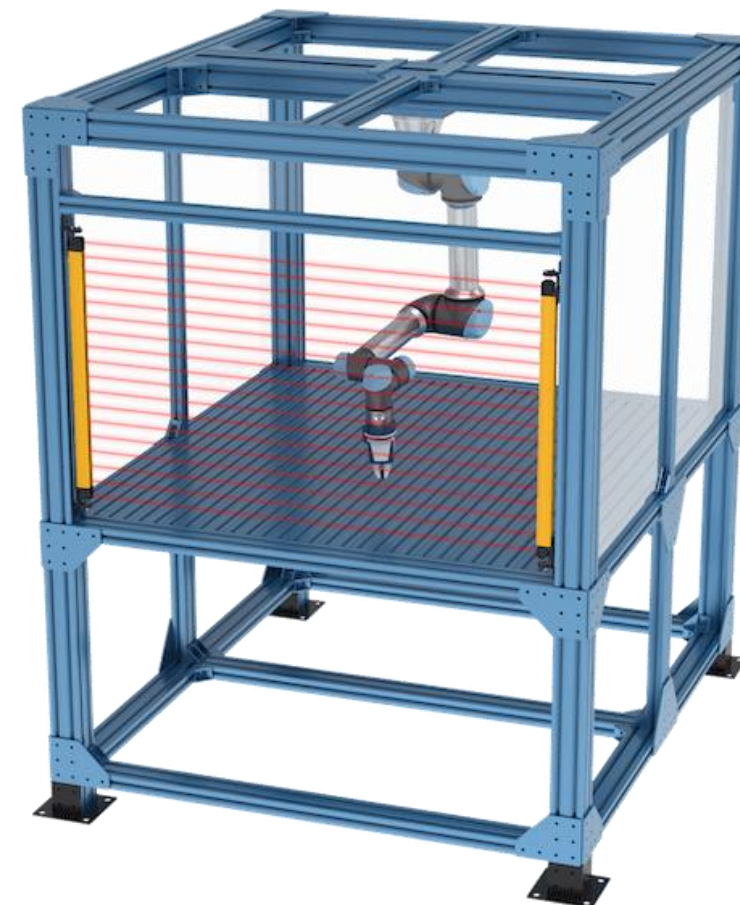


MANUFACTURING PROJECTS

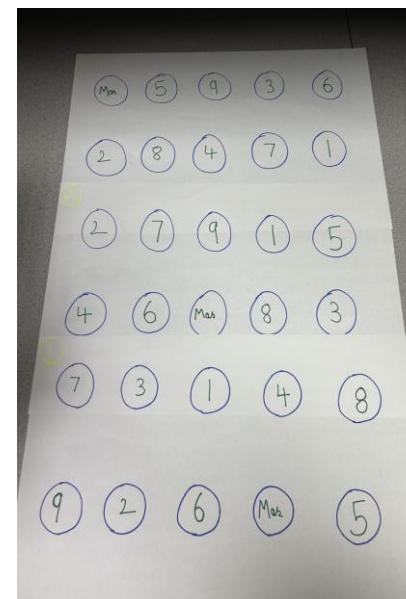
Inspection Process Optimization and Cell Relocation

- **Situation:**
Inspection of manufactured parts was performed in a separate quality room, causing up to 3 days of delay and high scrap costs due to production bottlenecks.
- **Task:**
Reduce inspection lead time and improve workflow efficiency by enabling on-floor quality checks without compromising the stability and accuracy of the measurement equipment.
- **Action:**
 - Conducted a detailed **Value Stream Map** and **time study** to identify root causes of downtime
 - Proposed relocating the inspection machine to the production floor to eliminate transport waste
 - **Designed** a temperature-controlled HDPE enclosure in Vention to ensure measurement accuracy under shop floor conditions
 - **Collaborated with suppliers** and management to coordinate fabrication and approval
- **Result:**
Reduced inspection time from 3 days to **7 minutes**, eliminated unnecessary transport and waiting waste, and contributed to **\$200,000 in annual scrap cost savings** through faster feedback and improved process flow.



Gage Repeatability & Reproducibility

- Situation:**
 The QA department relied on inspection gauges that had been in use for years without revalidation, creating uncertainty around the accuracy and trustworthiness of measurement data.
- Task:**
 Assess the reliability of existing measurement systems to determine if they still produced consistent and repeatable results across operators and devices.
- Action:**
 Planned and executed a full **GR&R** study following MSA (Measurement System Analysis) methodology; collected data from multiple operators and measurement runs; **analyzed repeatability** and **reproducibility** using statistical tools to quantify variation.
- Result:**
 Verified the capability of critical measurement gauges, ensured confidence in inspection data, and established a periodic verification process to maintain long-term measurement integrity.



Inspection Location	Sub Categories	%Contribution	Total GR&R (%Contribution)
Middle	Equipment Variation	24.69	34.14
	Appraiser Variation	9.18	
Top	Equipment Variation	12.76	13.95
	Appraiser Variation	1.79	
Bottom	Equipment Variation	47.15	47.79
	Appraiser Variation	0.64	



Wheels and Shell Manufacturing for RC car Remodeling

- **Situation:**
A university design project required improving the performance and cost-efficiency of an existing remote-controlled car model.
- **Task:**
Redesign major components to enhance performance, manufacturability, and aesthetics while minimizing overall project cost.
- **Action:**
Led mechanical design using SolidWorks; designed new wheels and shell; Performed tensile and **3-point bending tests** to select suitable chassis materials; **3D printed** and **thermoformed** the shell for improved rigidity and finish.
- **Result:**
Reduced overall cost by 26% and improved vehicle handling and durability.

