

Problem Statement

MiraVista Diagnostics is currently experiencing several quality and ergonomics issues. Many workstations and positions require awkward reaches, unnecessary motion, and standing for long periods. As for quality, specimens lost in the laboratory cause an increase in process time and a decrease in the same-day testing percentage. A dated workflow and a highly manual process in the workstations leading up to testing cause visible problems. Looking beyond the surface, these overarching issues consist of poorly designed workstations, a lack of visibility in the receiving process, and nonstandard packing practices from the client.

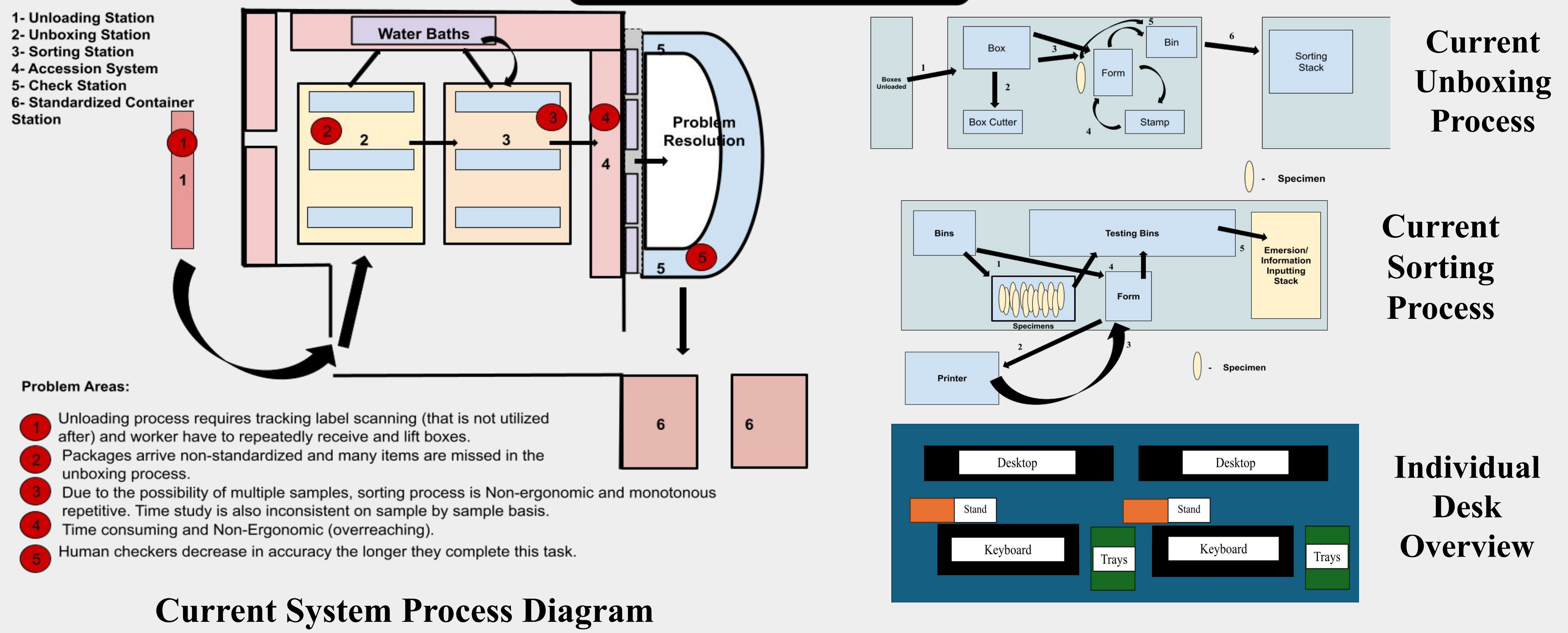
Client Background

Who are they? MiraVista Diagnostics is a certified mycology laboratory that specializes in processing diagnostics test for serious fungal infections.

What do they do? They offer same day testing, timely responses, fast shipping, and direct access to their team of experienced infectious disease specialist.

What is a little bit of their history? MiraVista Diagnostics was founded in 2002 by Dr. Joe Wheat, renowned for his contributions to the first histoplasmosis antigen test. Since then, they have processed almost a thousand samples a day.

