



AI-enabled machine control enhances productivity

Client background

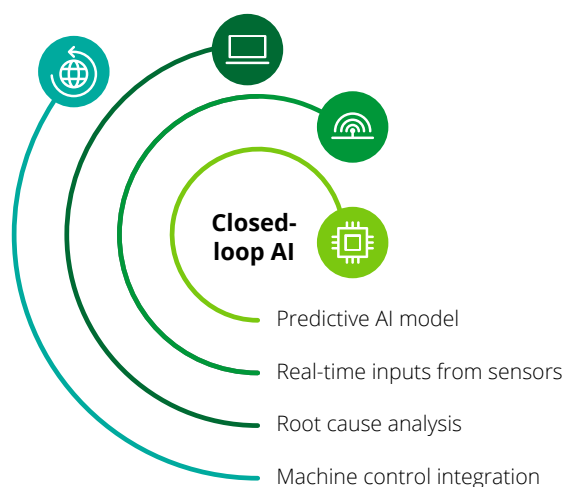
A multinational metal manufacturer needed to increase output within its current footprint but struggled with capacity constraints exacerbated by increased demand. Vibration spikes affected product quality and machine integrity, causing operators to run the line below the target speed, ultimately reducing productivity.

Solution

Deloitte partnered with the client to use AI, machine learning, and automation to predict when vibration would occur and automatically adjust the speed, decreasing downtime, reducing scrap, and minimizing potential damage.

Our innovative approach was deployed within the client's existing system and quickly achieved workforce adoption. Our Smart Manufacturing team:

- **Harnessed AI:** Deployed an AI-driven predictive model into the machine to anticipate vibration spikes and adjust speed without manual intervention. Using real-time inputs from sensors, the control system, and product data, the model delivers speed changes and alerts almost immediately.
- **Created interchangeable model:** Designed the solution to address the vibration issue using a modular architecture capable of sending and receiving data to an edge model in near real time to address other factory challenges. Providing such flexibility in the model enables other factory solutions as well as the ability to scale to other plants.
- **Integrated with plant systems:** Provided analytics and reporting capabilities that allow operators to view key drivers of predicted vibration, perform root cause analysis and corrective action, track overall solution impact, and monitor performance.



Impact

100%

adoption rate in first month of operation

\$6.5M

in saving annually*

2.5%

improvement in productivity loss*

4%

cycle time reduction*

*Last three metrics projected over the first year.