NSVA

NSVA's Data Management Journey:
A people centric management system

SWAN Digital Water Pavilion
Aquatech Amsterdam
2023-11-07

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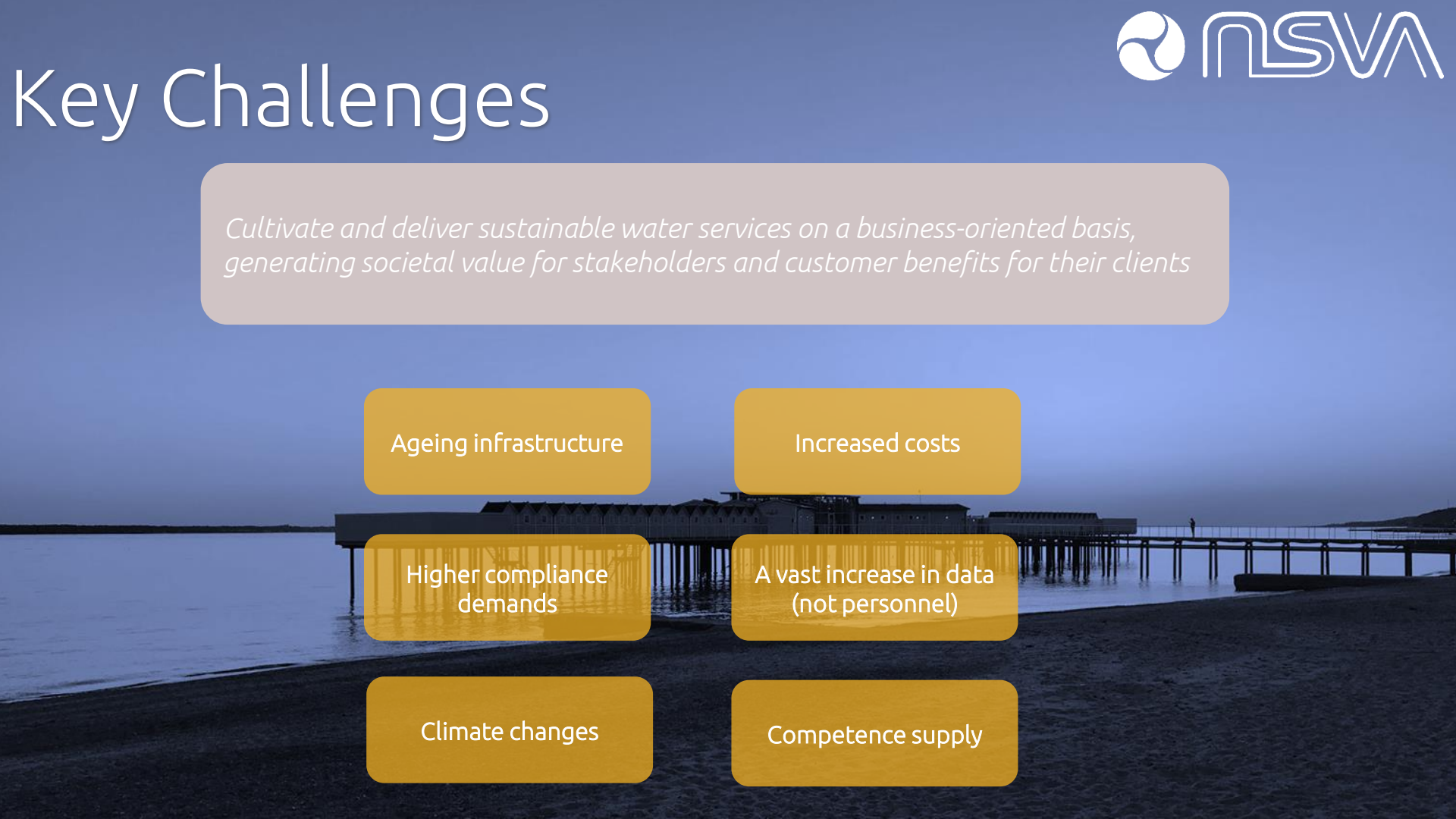
Key Challenges

Cultivate and deliver sustainable water services on a business-oriented basis, generating societal value for stakeholders and customer benefits for their clients



Key Possibilities

Cultivate and deliver sustainable water services on a business-oriented basis, generating societal value for stakeholders and customer benefits for their clients