System Flow



Methodology

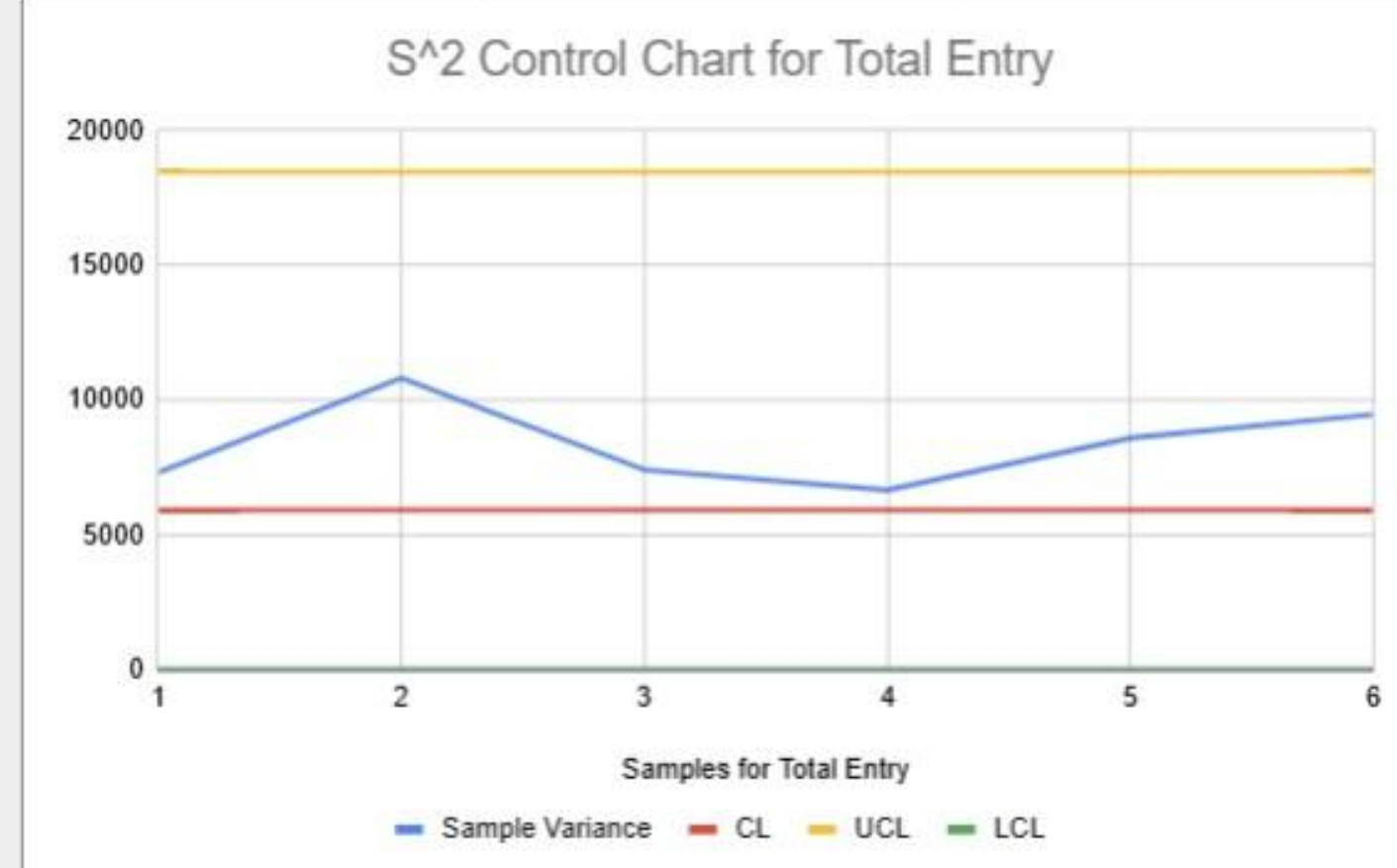
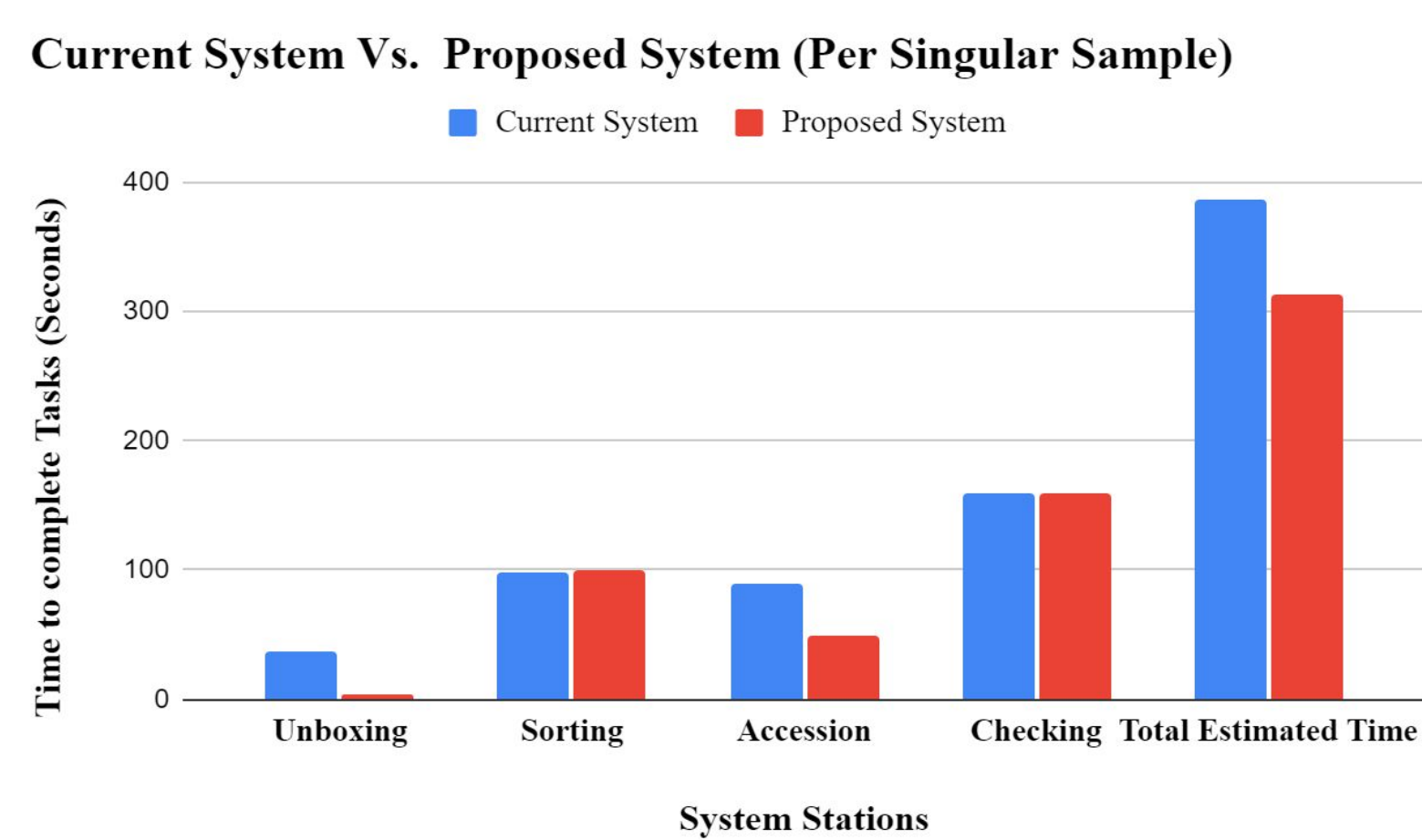
- **MTM Analysis:** Measures Time Study comparisons between the Current and Proposed Process
- **ROI:** Tool to measure Return On Investment
- **Pilot Prototype:** Team conducted a pilot for Proposed System and Process
- **Shewhart Process Control Charts:** System Quality Control Analysis
- **Reach Envelope:** Tool to justify Desk Resource locations

