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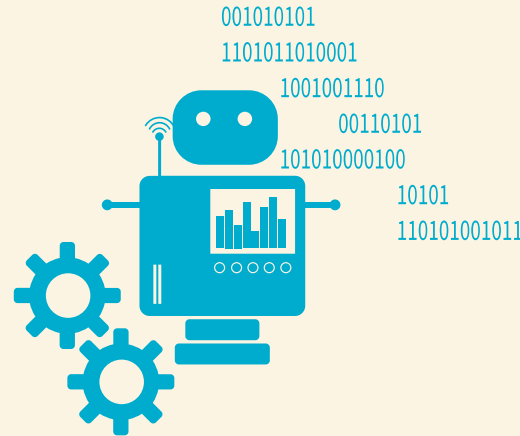
Digitalisering i vannbransjen



Jon Røstum

Sjefstrateg Volue Infrastructure

Skal dere bare huske 1 slide i dag.....



DATA

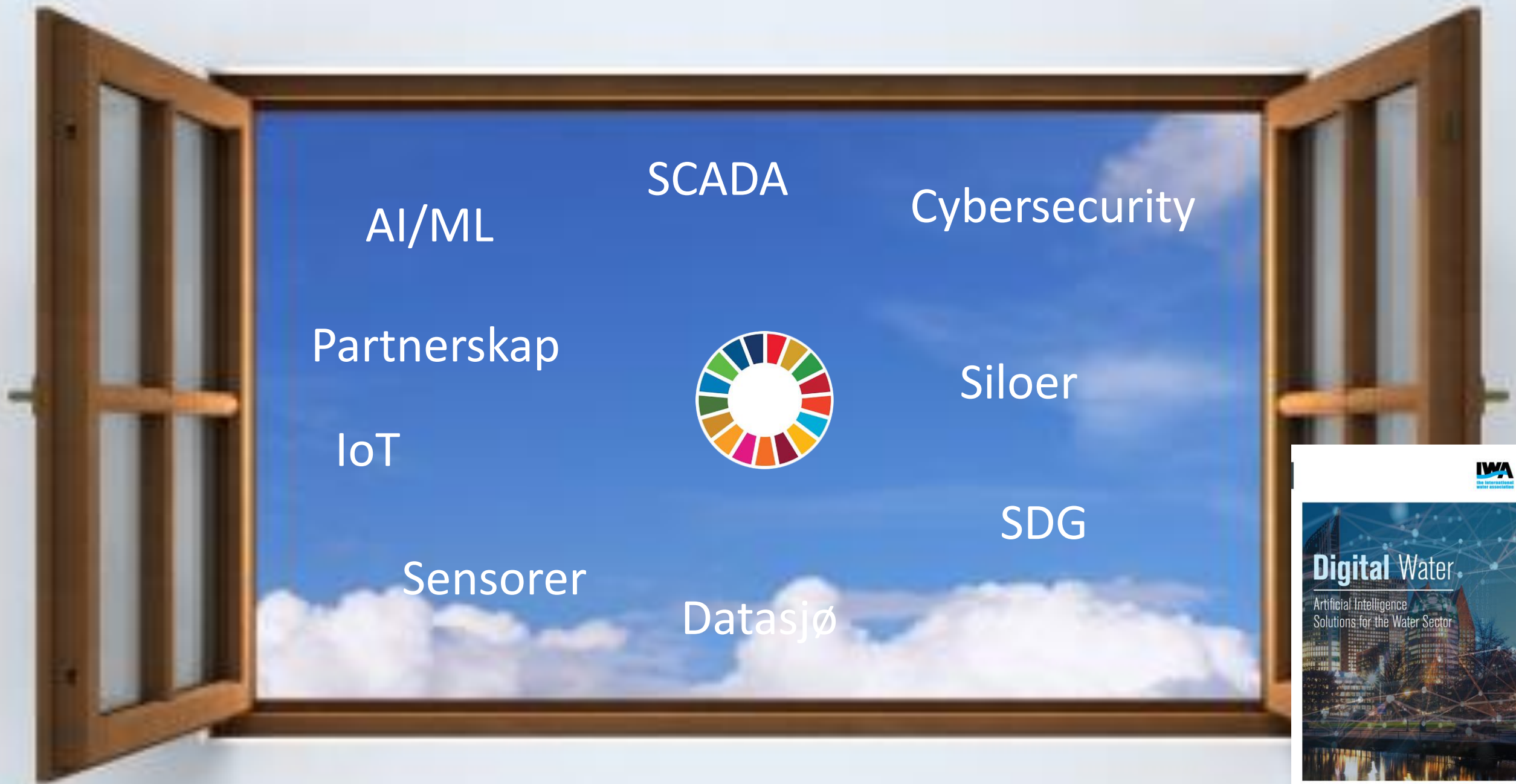
PROSESSERING

INFORMASJON

«Målet er som alltid å levere rent vann til folk og fjord»