Information exchange/ collaboration

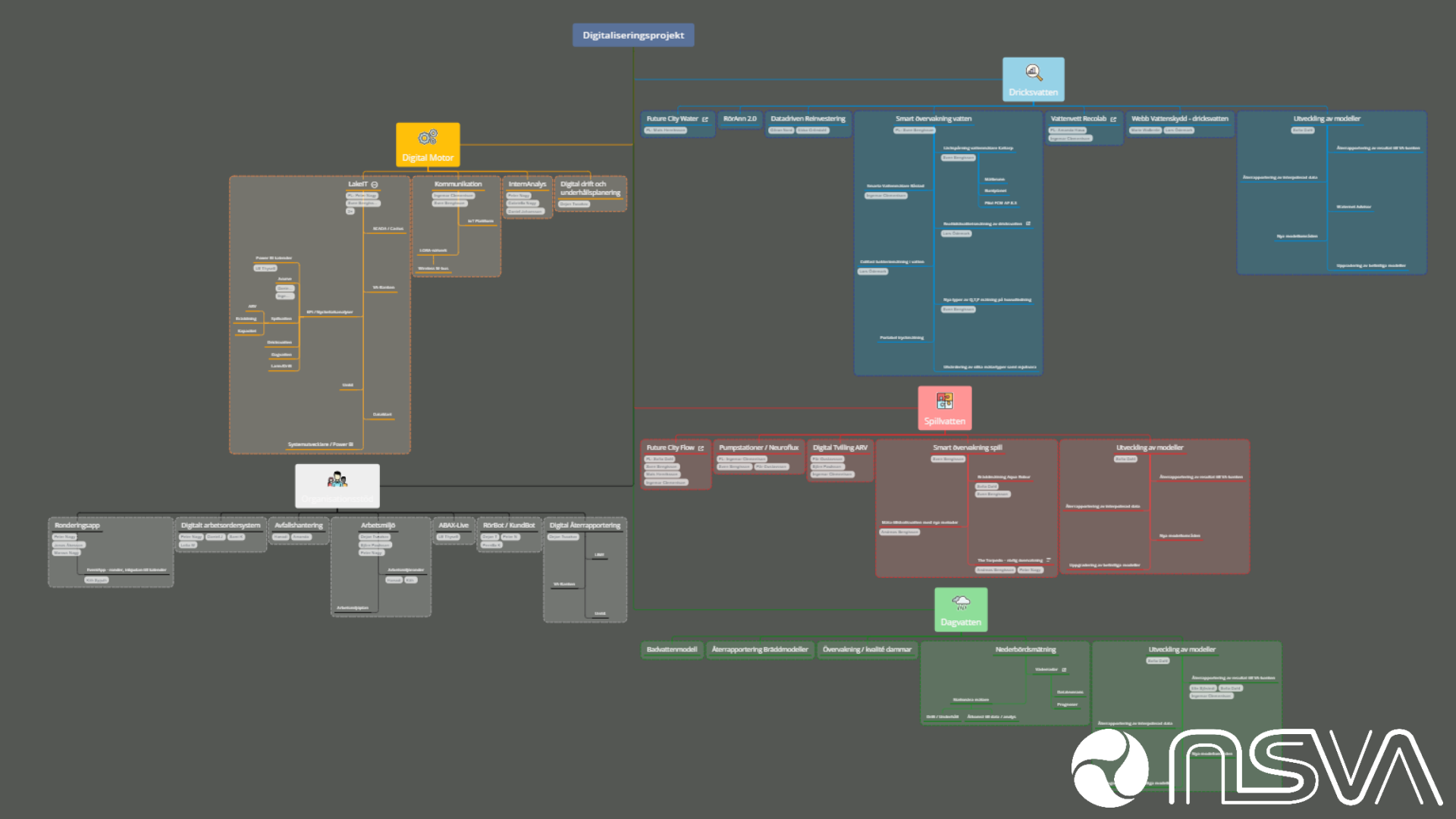
Technically profficient suppliers

Better insight from existing data

AI and large language models

Large scale IoT monitoring

Technical development


Digitaliseringsprojekt
Digital Motor
LakeIT
Kommunikation
InternAnalys
Digital drift och underhållsplanering
Dricksvatten
Future City Water
RörAnn 2.0
Datadriven Reinvestering
Smart övervakning vatten
Vattenvett Recolab
Webb Vattenskydd - dricksvatten
Utveckling av modeller
Spillvatten
Future City Flow
Pumpstationer / Neuroflux
Digital Tvilling ARV
Smart övervakning spill
Utveckling av modeller