Discussion

- According to MTM, the new system reduces FIFO inconsistencies, reduces sample throughput time, and decreases overall process time by at least 18% if implemented correctly.
- According to the 5th Percentile Reach calculations, seated Females can reach around 14 inches, so the most used equipment was placed within this range.
- Based on Pilot data, the proposed process predicts a 86% reduction in process time.
- According to Shewhart Process Control Chart, statistically the quality of the process is stable.
- Estimated ROI is 30.70% and profitability is estimated at a 130% increase.

Results

Analytics



MTM Time Study Comparisons

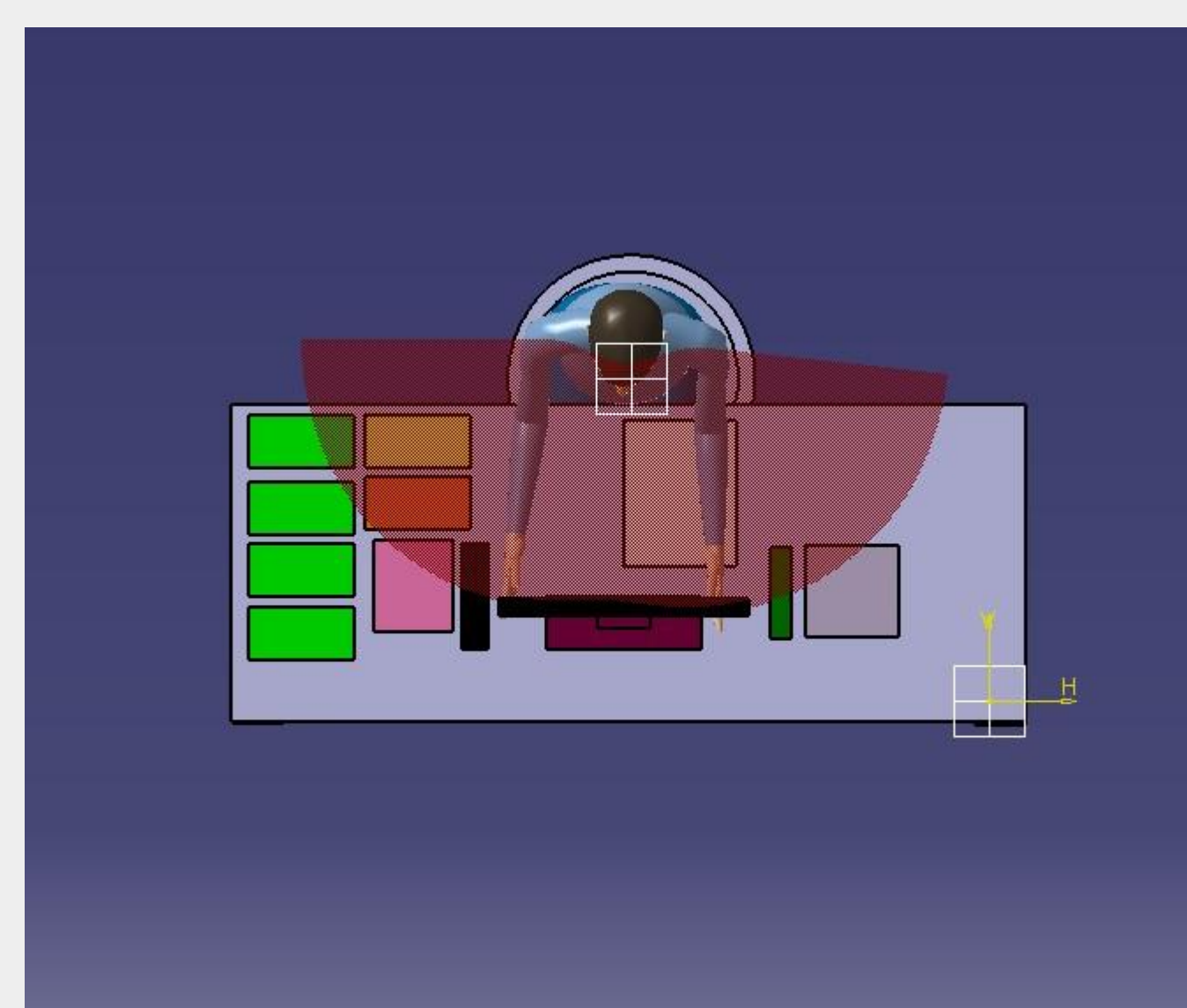
Avg Samples per Shipment	3
Work Shift (s)	28800
Current Daily Capacity (samples)	1000
Tolerance for Other Activities	10.00% (48 minutes)
Ratio of 8 Hour Shift Consumed	0.7109363233
Projected Capacity for Samples Tested	1265.936161

