

BIG DATA AND INTERNET OF THINGS (IOT) ARE THE SOURCE OF **SMART MAINTENANCE.**

INTRODUCTION

OXplus in Veghel is proud to present its contribution to a major international metro route. Managing consultant Richard Noppert talks passionately about the ins and outs of this complex and unique project. Big Data and Internet of Things (IoT) are the source of smart maintenance.

Management consultancy OXplus earned its spurs in the field of Enterprise Asset Management (EAM) in the transport sector and particularly in the rail sector. "An existing client approached us to ask whether we would, in the first instance, like to share ideas on a database solution for recording master data in conjunction with the construction of international metro lines. OXplus knows the world of transport and the processes of metro systems. We have the necessary software and hardware related knowledge and skills to build a system in the right way and this enables operators and maintainers to do their work well. But this time, therefore, on the design and build (D&B) side instead of operate and maintain (O&M) and that's something unique for us", Richard explains enthusiastically.

MASTER DATA

OXplus was commissioned for the D&B process of the IT systems required to record and validate all master data from the complete metro system. "You can imagine that a metro route is a complex system of rolling stock, safety systems, power supply, signalling, communication, computer networks and passenger information systems. OXplus supplies the Technical Database (TDB), the software and the structure of the system and supports the customer in logging all the master data from the metro system. The aim is to enable the future operator and maintainer to carry out maintenance of the metro system as best they possibly can. If, for some other reason, a system fails, the issue must be directly measurable, traceable and detectable", explains Richard.

IOT AND KPI

A logical consequence was the request for a database solution in which sensor data from the entire metro network can be stored. IoT plays a major role in this. "This SQL database enables us to make trend analyses and improve systems on the basis of historical data." The RAM (Reliability, Availability and Maintainability) performance management system then identifies all performance elements and provides an insight into key performance indicators (KPIs).

BIG DATA

All three systems, namely TDB, SQL and RAM, are related to each other and offer a complete solution for the metro system. "We deliberately opted for a solution based on Oracle hardware and software, with Oracle Data Integrator, Oracle Business Intelligence and Oracle Database software providing the basis. This software is attuned to each other and that means we can achieve an optimal result", explains Richard, the IT system architect. "Our greatest challenge was the complexity.

So many parties are involved in the construction of the metro route that it is a real challenge to register all the data in the same format and to the same quality. A uniform way of storing big data also had to be found for the SQL system. The collecting, linking and transforming of sensor data from various sources required an ELT (Extract, Load and Transform) tool. In the case of the RAM system, which establishes the relationship between performance and errors, the algorithms used to calculate the KPIs were extremely complex. So every route has its own challenge and that, of course, makes it hugely interesting", Richard explains with a laugh.

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MAINTAINER.'**

PRE-TRIAL RUN

The project was started in 2013 with initial sketches and now the development environment in Veghel is finished. The production solution is soon going to be relocated abroad where the implementation and the configuration of the system is actually going to be tested. The aim is to organise a trial run with one of the metro lines in the last three months of 2018.

As far as we are concerned this pre-trial run is the ultimate test of whether we fulfil all the contractual obligations”, Richard confidently explains. The metro lines have to be operational in 2020. OXplus is going to be involved in this project certainly until 2022.

**‘OUR GREATEST CHALLENGE
WAS THE COMPLEXITY.’**

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