Magnar Sekse, VA-sjef Bergen Vann





AI/ML

SCADA

Cybersecurity

Partnerskap



Siloer

IoT

SDG

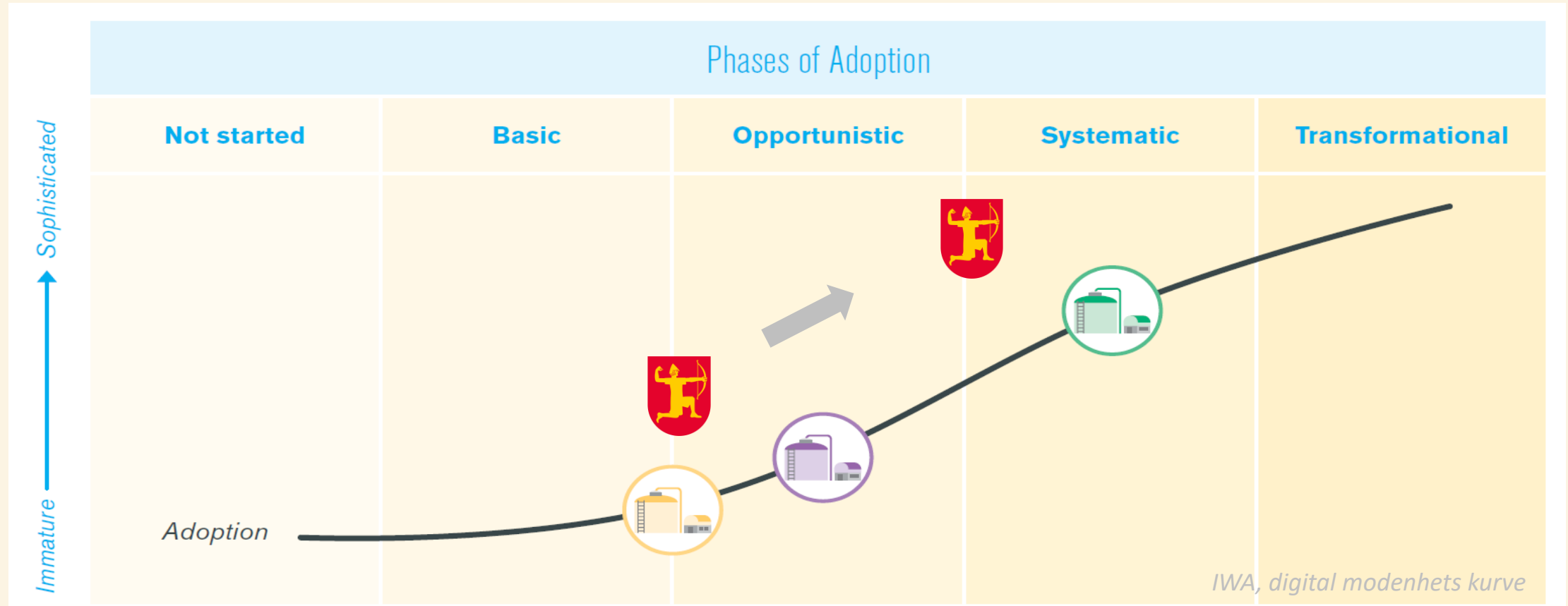
Sensorer

Datasjø

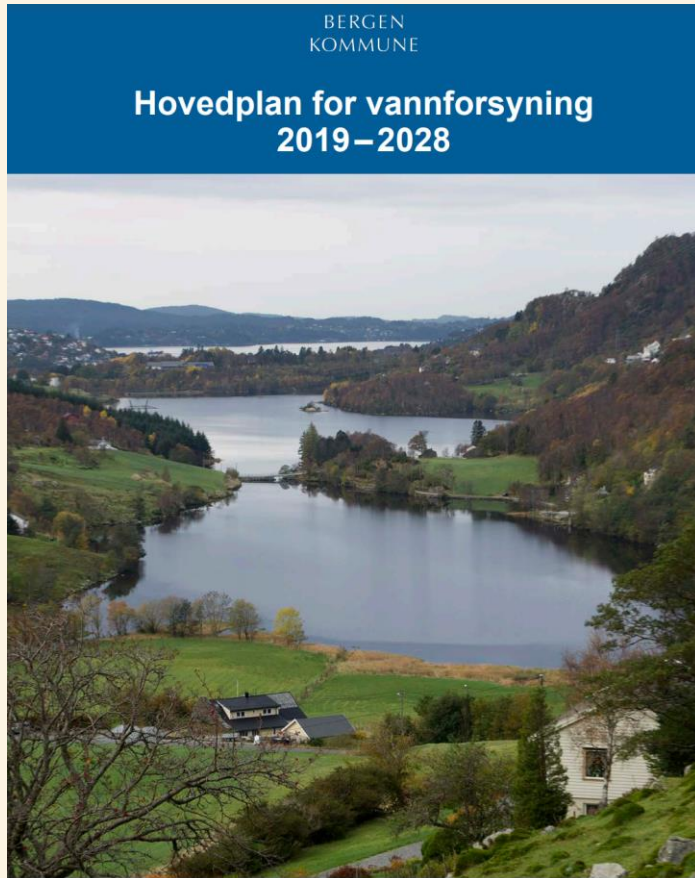


En løsning på disse utfordringene er
Digitalisering

Vannbransjen skal opp og fram!



