Automated analysis and visualisation of process data for drawing lines

SMS group delivers high-performance production lines for bright bar. This thesis will predominantly focus on drawing lines. Currently, the measuring signals from sensors integrated in the equipment as well as setting parameters available in the PLC program are recorded continuously for all kinds of analyses.

Within the framework of continuous further development, dedicated tools are required for collecting, analyzing, and visualizing of process data automatically. This requires selecting an appropriate database to which the acquired process data can be sent. Furthermore, the tools to send the data to the database and then to the software that helps to create customized dashboards and alarm signals will need to be investigated.

This master's thesis will build on the work conducted in a prior internship project. Complementary to the internship project, this master's thesis project focuses on a different way of processing of the process data, utilizing different software to acquire, analyze and visualize process data. Furthermore, the work will zoom in to automated handling of the process data and not only a section of the bright bar drawing line, but the complete line will be considered.

Tasks:

1. Develop the overall data communication path via open-source software to transfer acquired process data to a cloud environment.
2. Design customized technology dashboards for bright bar drawing lines that should support operators, production and maintenance engineers to ease the analysis and interpretation of technological parameters. This should result in a better insight into the production process and equipment.

3. Develop an online alarm system for bright bar drawing lines enabling either an automatic notification or even a self-acting intervention in the machine controls based on irregular or inconsistent process data as indications for processing problems to operators and production engineers.
4. Design customized productivity dashboards for bright bar drawing lines, which should assist the production engineer in identifying measures enabling an increase of productivity.
5. Develop different types of analyses for complete drawing lines, considering all equipment within the line.
6. Identify recommendations for future tools enabling the expansion of the usage to peeling, grinding and conditioning lines for bright bar.