Dagvatten
Badvattenmodell
Återrapportering Bräddmodeller
Övervakning / kvalité dammar
Nederbördsmätning
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Digitalt arbetsordersystem
Avfallshantering
Arbetsmiljö
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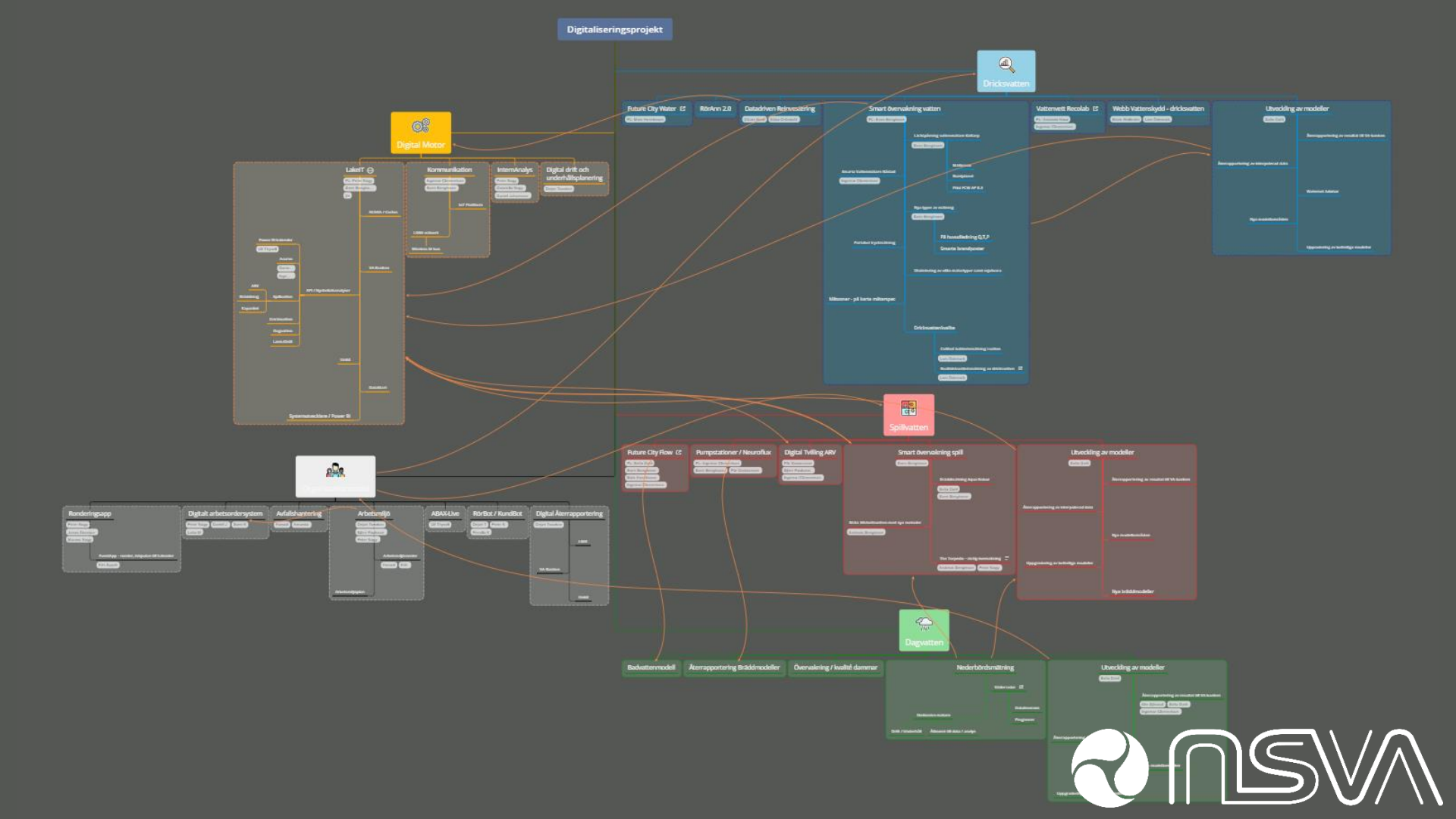
RörBot / KundBot
Digital återrapportering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GOALS	
25 000 IoT devices	2030
Sensor meter workshop	2023
Big data management platform	2023
Anomaldetection and predictive maintenance on all our sensor data	2027,5

Measurment & Monitoring 2030

Where do we measure?

