



# COCA-COLA BOTTLENECK PROJECT

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## Define

The project focused on eliminating bottlenecks and downtime in Coca-Cola's labeling and capping stations, which caused over 59% of total line stoppages. The goal was to improve reliability, throughput, and product quality through predictive maintenance, workflow redesign, and operator training.

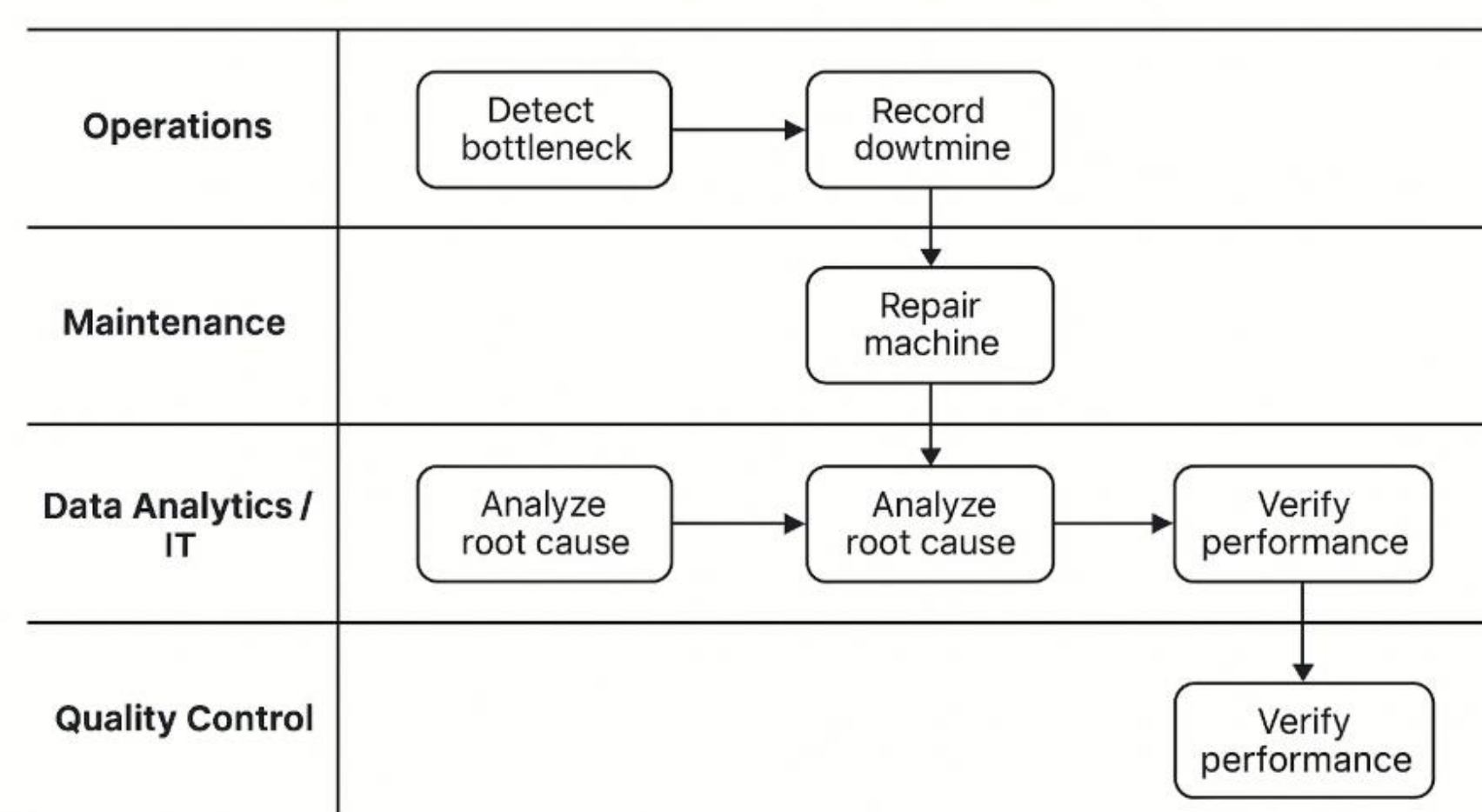
### Key Metrics:

Metric	Baseline	Target	% Change Goal
Downtime (hr/machine)	5.8	≤ 4.2	-27 %
Throughput (bph)	1,000	≥ 1,150	+15 %
Failures per week	10	≤ 6	-40 %
Defect Rate (%)	4.5	≤ 2.0	-55 %

## Measure

During this phase, Coca-Cola's bottling line performance was quantified using MES logs, IoT sensors, QC records, and time studies to establish a solid baseline of efficiency and variation. The labeling and capping stations were verified as the main bottlenecks responsible for downtime and throughput loss.