Har vi en plan for digitalisering?



«Data fra styrings- og overvåkingssystemer skal være tilgjengelig i de verktøy som brukes av utepersonell, innepersonell og ledelse.»



GWI - trender

- Data i siloer forhindrer utnyttelse
- Bærerkaft, klima og kostnader er drivere for digitalisering
- Skyløsninger er viktig
- AI/ML er nyttig, men krever gode data
- Digitalisering trenger gode case med tidlig nytte
- Vannselskap- leverandør partnerskap med fokus på kundens behov
- Organisasjonskultur utgjør både en barriere men også en mulighet for en digital reise

Executive summary



The Digital Futures Symposium brought 20 utilities together with key vendors to discuss opportunities and learning points from their own experiences with digital technologies. The series took place over four sessions from August to November 2020, and covered data accessibility & integration, perfecting procurement, smart cities & IoT, and digital best practice. Although every utility is unique, they share many of the same challenges:

- Legacy systems and data silos prevent most utilities from fully accessing their data. They must then maintain control of their data, and avoid information overload.
- Customer engagement, sustainability, and resilience to climate change are joining cost savings as the key drivers of digitisation among water utilities.
- Pursuing digitisation requires a strong business case, but the difficulty of calculating ROI means that a leap of faith is also needed. Quick wins are essential to maintain buy-in.
- Off-the-shelf solutions are rarely suitable for a utility's needs. Instead, vendors need to understand their clients' pain points in order to focus on their most pressing needs.

Data accessibility



Almost all utilities have vast amounts of data, but struggle to turn this into actionable information.

- Legacy and/or proprietary systems create data silos that stand in the way of successful digitisation. Service-based offerings and migration to the cloud can be part of the solution, but many utilities still prefer the certainty of operating in-house and on-premise.
- Artificial intelligence and machine learning are powerful tools, but are only as good as the data available to them. A solid foundation of data collection and validation is key.

Smart cities



Connectivity provides data that can streamline existing processes - it can also lead to previously unimaginable functions and services.

- Demand for connectivity is increasing. Use cases that focus on sustainability, resilience and customer engagement are increasingly joining financially-driven projects. Implemented correctly, smart city initiatives can achieve all of these goals and more.
- A small number of early adopters are shooting for large-scale visibility of data across their utilities and beyond. From conservation efforts, to billing, to joining up climate adaptation efforts across a city, data unlocks new possibilities for collaboration and innovation.

Procurement



Procuring digital solutions requires a shift from vendor-client relationships to long-term partnerships.

- Vendors need to be familiar with each client's needs and capabilities in order to address relevant pain points. Utilities can find ways to increase contact with would-be suppliers, while remaining compliant with procurement regulations.
- A partnership mindset is especially important once a contract is signed and the implementation of a solution begins. Realistic expectations, proactive troubleshooting, and effective communication are vital to avoid costly project failures.

Best practice

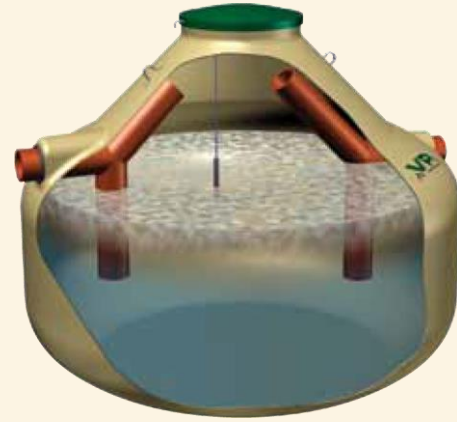


Organisational culture is the greatest barrier on a utility's digital journey - as well as its greatest opportunity.

- Sign-off from management is no guarantee of success. Digital solutions will only succeed if the people who are expected to use them - be it operations or administrative staff, or even customers - are convinced of their value.
- Outdated processes and technologies often result in utility staff having to spend time on tasks that do not match their expertise. Making sure that staff perceive a solution as something that will help them, as opposed to replacing them, is essential.

Eksempler på sensorer innen VA (driftskontrollsystem + IoT)

