instead of 'how do we use it?'
- Involvement line organisation
- Innovation as an add-on
- The human and cultural factor