

# Oasen and OrangeNXT: working together on a self-regulating drinking water infrastructure

Drinking water company Oasen, Microsoft and OrangeNXT are working together to realise a smart, data-driven drinking water infrastructure that makes use of the Internet of Things. The fact that OrangeNXT would be realizing the new technology at Oasen was no more than logical. The partners met each other regularly at Microsoft and so when Oasen needed a Digital Twin (digital representation) of the drinking water network, collaboration was only natural.

Business development manager Bas Lamme of OrangeNXT (a subsidiary of ICT Group specialised in cloud solutions), Manager ICT Nino Marino and drinking water company Oasen's IT-project leader Jonathan Vondeling can't wait to perform a series of live tests on the software they've developed. And although the coronavirus has managed to complicate things, in a recent online lockdown meeting, rather than describing the experiences gained during the series of tests, they

chose to share their enthusiastic comments about the expected benefits of the system.

## Reduced leakage losses

The partners expect that this Digital Twin will allow them to manage the supply network more proactively, effectively and efficiently in order to improve the availability and quality of drinking water. The quality of the Dutch drinking water infrastructure is high compared to other European





countries. Generally our leakage losses are no more than a mere 4% to 5% depending on the region. In France for instance, this is 20% and in England even 23%. "Drinking water company Oasen supplies a total of approx. 45 million cubic metres of drinking water a year. Our aim is to reduce the leakage losses to 1% by using the Digital Twin. That would add up to some 450 million litres of drinking water," says Nino Marino.

### Prescriptive maintenance

He adds: "the main benefit is that we can prevent calamities. We call this prescriptive maintenance. And this means that we cannot only predict the need for maintenance, but that simulations will also allow us to discover possible causes of problems and ways to solve them. And because this technology will also enable us to detect even the smallest of leakages, we will be able to improve our network proactively and invest more effectively. We can detect minuscule leakages by closing down small parts of the network at night-time because very little water is used during this time. Sensors and algorithms allow us to detect leakages in the closed sections of the network. This technology lets us predict the locations where breaks in the network may occur and carry out the appropriate measures ahead of time in order to prevent problems."



### Automatically handling calamities

The Digital Twin will also allow Oasen to intervene automatically should any calamity occur. In the event of a leakage the system can shut down valves in the network. Marino: "In the current situation, engineers need to travel to the location of the leakage and even then, it takes them a while before they can shut down the water. Closing the valves automatically and more promptly means that we can achieve substantial benefits and prevent damage from water hammer. The Digital Twin will also allow us to avoid water problems in the streets. Because we automatically close down leakages and preventively replace piping, the quality of the drinking water remains consistent. Now we often have the water tested for bacteria after a breach in the network because we cannot be sure whether the water from the repaired network is immediately reliable and drinkable. This is also a cause of inconvenience for our customers, because they have to boil the water before consumption."





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### Collecting relevant data

During the last couple of months a great deal of work has been performed in order to realise the pilot. To start with, we made a digital representation of the District Metered Area (DMA) which comprises multiple valves. Oasen's Jonathan Vondeling explains that the drinking water company already had a lot of the relevant information that was used for the Digital Twin, but that it was stored in different systems. "We brought this information together, but it is of crucial importance that you cross reference the right data. Only when all data in the digital representation is reliable and valid, does the Digital Twin add additional value."

### Sustainable system

The partners gained a lot of valuable insights during the implementation. OrangeNXT's Bas Lamme explains that it is extremely important to design the Digital Twin step by step and that it is based on a scalable architecture. "We were continuously focused on simplicity and effectiveness during the project. We connected sources and added intelligence in stages under the watchful eye of the actual users. In addition, we paid a lot of attention to cyber security. Building a future-proof system is an interesting challenge."

## Towards a self-regulating supply network with a Digital Twin.

### Safeguarding knowledge

OrangeNXT's business development manager adds that a Digital Twin not only makes things easier, it also safeguards knowledge within the organisation. "Setting up this Digital Twin allows us to translate knowledge and experience of individuals into algorithms. We notice for example, that the aspect of ageing is another reason for companies to digitalise."

Do you want to know more about the project or the results? Please contact Bas Lamme, Business Development Manager:

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