Refinement of existing data

- How can we assess the quality of current data?
- Can we improve historic data with ML?
- What do we need to measure to complement existing data?

Optimization of measurement effort

- Pipe network and geographical data --> hydraulic influence
- Combination of existing hydraulic models and other tech
- Automatically find erroneus physical measument (backmodling historian)

The measuring sweet spoot

- When does more measument stop increasing value/ knowledge?
- Spatial portioning based on water type

IoT-Monitoring

New ways of measuring

- Procurement of new ways of measuring
  - Level measurment IoT
  - Smart fire hydrants
- Smart water gauges
- LORA-network
- Complement in-house measurments in facilities

Sensor meter workshop

- Evaluation of new equipment
- Who recieves alarm and who acts?
  - Responsibilities
  - Priorities
- New competences
- New Equipment

Protocols for communication

- Needs to be "future-proof"
- MQTT
- Relation with protocols in SCADA-system

Intellegence and infrastrcture

Safe communication and data management

- Consumption of external data - to where and safely
- Firewalls within domain
- Operations during a crisis
- API calls - incoming and outgoing

Data management

- Effective management of large volumes of time series data
- Management of systems and responsabilities
- Technical best practice - future proofing
- Visualization and access to data
- Analysis of large amounts of data in all formats
- Scalability
- Effective exchange of data between organisations

IoT-platform

- QUICK integration to devices
- Provide data to IoT APIs
- Integration with existing data
- QUALITY CONTROLL

Machine Learning / AI

- Predictive maintenance
- Prognoser for events
- Data quality improvement - deviations

Alarm Management (or adequat amount of information)

- Prioritizing of alarms
- Information to customers
- Meldingar alarm systems

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Research application WANDA

NSVA Internal Development

External competence

A large number of possible providers

Project Participants

SENSATIVE

IoT Integration

backtick TECHNOLOGIES

Data Management & Product Development

nsva

sweden water research

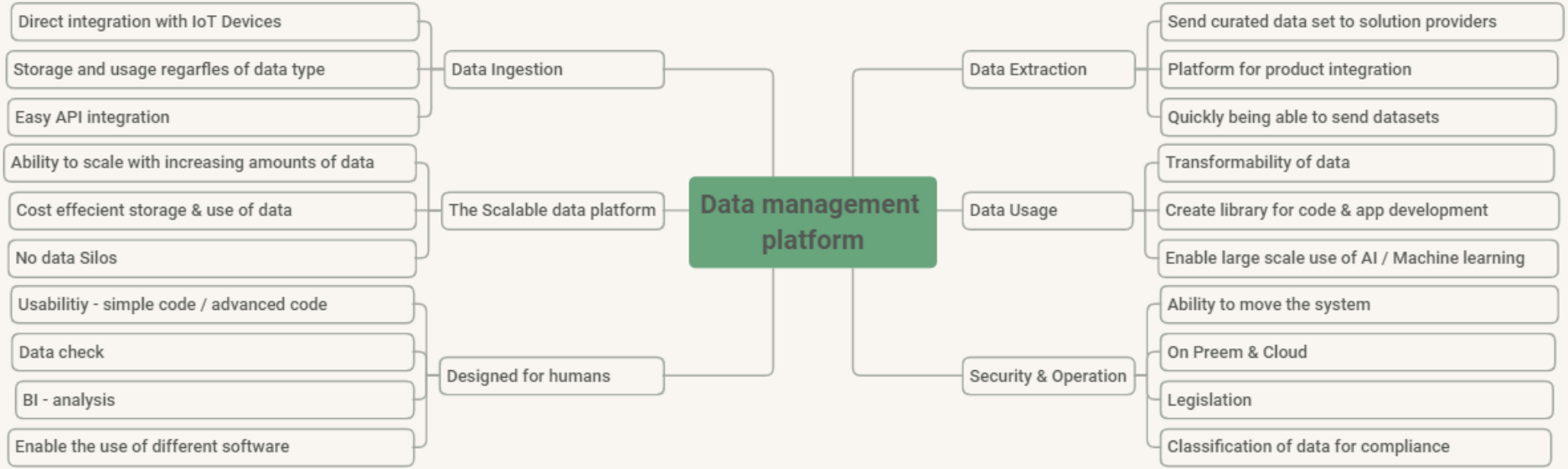
Data & Problem Owner

cinter

BIG DATA, SIMPLIFIED.