Smarte
vannmålere



Fett og
oljeutskillere

Overvannsanlegg



Ventiler



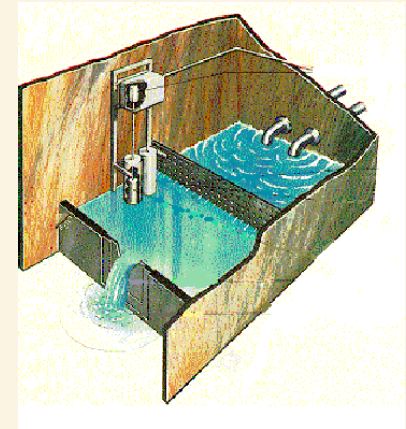
Kummer



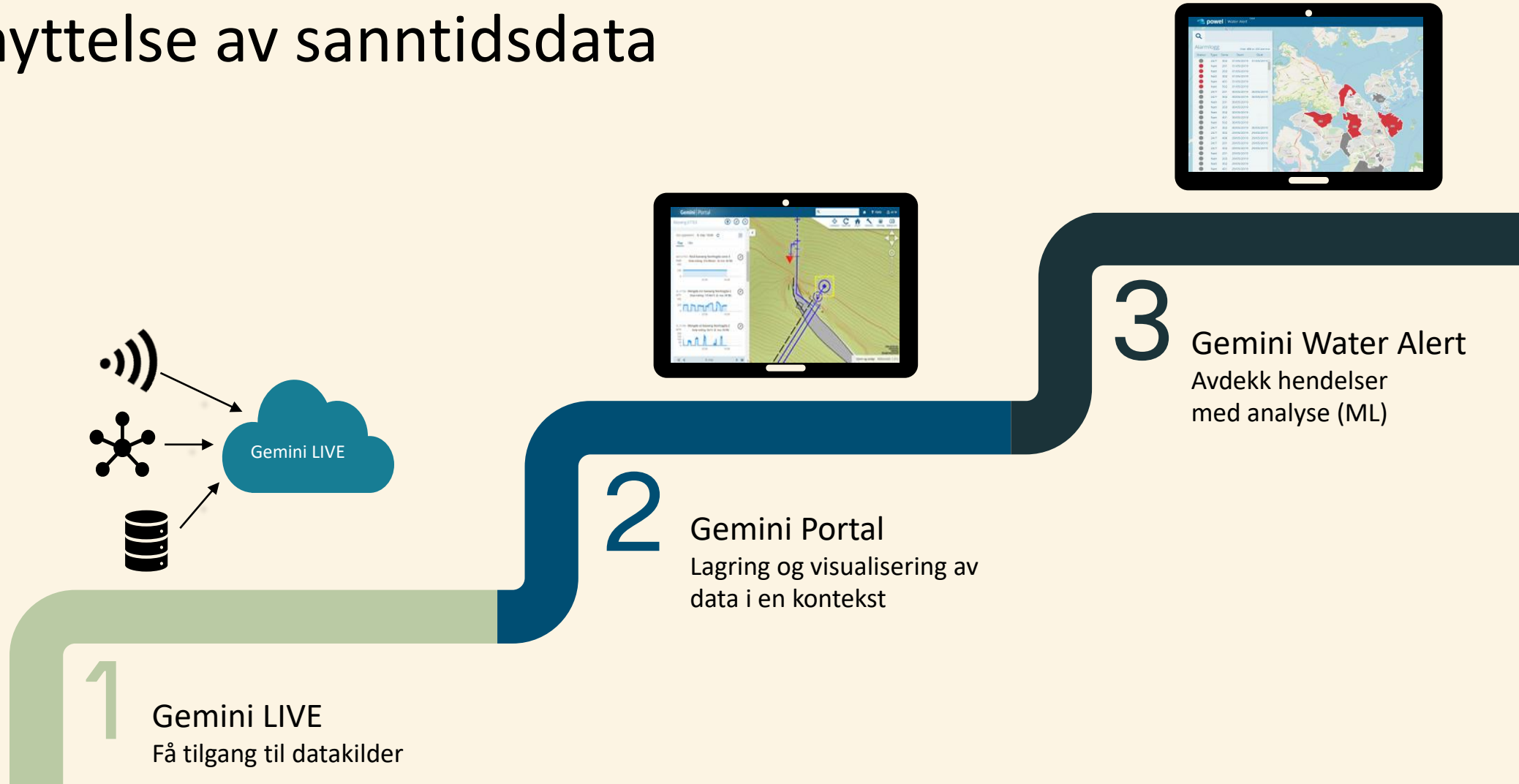
Sandfang



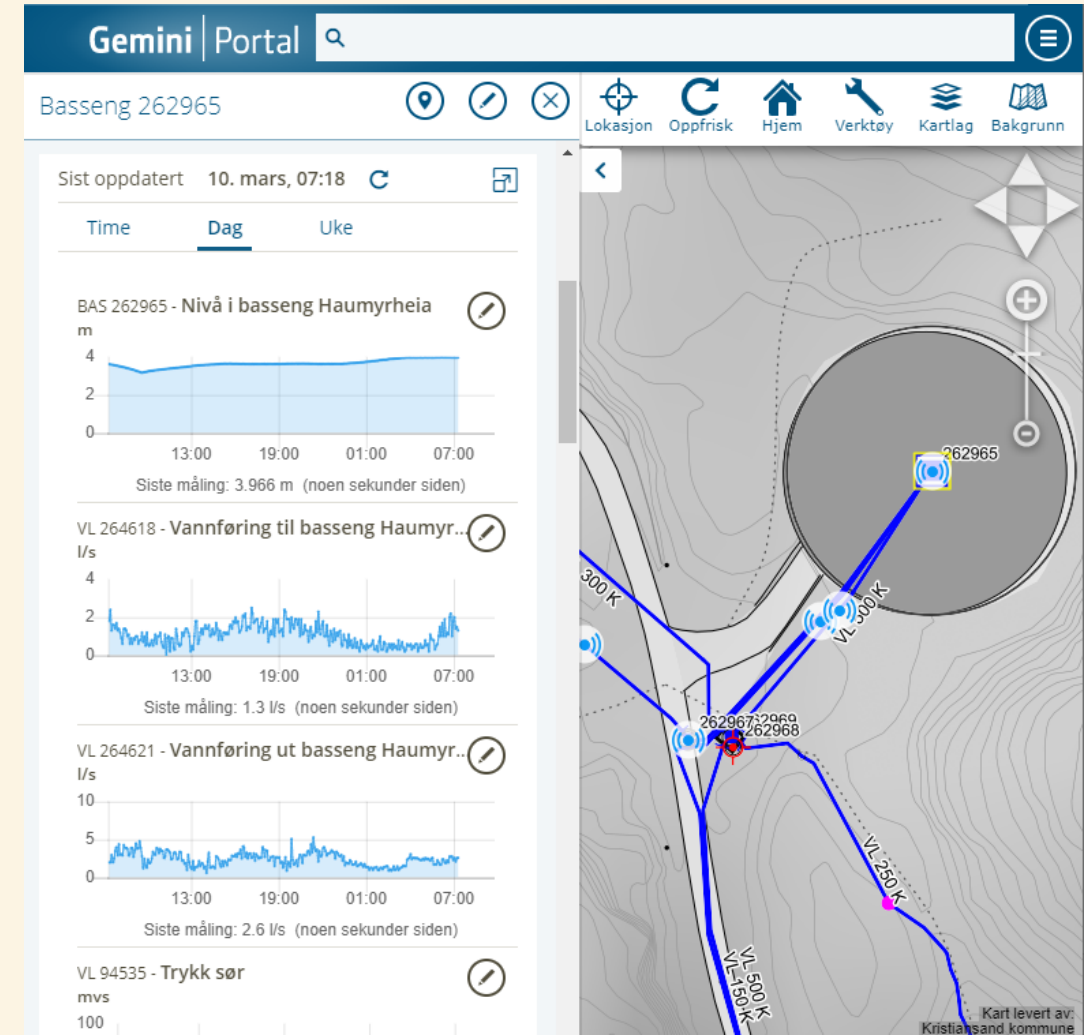
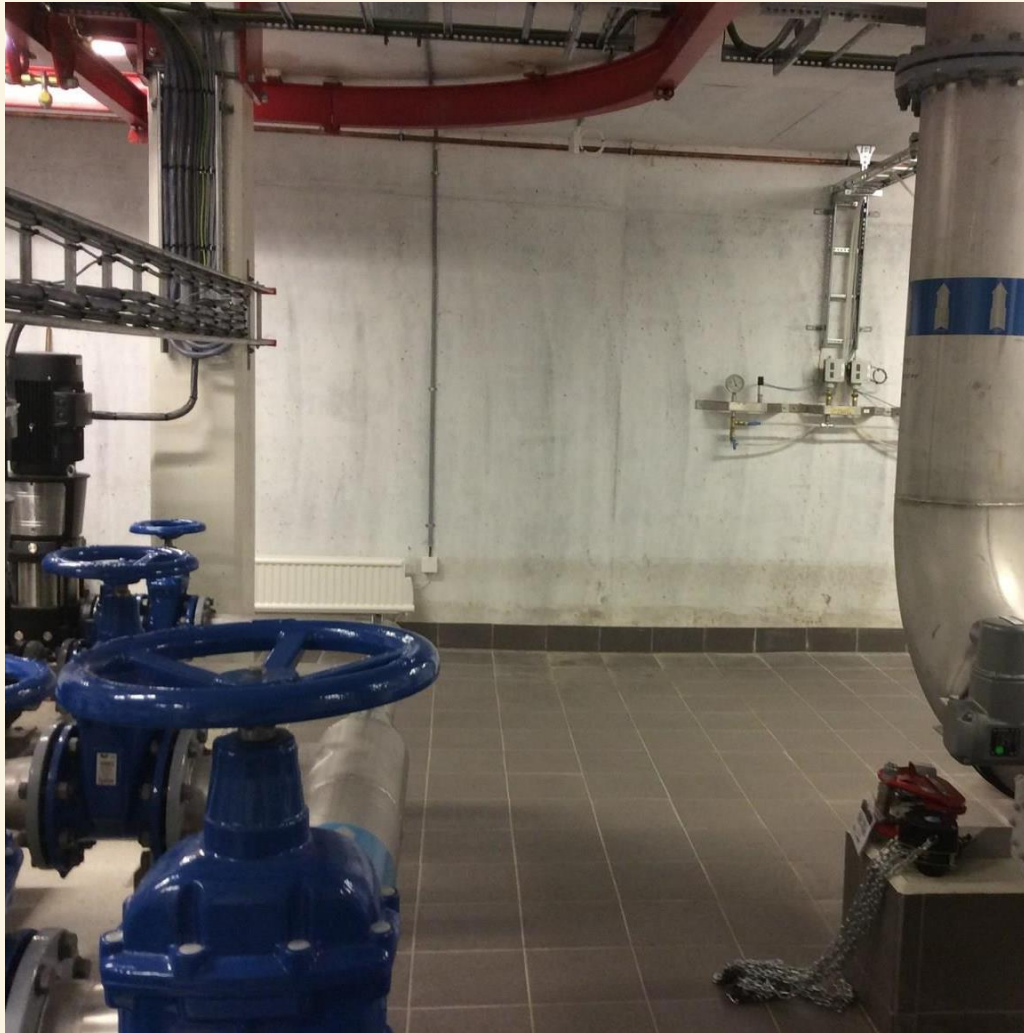
Overløp