Pilot Data Projected Capacity Increase

Model	EOY	Inflated Net Income	Cash Flows	P(0)	Annual Overall ROI
Current Model	0	\$0.00	\$0.00	-\$71,113.00	0.00%
	1	\$16,977,928.47	\$15,977,928.47	\$14,525,389.52	30.30%
	2	\$16,776,828.89	\$16,776,828.89	\$13,865,144.54	30.27%
	3	\$17,615,666.13	\$17,615,666.13	\$13,239,910.69	30.24%
	4	\$18,496,449.44	\$18,496,449.44	\$12,633,323.84	30.20%
	5	\$19,421,271.91	\$19,421,271.91	\$12,059,081.85	30.20%
Total		\$88,288,140.84	\$88,288,140.84	\$66,317,850.44	
Future Model	0	\$0.00	-\$71,113.00	-\$71,113.00	0.00%
	1	\$20,921,090.85	\$20,921,090.85	\$18,019,173.32	30.30%
	2	\$21,967,145.18	\$21,967,145.18	\$18,154,665.44	30.27%
	3	\$23,005,502.44	\$23,005,502.44	\$17,329,453.38	30.24%
	4	\$24,218,777.56	\$24,218,777.56	\$16,541,750.95	30.20%
	5	\$25,429,716.44	\$25,429,716.44	\$15,850,443.92	30.20%
Total		\$115,602,232.28	\$115,602,232.28	\$86,174,374.01	30.71%