Final Product & Startup

Key Components



UX Interviews

CINTER

User interviews

Intervju kring dina erfarenheter av att använda data!

Bakgrund

I projektet "IoT & Datanalys" är utmaningen att framtidssäkra NSVAs data-infrastruktur samt möjliggöra användandet av befintliga och framtida data genom olika tjänster och tekniker. Backtick Technologies utvecklar en dataplatform (Cinter) där målet är att erbjuda så bra "data experiences" som möjligt.

Syfte

Genom flertalet intervjuer hoppas vi kunna kartlägga vilka tjänster och produkter som behöver förbättras och nyutvecklas. Fokus i dessa intervjuer är UX (User Experience) och vi vill lära oss mer för att kunna utforma platformen och kringliggande produkter så bra som möjligt.

Vi hoppas lära oss

Vilka utmaningar som finns i nuvarande och kommande interaktioner med data, bla:

- vad orsakar frustration i nuvarande system, visualiseringsverktyg och rapporteringar?
- vilka behov finns och hur kan vi utforma lösningar på bästa sätt?
- vilka framtida möjligheter det kommer krävas verktyg för?

Intervjuerna

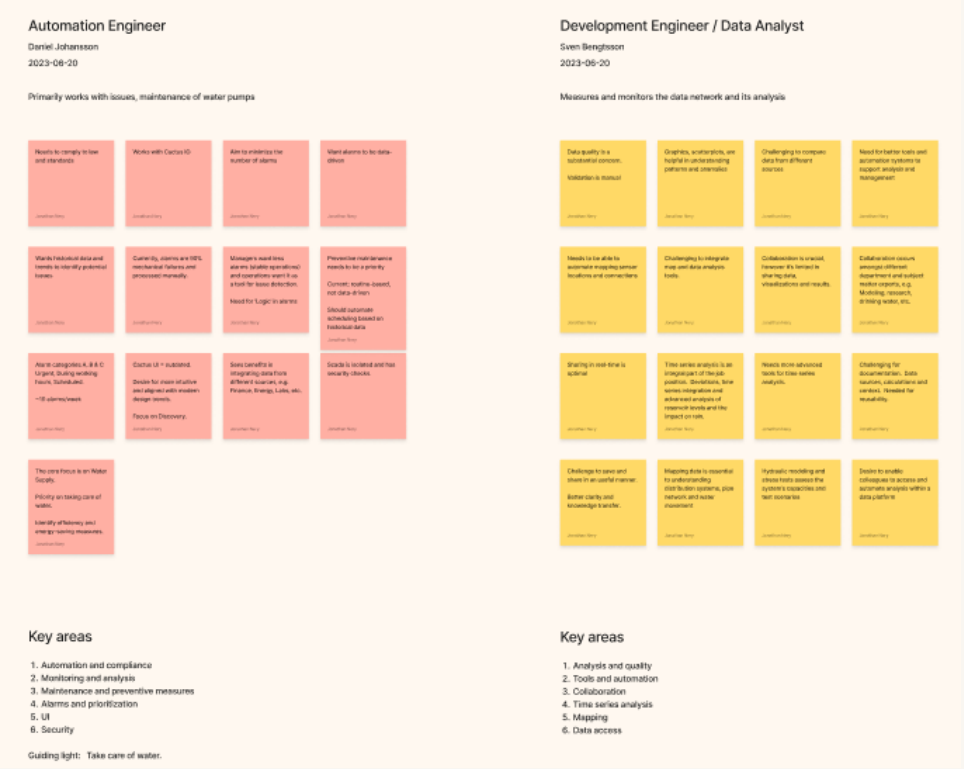
Tar cirka 45 minuter och genomförs av Jonathan Nery och Oskar Handmark.
Inga förberedelser krävs.

