Digitalization at Uniper

Dr.-Ing. Stephan van Aaken
Vice President
Asset IT Architecture and Optimization
Digitalization at Uniper

Date: 25th April 2018
Dr.-Ing. Stephan van Aaken
VP Asset IT – Architecture and Optimization
Agenda

• Introduction to Uniper
• How Uniper successfully developed a digital transformation roadmap
• How Uniper approaches the implementation
• Technical elements for a successful digital transformation at Uniper
• What was essential for the success from a Uniper perspective?
• Early benefits
• Enerlytics: Equivalent Operating Hours
We are Uniper

- Uniper is an international energy company with approximately 12,000 employees and operations in more than 40 countries.

- Our portfolio comprises industrial-scale plants, trading activities and service provision. We provide a reliable supply of energy.

- Since September 2016, Uniper has been listed on the stock exchange and represented in the MDAX and MSCI-Germany.
Uniper at a glance

Our operations
Power Generation
Commodity Trading
Energy Storage
Energy Sales
Energy Services

We operate in 40+ countries around the world

Main activities

- Gas fired power plants
- Coal fired power plants
- Gas storage
- Regasification
- Trading
- Nuclear plants
- Energy sales to small and large customers
- Gas infrastructure
- Service
- Hydroelectric plants

€1.7bn
EBITDA in 2017

100 years
Experience

~36 GW
Generation capacity

Our operations in 40+ countries around the world
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In May 2017 we conducted an Envision Summit and agreed 9 strategic programs...

D@G Optimize F2E is a joined “Asset Management / Asset Operations” program...
Uniper’s definition of Asset Management

**Asset Risk**
- Securing compliance and applying consistent risk based operations & maintenance approach cross technologies

**Asset Management Core Responsibilities**
- Outage, project management and technical support for Asset Operations, leveraging knowledge across the technologies

**Asset Strategy & Development**
- Managing development options & deriving and executing strategies for existing assets
- Developing innovative business models with scale-up potential

**Asset Support & Outage Excellence**

**Innovation**

Within Year to Mid Term

Mid Term to Long Term

we maximise Uniper’s asset portfolio and the asset life cycle value
Front-to-end digitalization of Asset Management processes

A truly data-driven, front-to-end digital management of our Generation portfolio
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Uniper’s journey to its digital transformation

...so we knew we wanted to approach this topic, but we had questions

We are already going through a major change, how do we approach the transformation in such challenging times?

The market is continuously changing, what do we include in the transformation and what do we leave out?

We are very cost sensitive, how much will it cost and when do we see tangible benefits?

...and how do we actually do this???
Uniper’s journey to its digital transformation

3-4 Month
Digital Discovery (pre-project)

Deliverables included

• Business case (out-side-in) based on cross-industry experience
• Portfolio of initiatives with scope, cost, benefit, effort and pre-requisites
• Roadmap proposal

1 Month
Hand-over to line functions

Initiate D@G Program

The Uniper ‘translation’ of the roadmap

3+ year
Data Governance

System / Data Transparency

O&M Process Harmonization

Data Historian

Smart Sensors

Mobile Solution

KPI / Reporting

enerlytics (e.g. eoh)

Goal: Become a data-driven company
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Abstract representation of the Uniper Architecture

### Backend Systems
- **Data Infrastructure:** OSIsoft PI System*
- **Data Warehouse:** Bespoke Development
  - SQL Server and Snowflake

### User Systems
#### Reporting Governance
- **Self-BI Solution for multiple sources (Tableau)**
  - Typical user groups:
    - Central asset management / operations
    - Plant engineers
    - Trading functions

#### Analytic Governance
- **Data Lake (Open source based)**
  - Typical user groups:
    - Asset data scientists
    - Trading data scientists
    - Uniper Engineering Group

#### Reporting Governance
- **Self-BI Solution real-time data (PI Vision)**
  - Typical user groups:
    - Plant engineers
    - Central asset management / operations

### Technical Details
- **Harmonized Economic Generation**
- **Harmonized Production Volumes**
- **Harmonized other data**
  - Economic Generation: F & DE, UK, SW E
  - Production Vol.: F & DE, UK, SW E
  - Other data e.g. prices, unavailability, technical, etc.

*The data historian is only used for technical sensor data.*
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What was essential for the success from a Uniper perspective?

- **Senior Management is fully committed**
  Sponsored by the EVP Asset Operations, EVP Asset Management and the CIO.

- **Uncertainty is accepted**
  Pre-conditions at sites differ and it hasn’t been done before, be agile.

- **A Business Program**
  The projects are lead by managers with business line function responsibility.

- **People Change is the challenge**
  To achieve a sustainable digital transformation we need to coach our people through the change.
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Significant benefits have been captured
Benefits have been captured within the first year of the program which is crucial for a successful people-change process

Digitalization

- **Resources freed up**
  A significant amount of manual data collection/processing has been automated and therefore approx. ½ FTE have been “freed” at the first pilot site.

- **Paper-based process digitized**
  The "geographically scattered" hydro business now uses mobile devices for their daily maintenance operations which is directly linked into our SAP PM.

Digital Transformation

- **CAPEX spend reduced**
  With the introduction of the automated eoh based CAPEX planning, a sustainable approx. four m€ saving has been achieved.

- **Fully integrated F2E process**
  The fully integrated f2e process will enable Uniper to align its maintenance and the commodity trading activities in an optimal way in order to benefit best from the volatile global energy market.
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Why adopt the Equivalent Operating Hours (eoh) concept?

The market situation has changed dramatically in the last years. The goal is to collect all maintenance strategy for the main equipment and implement an automated tool which deliver the latest maintenance planning with live site data (OSIsoft PI System) and the latest forecast from the trading division (operating hours & starts). This will allow Flexible Maintenance and Unique and clear Maintenance Strategy view per Plant.

Do you want to find out more about eoh and Enerlytics? Visit www.uniper.energy/enerlytics
Uniper’s enerlytics – OSIsoft PI based Module eoh

**eoh main screen**

- **Overview of Plant Item’s life**
- **Commercial Outage Simulation / Optimization**
- **Fleet Outage Overview**
- **Adding new Units/Plant Items**

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Digitalization at Uniper

Uniper is a global energy company that generates, trades, and markets power on a large scale. We also procure, store, transport, and supply commodities such as natural gas, LNG, and coal as well as energy-related products.

What is special about our capabilities is that we can provide both technical and commercial expertise at the same time.

We are looking for innovative solutions and believe in the advantages offered by digitalization.

**CHALLENGE**

Become truly data-driven with a front-to-end digital management of our Generation portfolio and thereby increase profitability

Each plant site is unique, therefore

- plant systems installed,
- protocols in use and
- scope, granularity, availability and quality of data differs from site to site

**SOLUTION**

Made heterogenous operational plant data available as “clean” information for planning, doing and studying

- Asset Framework
- Event Frames, Notifications
- PI Vision
- PI Data Link

**RESULTS**

Significantly reduced CAPEX spend via Uniper’s enerlytics based and publicly available Asset Management Planning tool and reduced waste

- Reduced CAPEX by >4mio€
- Removed waste and thereby freed-up engineer’s time approx. 1000h/year per site
Digitalization at Uniper

• Dr.-Ing. Stephan van Aaken
  • stephan.van.aaken@uniper.energy
  • Vice President Asset IT Architecture and Optimization
  • Uniper SE
Questions

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