



CASE STUDY: Automating a Two-Lathe Cell System to Improve Efficiency

Situation

A mid-sized manufacturing company specializing in precision metal components operated a two-lathe cell system. Each lathe required manual loading/unloading of parts, tool changes, and quality checks. One operator managed both machines, leading to inefficiencies, inconsistent cycle times, and ergonomic strain. The company needed to address the situation, so they partnered with QSI to achieve specific goals:

- Increase throughput and machine utilization
- Improve consistency and quality
- Reduce labor costs and ergonomic risks
- Enable lights-out manufacturing capability

Key Challenges

- Labor Dependency: One operator could not consistently keep both lathes running at full capacity
- Cycle Time Variability: Manual handling introduced inconsistencies
- Quality Control: Manual inspections were prone to human error
- Ergonomics: Repetitive tasks led to worker fatigue and increased risk of injury

QSI Solution

Designing automation with robotics and smart sensors.

System Design

- Robotic Arm: A 6-axis industrial robot was installed between the two lathes to manage part loading/unloading
- Vision System: Cameras and sensors were added for part orientation and quality checks
- PLC Integration: A system was installed to coordinate robot movements, machine cycles, and safety interlocks

Workflow

- Raw Part Loading: Robot vision picks parts from a conveyor
- Lathe Operation: Robot loads part into Lathe A for OP1 machining. When the part from OP1 is completed, it reloads Lathe A, then moves OP1 part to Lathe B. Completed part from OP2 is then unloaded to outfeed conveyor for final inspection.

Results

After implementation of the automation, the cell routinely set daily and monthly output records for all variations of parts that were programmed on the cell.

- In some cases, the output of the cell was doubled from its previous throughput.
- Setup time was cut in half.
- The new throughput allowed the transfer of over 40 new part numbers from another manufacturing facility to be completed on this cell.

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