COCA-COLA BOTTLENECK PROJECT MEASURE PHASE - SWIM LANE DIAGRAM

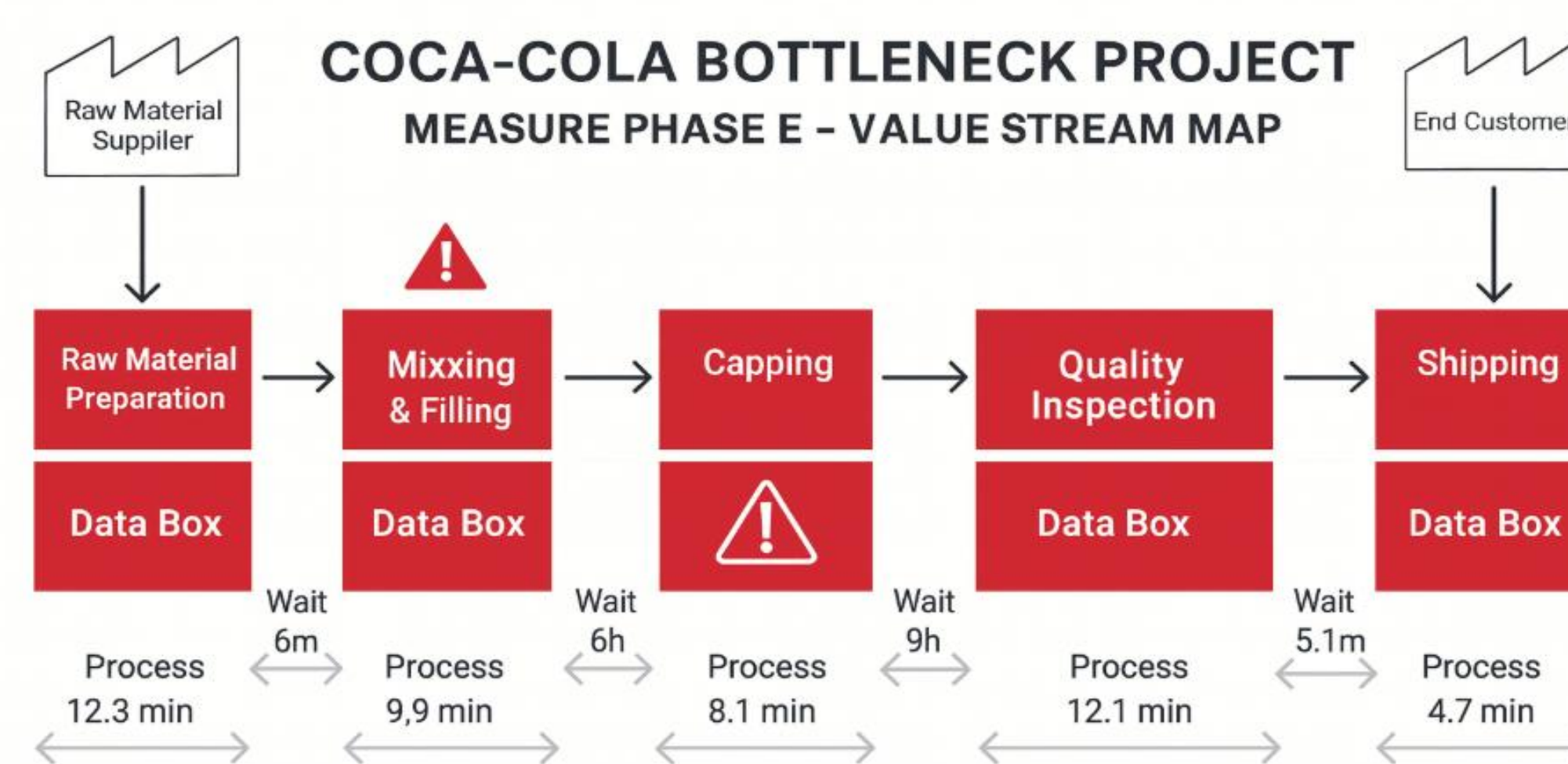


Swim Lane Diagram defined each department's role in detecting, reporting, and resolving downtime — aligning Operations, Maintenance, IT, and Quality to ensure synchronized response and accountability.