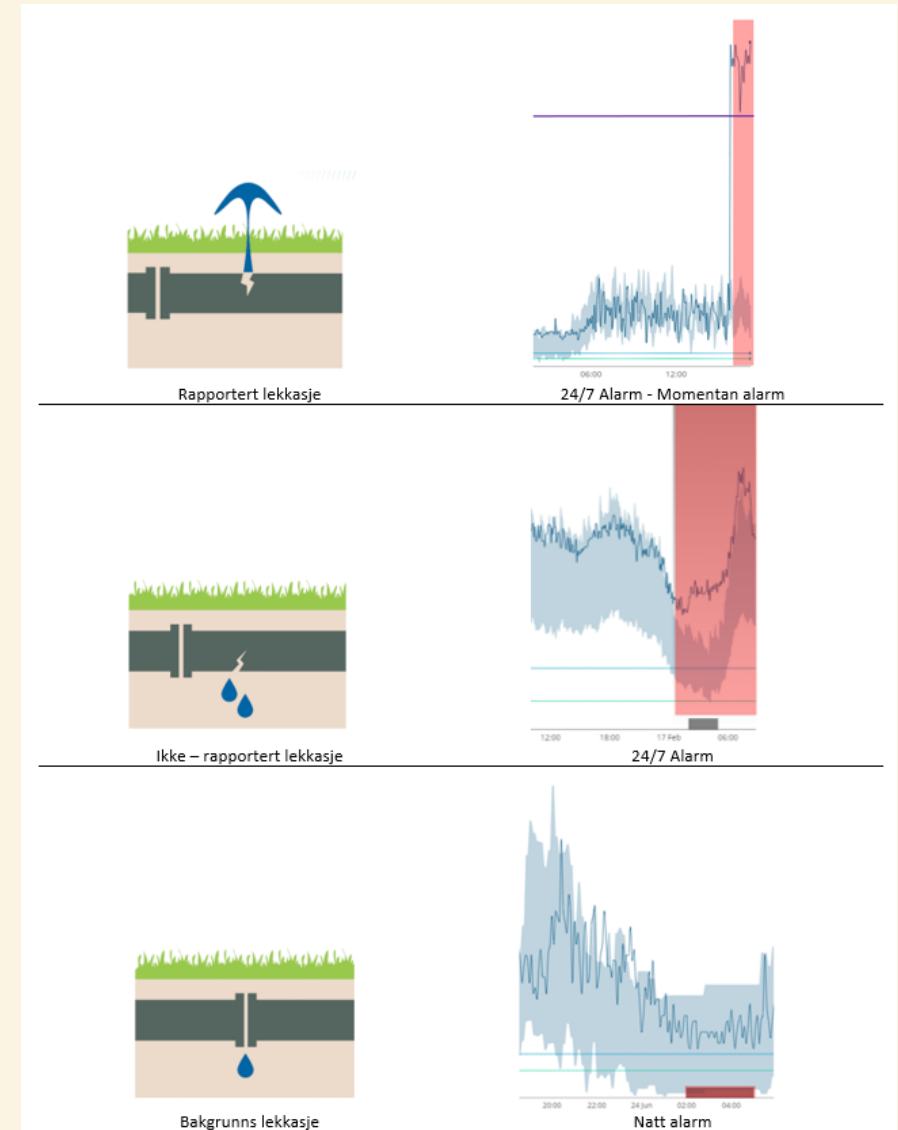
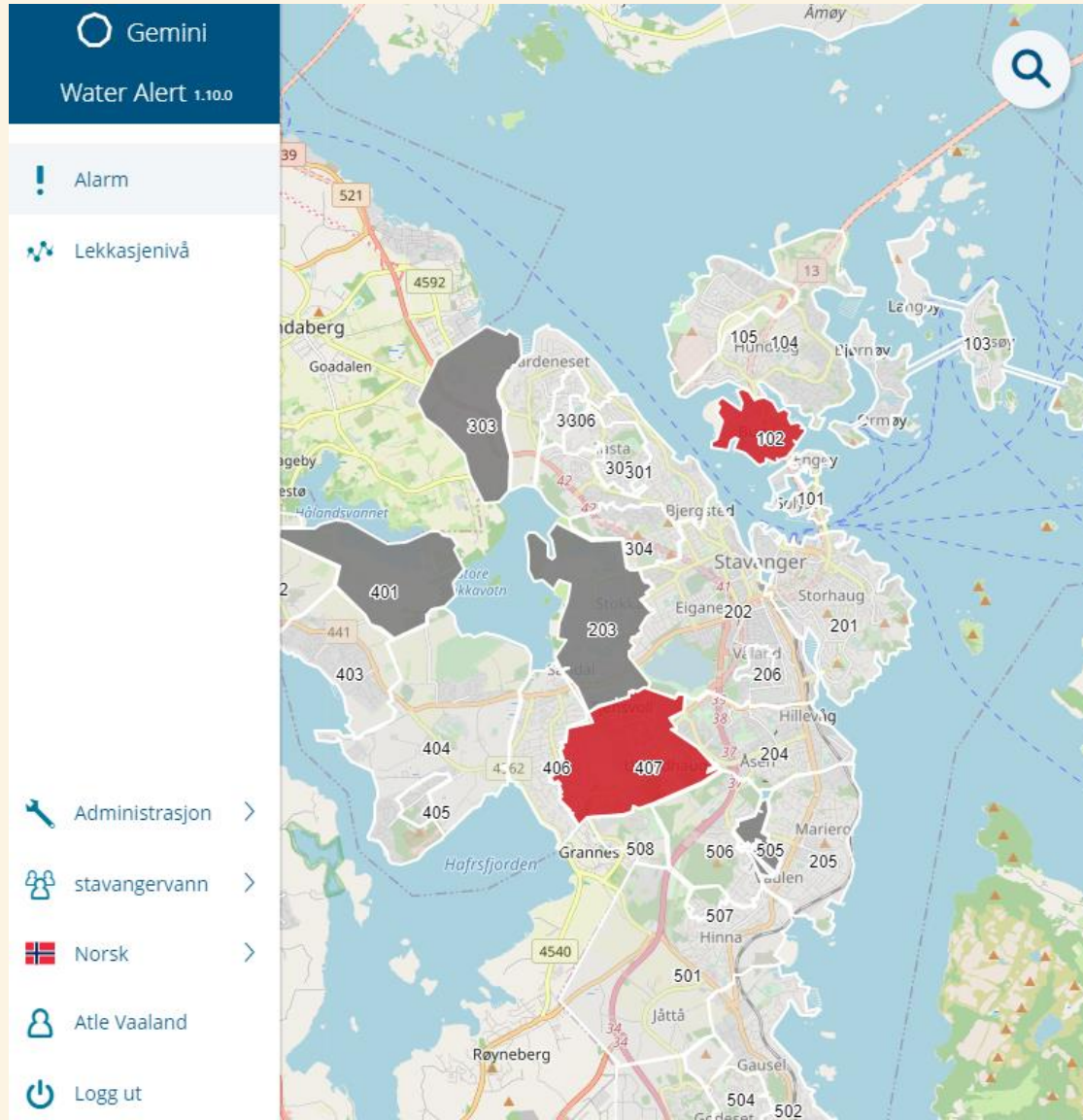
Gemini LIVE – utnyttelse av sanntidsdata



