Process & Sensors Mapping Project

📌 Description

This project focused on developing a **mapping and visualization tool** that enabled the identification and organization of **production processes** and their **physical sensors (PLC tags)** into a clear hierarchical structure.

The tool was **key and necessary to bridge the technical complexity of the plant with the needs of the global digitalization project**, ensuring that detailed local process and sensor information could be standardized and successfully integrated into the corporate software **Aveva PI**, globally used for signal acquisition, capture, and monitoring.

The work allowed both local and global teams to gain a **unified** and **structured** view of processes and their associated signals, facilitating digitalization and integration as part of a **global information unification initiative**.

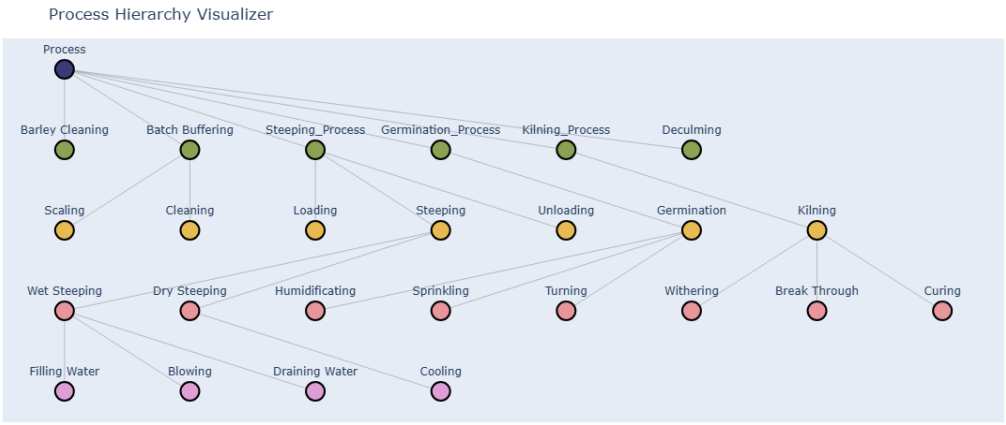
💡 Business Value

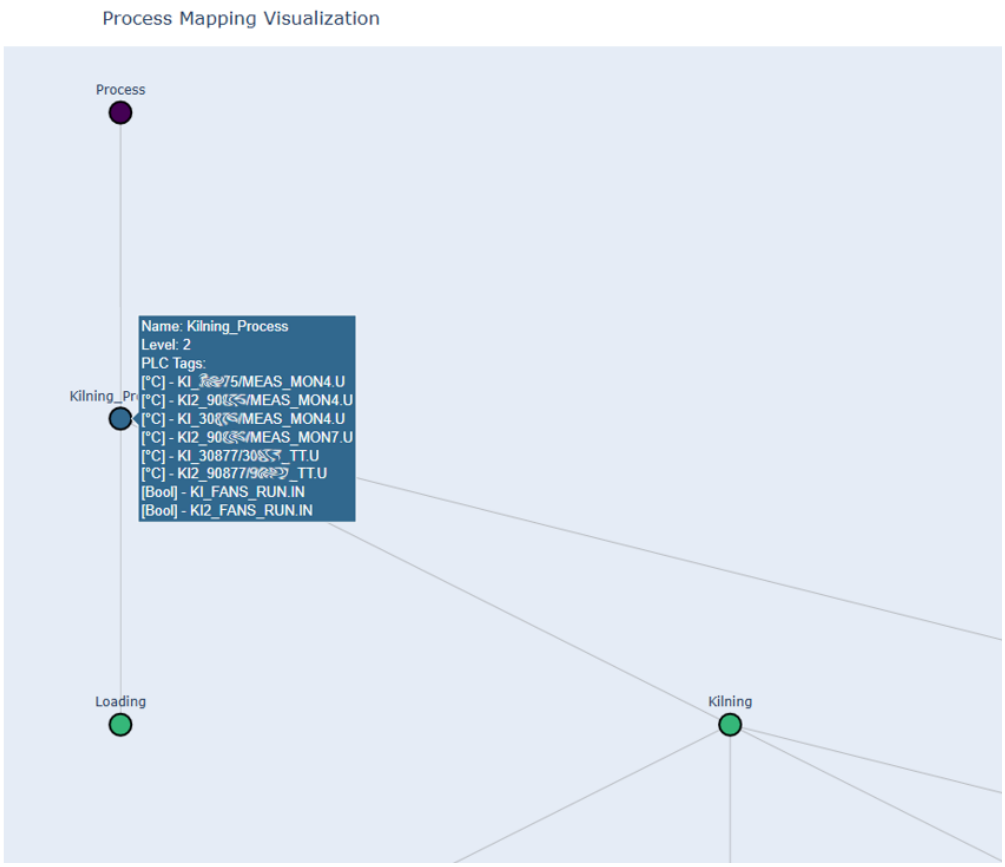
- **Standardization**: clear and hierarchical organization of processes and PLC tags.
- **Digitalization**: preparing information for integration into **Aveva PI**.
- **Visibility**: improved understanding of the relationship between processes and sensors.
- **Collaboration**: common ground between local and global teams for automation and Industry 4.0 projects.

📈 Key Results – Main Findings

- Development of an **interactive hierarchical graph** representing processes and parent-child relationships.
- Integration of **PLC tags and statuses** associated with each process.
- **Hover functionality** to display technical details (name, level, PLC tag, status).
- Identification of processes **"To Be Implemented (TBI)"**, highlighted with distinct visual styling.
- Exported visual representations for effective communication with stakeholders.

Example Visuals





🌟 **Key Benefits (Achieved / Potential)**

- **Reduced complexity** in managing processes and sensors.
- **Solid foundation** for signal capture and analysis in Aveva PI.
- **Scalability** for future digitalization initiatives.
- **Global alignment** in corporate data unification projects.

🤝 **Stakeholders Impacted** Operations, Process Engineering, Automation, Global IT.

🧰 **Technologies Used** `Python`, `Pandas`, `NetworkX`, `Plotly`, `Excel`.

📊 **Analytical Approach** Data ingestion and processing from Excel, construction of a hierarchical graph with processes and sensors, interactive visualization with tags and statuses, export of visual reports for validation and discussion.

🔗 **Access**

- GitHub Repository (internal use)

CONNECT **LINKEDIN**

Note: All process and signal data have been hidden and represented in an illustrative manner to protect confidential plant information.