

## Study Committee D2

Information Systems and Telecommunication

Paper 10623\_2022

# DATA MANAGEMENT AND ANALYTICS PLATFORM FOR CONVERGED OPERATIONAL DATA

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## MOTIVATION AND CHALLENGES

- A vast amount of data is generated by various systems: advanced metering, SCADA/ADMS, billing, asset management, field operations, GIS, CIM topology, weather etc.
- Distribution companies already collect and store data. However, this data is stored in dedicated silos used in individual departments.
- In order to obtain true added value from the data, the process of refining the existing data, adding more insights by combining data from different sources and proper data analysis is needed.

### WHAT IS OUR AIM?

Implementation of a platform that addresses the challenges of efficient use of various data, building upon a solid technical foundation and providing access to quality and trusted data.

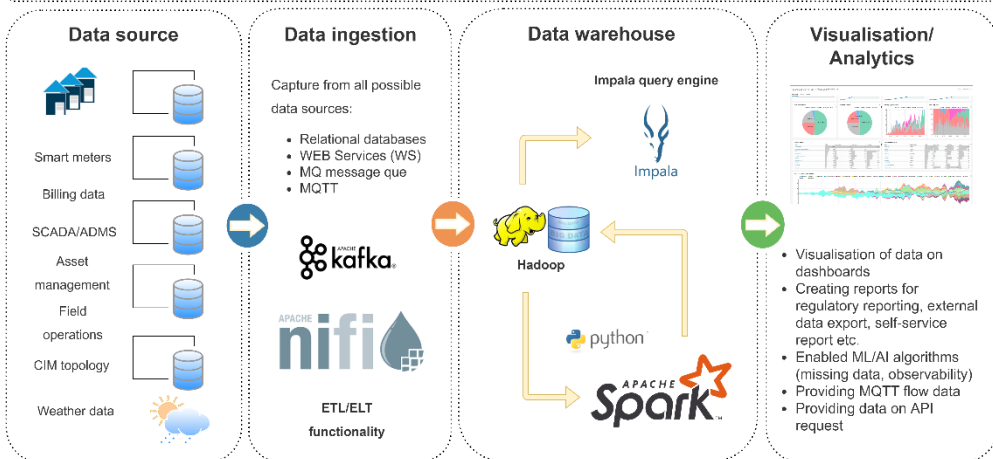
## BIG DATA MANAGEMENT PLATFORM

- A central data platform for data management and analytics, where data from all possible sources are ingested and processed to be available for business analytics, visualisations and data science operations.
- It uses state-of-the-art big data technologies.
- The BDMP provides security, robustness, and high mass data processing capability. It is scalable in terms of data volume and extensible, allowing easy extension to additional data sources in the future.
- It supports data services and on-demand access to data by external stakeholders (REST API).
- The BDMP creates relations between the underlying technical data with other non-energy data based on a well-defined dimensional model.

Data security



Data governance and metadata management



## USE CASES

### EVENTS AT MEASUREMENT SITES

The recording and management of events at measuring points improves the productivity of field works and controls the correctness of the execution of the works.

### EVENTS AT MEASURING DEVICES

Review of detected events on measuring devices in correlation with events on measurement sites improves network management.

### GRID LOSSES

- Differences between all energy imported/produced on observed distribution area and energy readings on metering points at end-users.
- Analysis of losses on micro-level (transformer area).
- Identifying anomalies on the network by combining network topology and measurements.

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### continued

#### TRANSFORMER OVERLOAD OBSERVABILITY

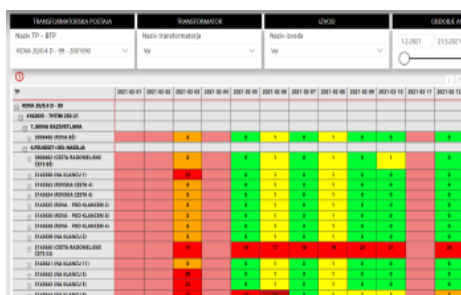
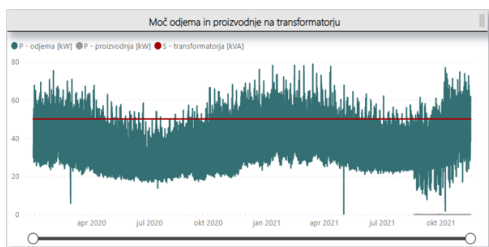
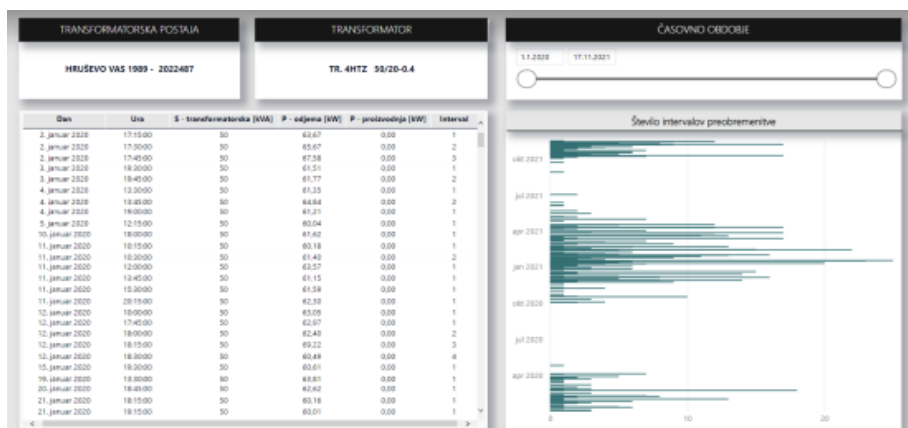
- Analysis of transformer overloads, time periods of overload, defining asset health indices, identification of transformer substations with flexibility potential etc.
- Advanced analytics of various data, as opposed to only having metering data, reveals deeper insight into network performance, enabling implementation of existing and new ideas which will improve network planning/asset management and operation.

#### EVENTS ON ELECTRICITY INFRASTRUCTURE

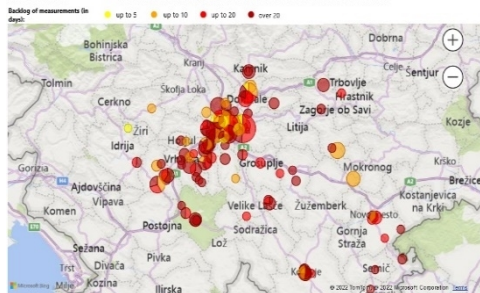
The goal is to analyse how investment and maintenance events are handled and enable an approach for predictive maintenance.

#### PLC/SMART METERING COMMUNICATION

Daily supervision of communication conditions, data collection and indication of the number of days when data is not collected.



#### 25.07.2022 PLC communication across transformer substations



## CONCLUSION

- The initial objective was successfully achieved, both from implementation perspective, as well as technical solutions for data processing.
- The developed solutions within BDMP enabled versatile analytics and support to individual experts to make agile and data-driven decisions in the areas of maintenance, management, and optimisation and development of the electricity network.