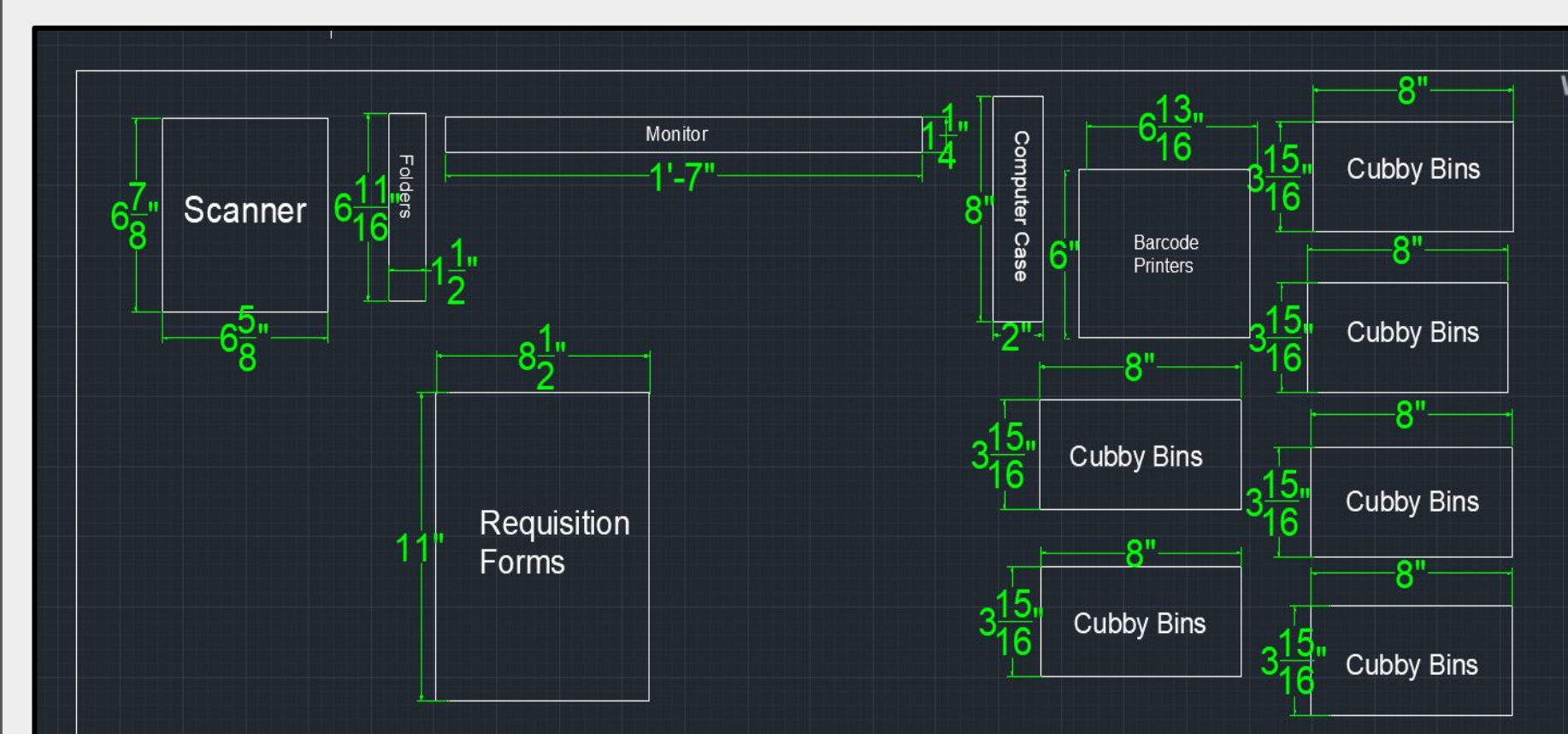
ROI/Cash Flow Projections

Total Entry S² Control Chart

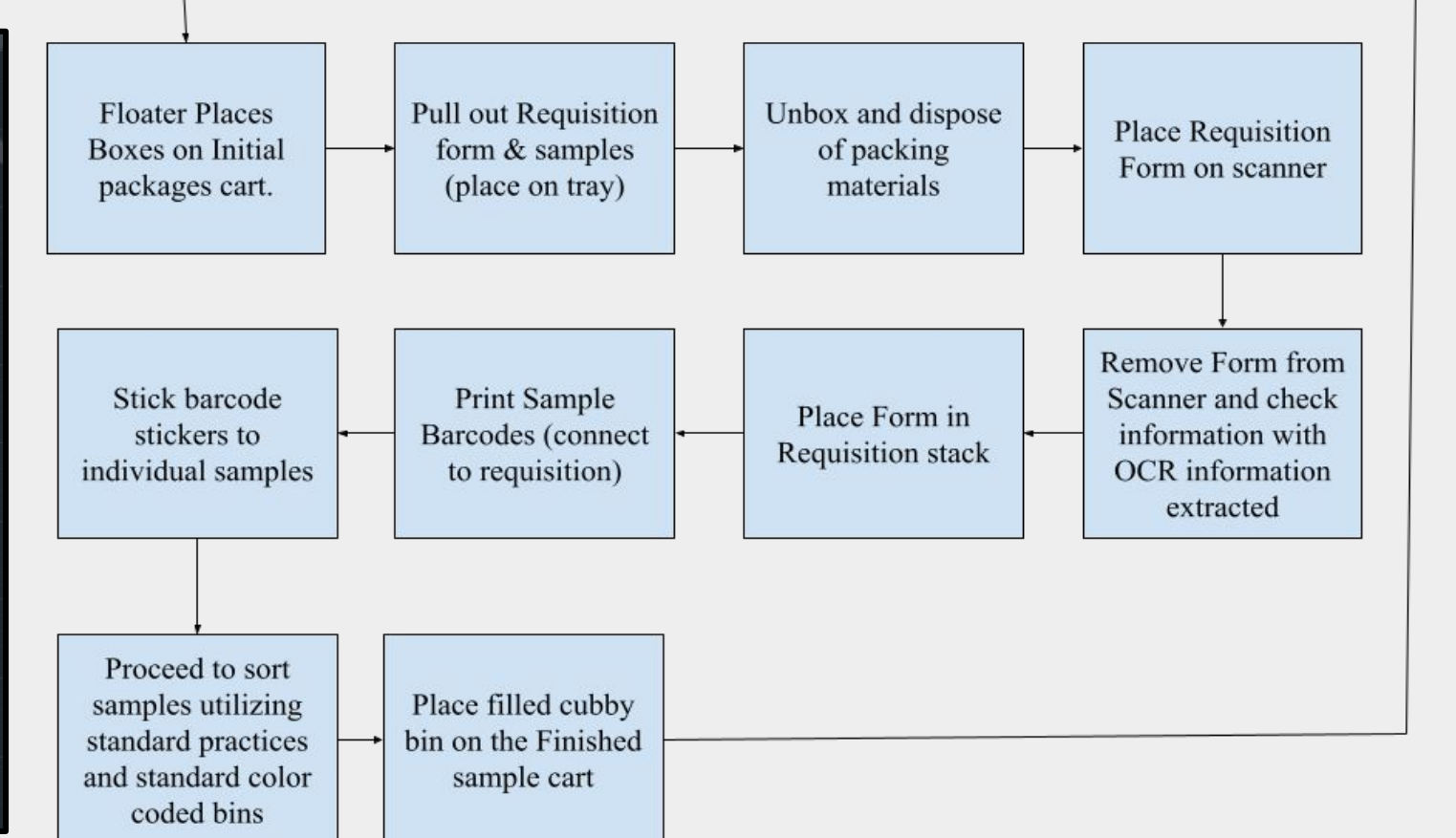


