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FURNACE MODELLING - SHARING THE EXPERIENCE FOR DATA ANALYTICS AND MODELLING IN THE STEEL PRODUCTION DOMAIN

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Digitalization, driven by key enabling technologies like sensors, big data, artificial intelligence, internet of things, automation, and digital twins, is a key factor in advancing manufacturing. The VMAP-analytics project aims to create a smart digital twin platform, integrating sensors, measurement data, process modeling, and data science tools. With three specific use cases in Sweden, and one in Germany, the project focuses on developing new expertise and business models for optimized production.

Three use cases of Sweden in this project involve a deeper understanding of manufacturing processes that include reheating furnaces, degassing of steel making and hot rolling for flat products. This presentation focuses on reheating furnace use case to support in development of a better Furnace Optimization and Control System (FOCS). Towards this end, physics-based and data-based models are developed.

The presentation discusses various aspects of modeling, the preparation of data and the application of XGBoost algorithm for analytics. The following suggestions are made from this project:

- Availability of sensor data for boundary conditions for the physics-based models.
- Availability of data for validation of physics-based models
- Ontology and semantics for sensor data
- Handling industrial data

The importance of VMAP standards and their applicability is emphasized.