Tack! 😊

Jonathan Nery
UX Designer
j@nery.se

Oskar Handmark
Founder
oskar@cinter.io

UX mapping



Automation Engineer

Daniel Johansson

2023-06-20

Primarily works with issues, maintenance of water pumps

Key areas

1. Automation and compliance
2. Monitoring and analysis
3. Maintenance and preventive measures
4. Alarms and prioritization
5. UI
6. Security

Guiding light: Take care of water.

Development Engineer / Data Analyst

Sven Bengtsson

2023-06-20

Measures and monitors the data network and its analysis

Key areas

1. Analysis and quality
2. Tools and automation
3. Collaboration
4. Time series analysis
5. Mapping
6. Data access

Does not help that they are entered into Autodesk, becomes a parallel system. (DVG format)

Jonath

Challenge: unsure who is responsible for updating the data

Jonathan

Significant manual reporting using Excel and PDF formats.

Some reports have a retention period.

Jona

Would like to be able to link to Campaign metrics (Municipality, specific city areas), as well as rain flow, temperature, rain

Jonathan Nery

Data errors come in the form of:

- issues with the physical meter/sensor (e.g. they need to be cleaned off)
- different types of meters/sensors may produce nonuniform results.

Jonath

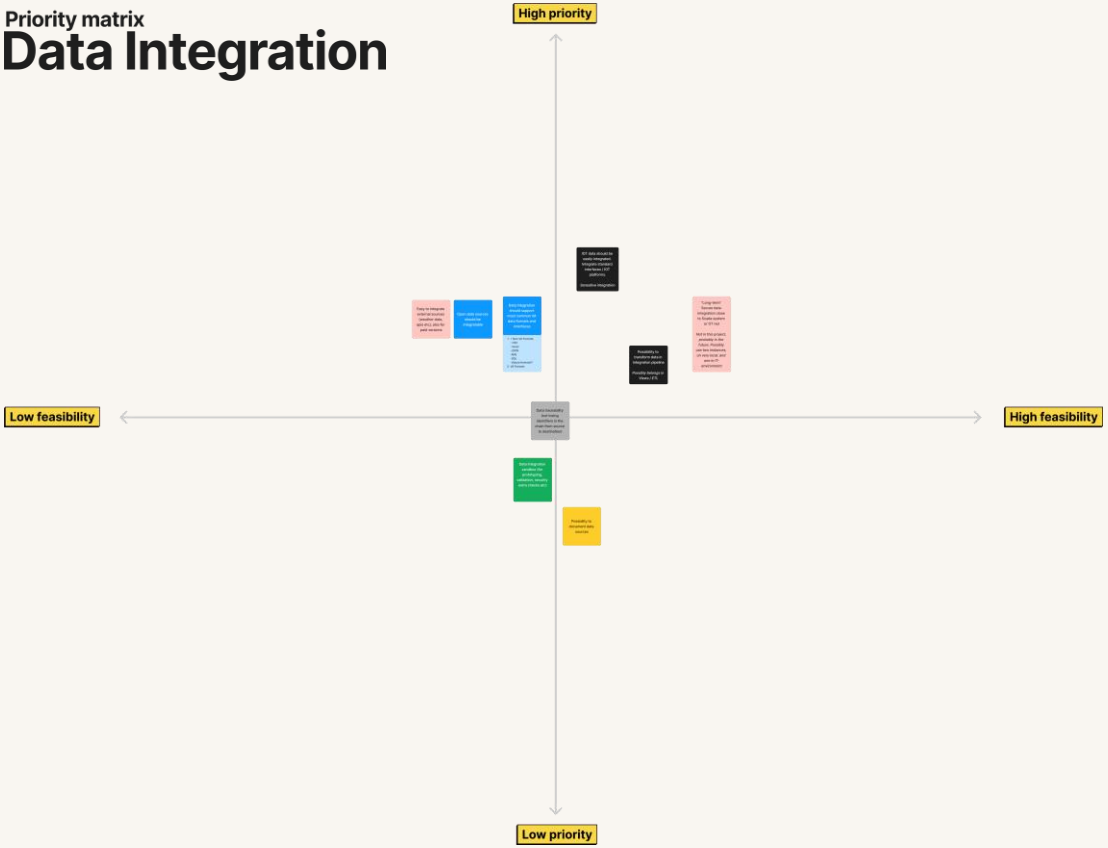
Maps and GIS play a key role to the organization, 50% of employees use maps daily.

