Industry 4.0: Optimization for Striker Machine

Overview
Kern Liebers does not have a method to monitor the performance of a stamping machine from their offices. This negatively impacts the timeliness to address issues. Employees from Kern-Liebers want to visualize importance productivity measures, such as downtime, from a remote location.

Objectives
- Develop a system that will optimize the information flow between the stamping machine and management.
- Design a graphical user interface (GUI) to visualize the data gathered.

Approach
- Customer needs, such as ease of use and design elegance, were gathered and ranked using an AHP scoring matrix.
- A needs-metrics matrix was created to establish target specifications.
- Each team member designed an initial GUI and the team selected the optimal one using a Pugh Scoring Matrix.
- A synthetic database was created using Microsoft Excel VBA to mimic a real time system with data refreshing every second.
- GUI was designed in a programming language called Python.
- Data was called into the GUI updating key performance measures and providing management with alerts when machine is running outside of nominal operating conditions.
- A survey was conducted on 30 volunteers to evaluate ease of use and design elegance of GUI. The final score was a 3.87 out of 5.

Outcomes
- The sponsor can now monitor the productivity of the stamping machine from a remote location.
- Issued and data can now be observed real-time.
- The GUI features alerts for quick diagnosis, historical data for trends in manufacturing, and a pause for management to gain deeper insights into their performance measures.
- These features reduce non-value added tasks such as miscommunication, false diagnosis and machine downtime.