Final Reach Envelope Simulation

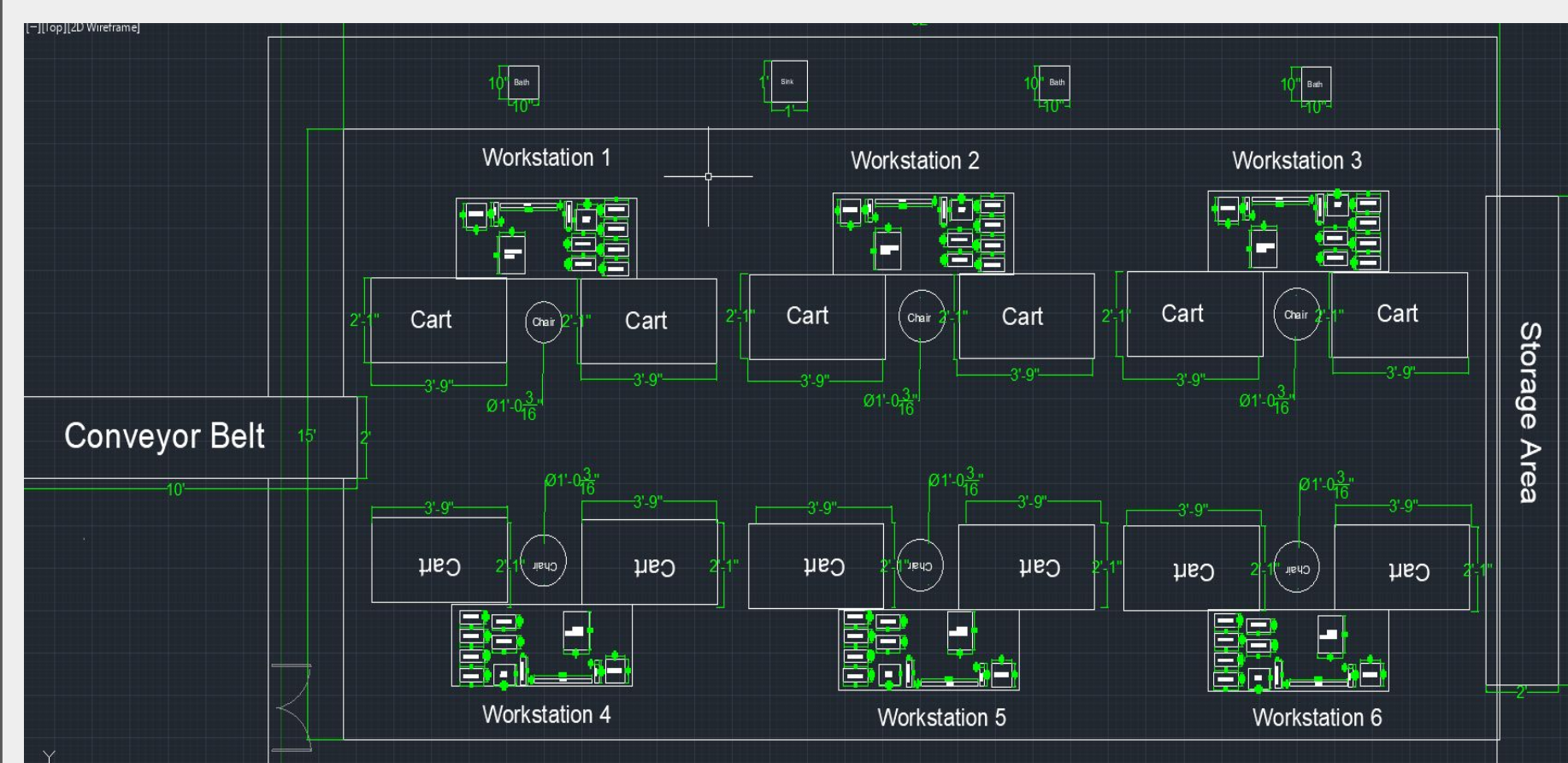
Proposed System Design



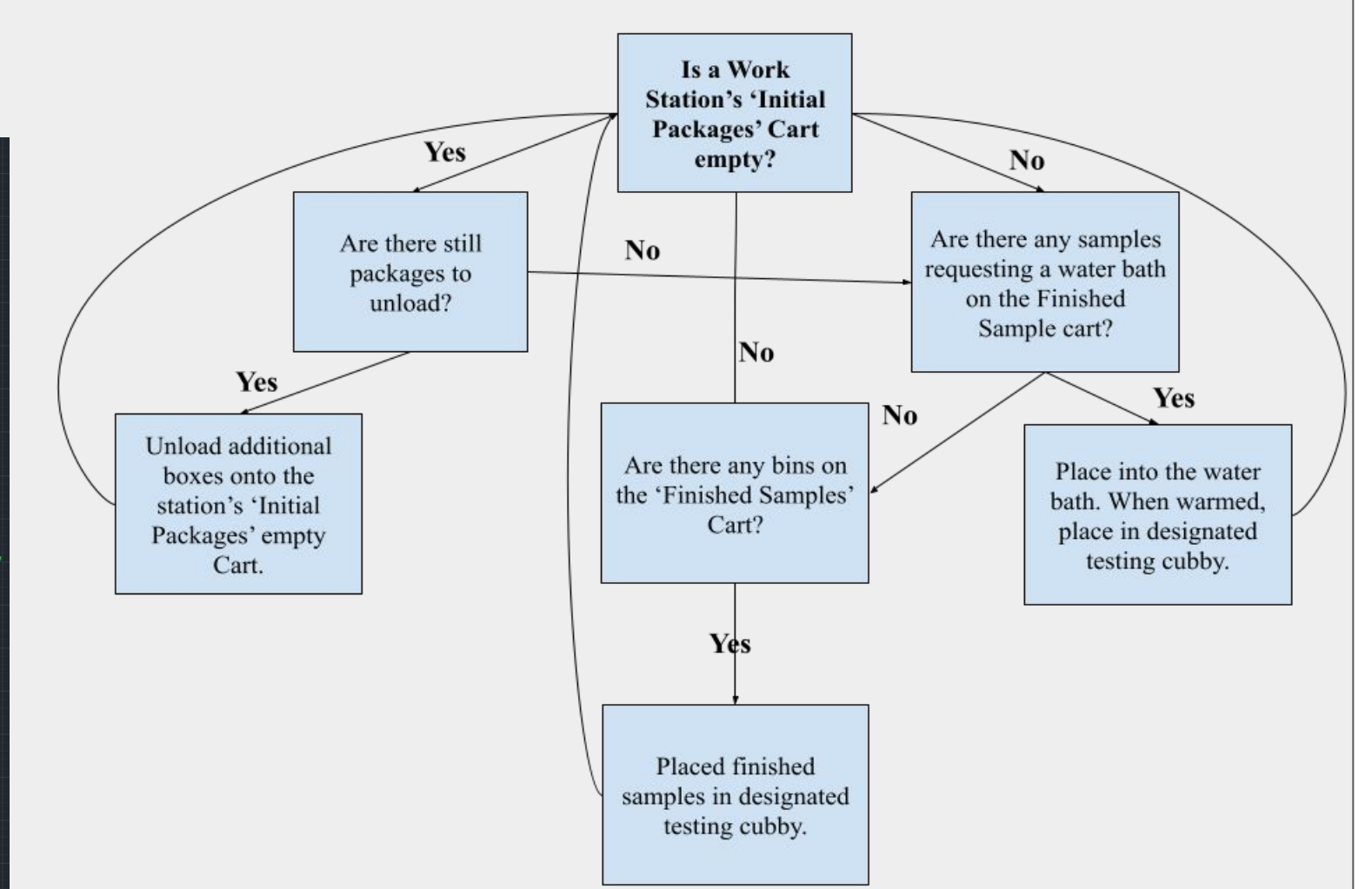
CAD Workstation Desk Layout



Proposed Workstation Desk Process Flow



CAD Workstation Lab Layout



Proposed Floaters Process Workflow