Gemini LIVE - Demo



LIVE - Water Alert



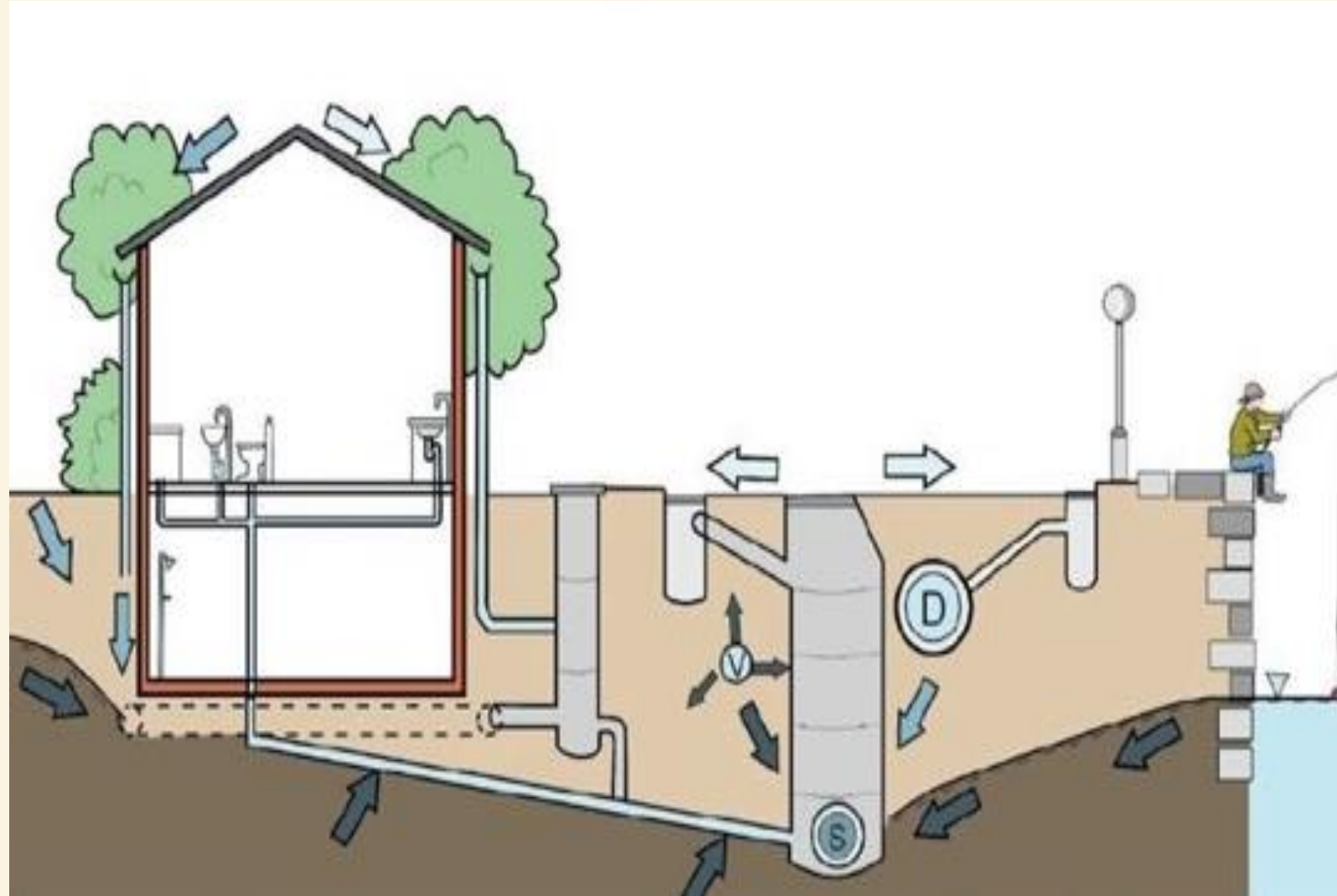
Tilsvarende for fremmedvann i avløpsnettet:

– lytt til sanntidsdata!

- Er det feilkoblet takvann?
- Er det via kummene?
- Er det via ledningene?
- Er det via overløp? (sjø)

Sanntidsdata kan fortelle oss om hvem som er syndebukken

Husk: 1,5% ledningsfornyelse er ikke svaret hvis vannet kommer fra taket!



Masteroppgave NTNU 2021

Sander Roald Søvik

Bakgrunn: Grunnkurs python, EIT maskinlæring og Hydroinformatikk

Fremmedvannsanalyse vha ML

- Data fra fem forskjellige pumpestasjoner i Bergen.
- Mål: Bruke modellen til å oppdage unormal vannføring
- Nevrlt nettverk utviklet for å håndtere tidsserier
- Tar vare på viktig informasjon fra tidligere tidssteg

Model:

- **Input:** Temperatur, tidevannsnivå, nedbør, sumpnivå, time, ukedag og måned fra de 10 siste dagene.
- **Output:** Vannføring i pumpestasjonen

Master's thesis

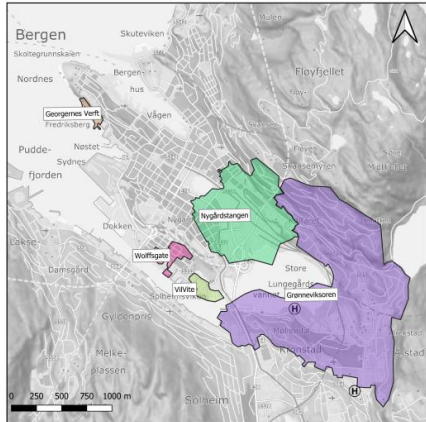
NTNU
Norwegian University of Science and Technology
Faculty of Engineering
Department of Civil and Environmental Engineering

Sander Roald Søvik

Long Short-Term Memory for Detection of Inflow and Infiltration Water in Sewer Systems

A Case Study from Bergen Municipality

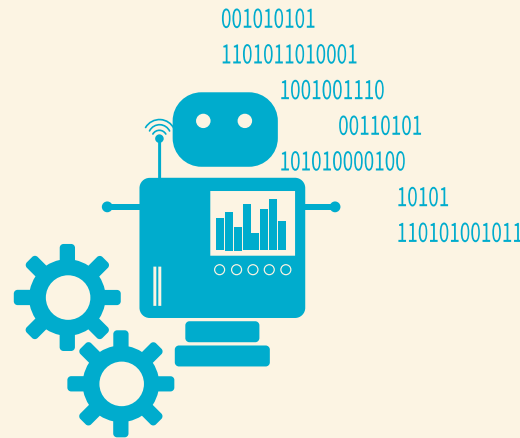
Master's thesis in Civil and Environmental Engineering
Supervisor: Franz Tschekner-Gratl
Co-supervisor: Marius Møller Rokstad
June 2021



NTNU
Kunnskap for en bedre verden



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value