Jonathan Nery

UX Mapping

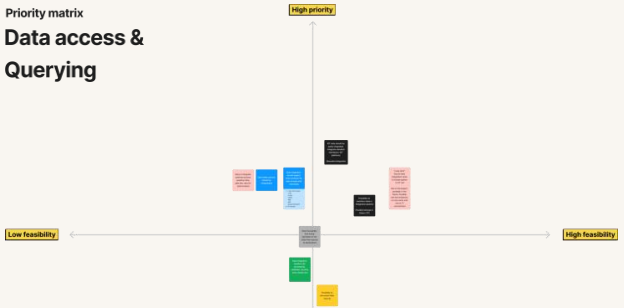
Priority matrix

Data Integration



Priority matrix

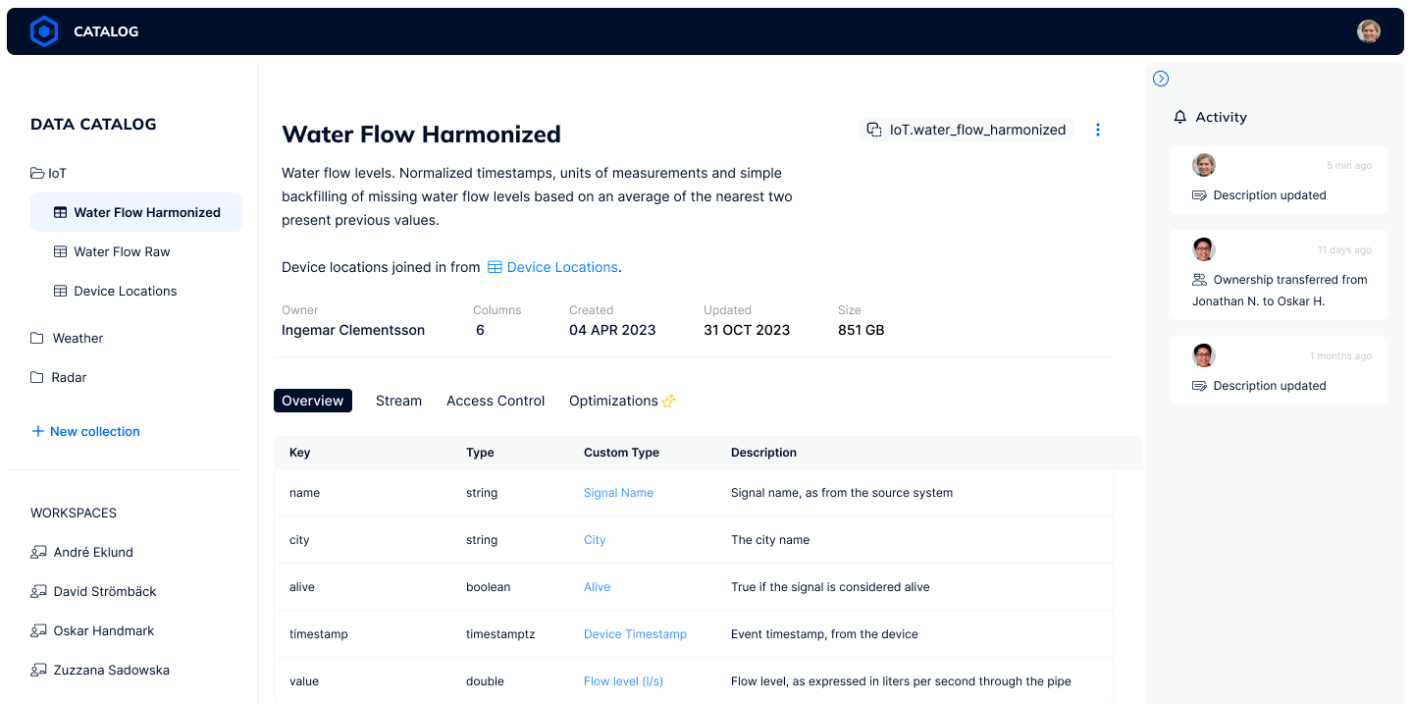
Data access & Querying



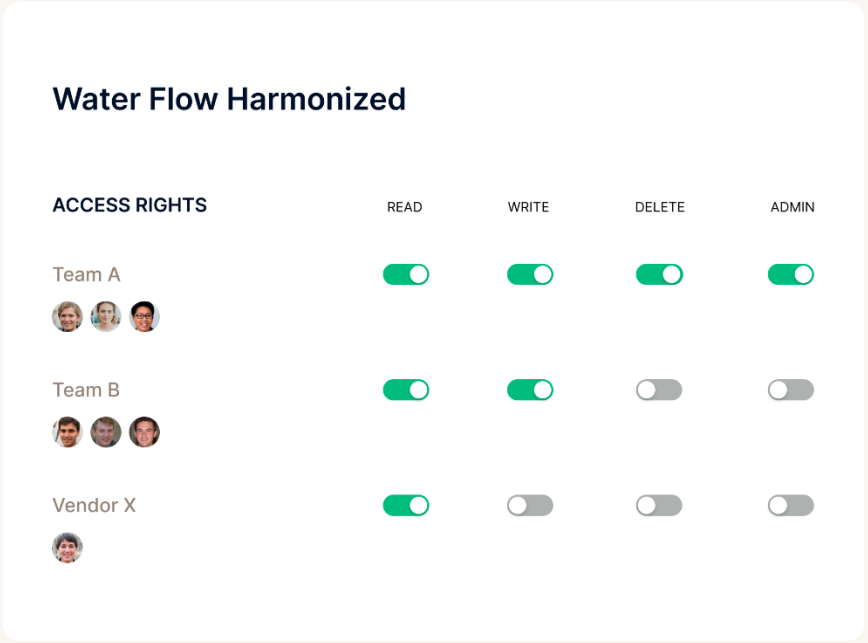
Priority matrix

Data Security & Governance

Data Catalog & Communication



Security & Data Distribution



CENTRALIZED DATA SECURITY

Cinter secures both dataset documentation, metadata and actual data with role-based access control (RBAC) policies.

SSO | Active Directory, LDAP | OpenID, SAML

MAJOR OPPORTUNITIES

- Pay-per-use not economical for volume
- Buyer fatigue for costly cloud solutions

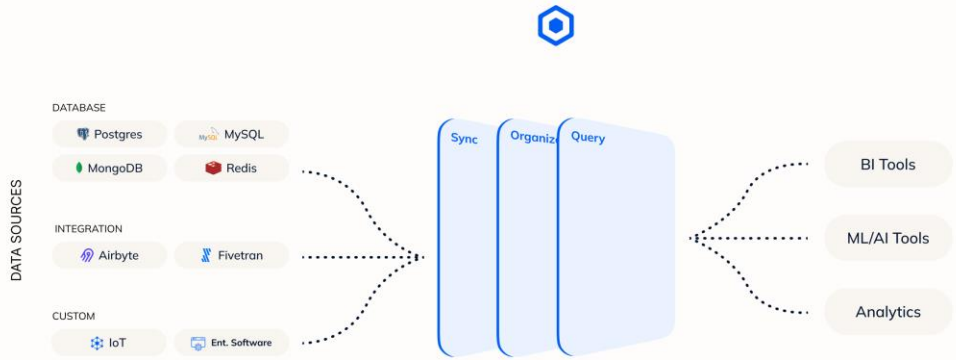
OTHER OPPORTUNITIES

- Better user experience, more human
- EU-friendly (GDPR, Cloud Act, etc.)
- Options beyond the cloud

CLOUD | ON-PREM

MODERN & OPEN DATA LAKEHOUSE

Sync data from multiple sources • Organize and document data in the data catalog • Query data of all shapes and sizes with SQL



cinter

BIG DATA, SIMPLIFIED.

Research application WANDA

WANDA *Water ANomaly Detection Application*

- Identify and automatically refine low-quality data for usability
- Understand factors affecting data quality by combining diverse data sources
- Facilitate the structuring of qualitative datasets

- Apply ML models to detect complex anomalies
- Allow users to enhance anomaly detections models through manual feedback

- Improved understanding of data quality and reasons for anomalies

DHI

Flow Below

VAMAS

VINNOVA

backtick TECHNOLOGIES

sweden water research

NSVA

End Goal

Cultivate and deliver sustainable water services on a business-oriented basis, generating societal value for stakeholders and customer benefits for their clients

Digital Transformation

Competence Supply

Professionalism