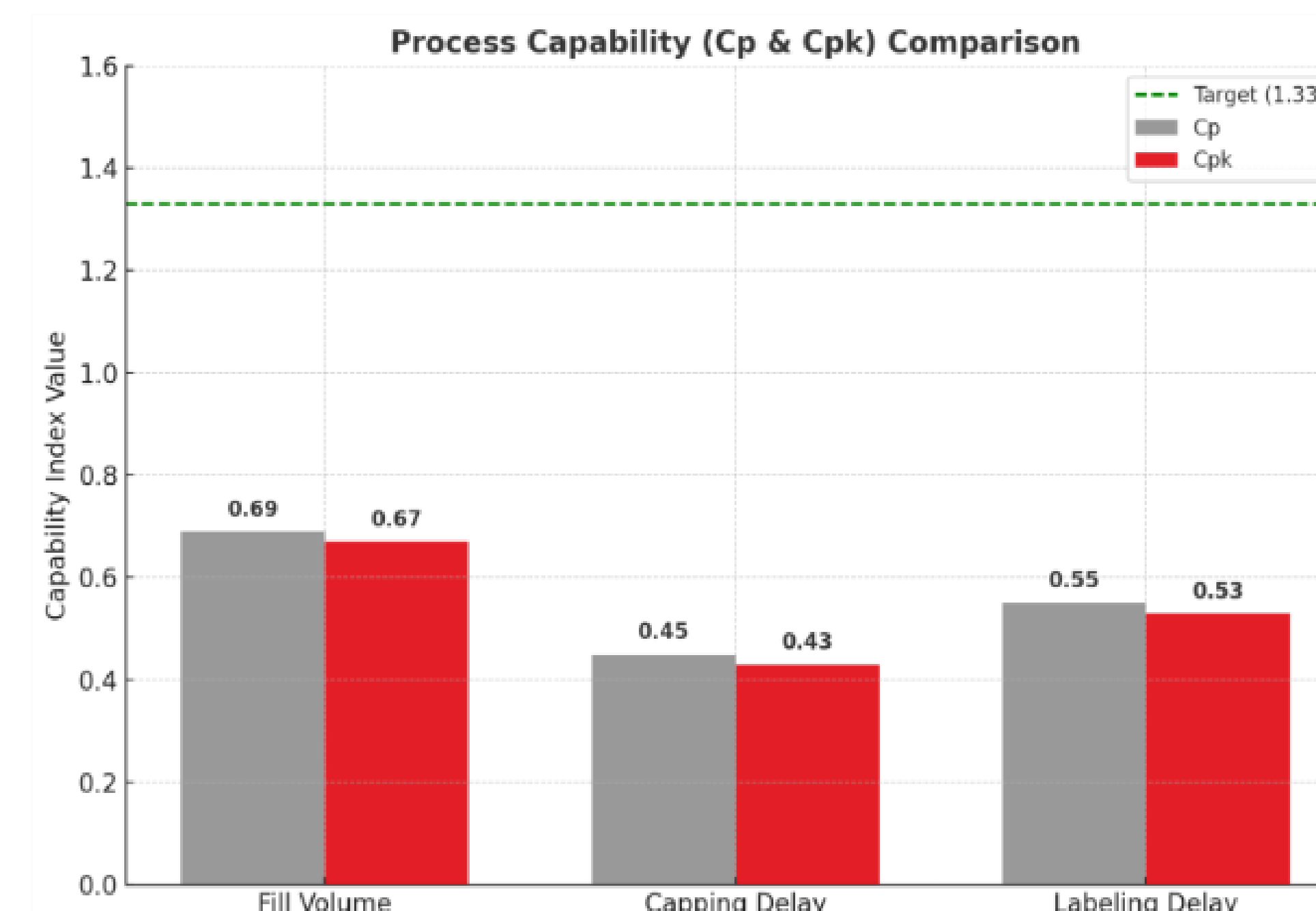
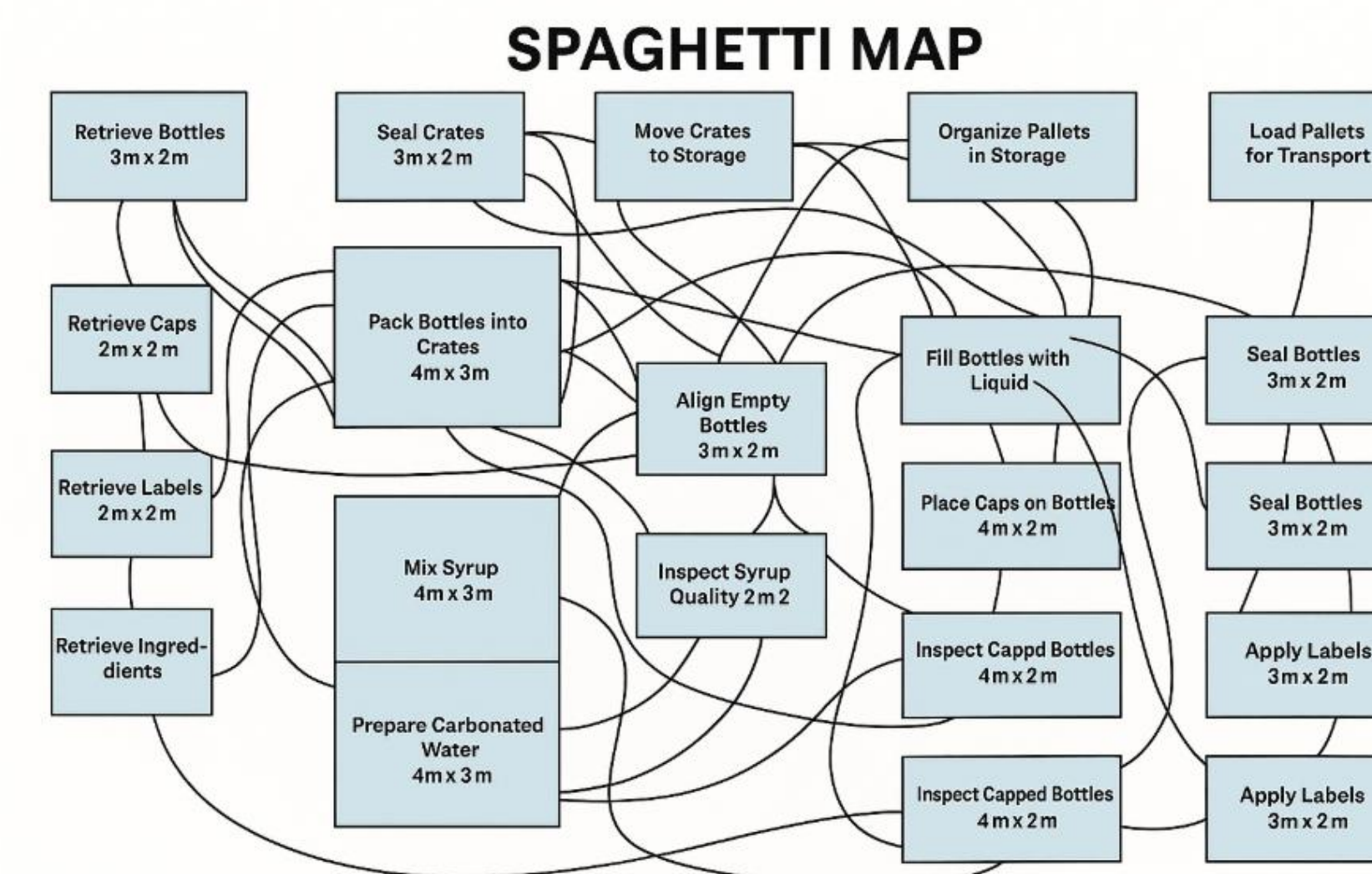
## Measure

Value Stream Map (VSM) traced every step from Raw Material Prep to Shipping, revealing:

- Total cycle time (CT): 62.6 min
- Total wait time (WT): 37.7 min
- Lead time (LT): ≈100 min, with 38 % non-value-added time due to waiting, inspection delays, and bottlenecks.



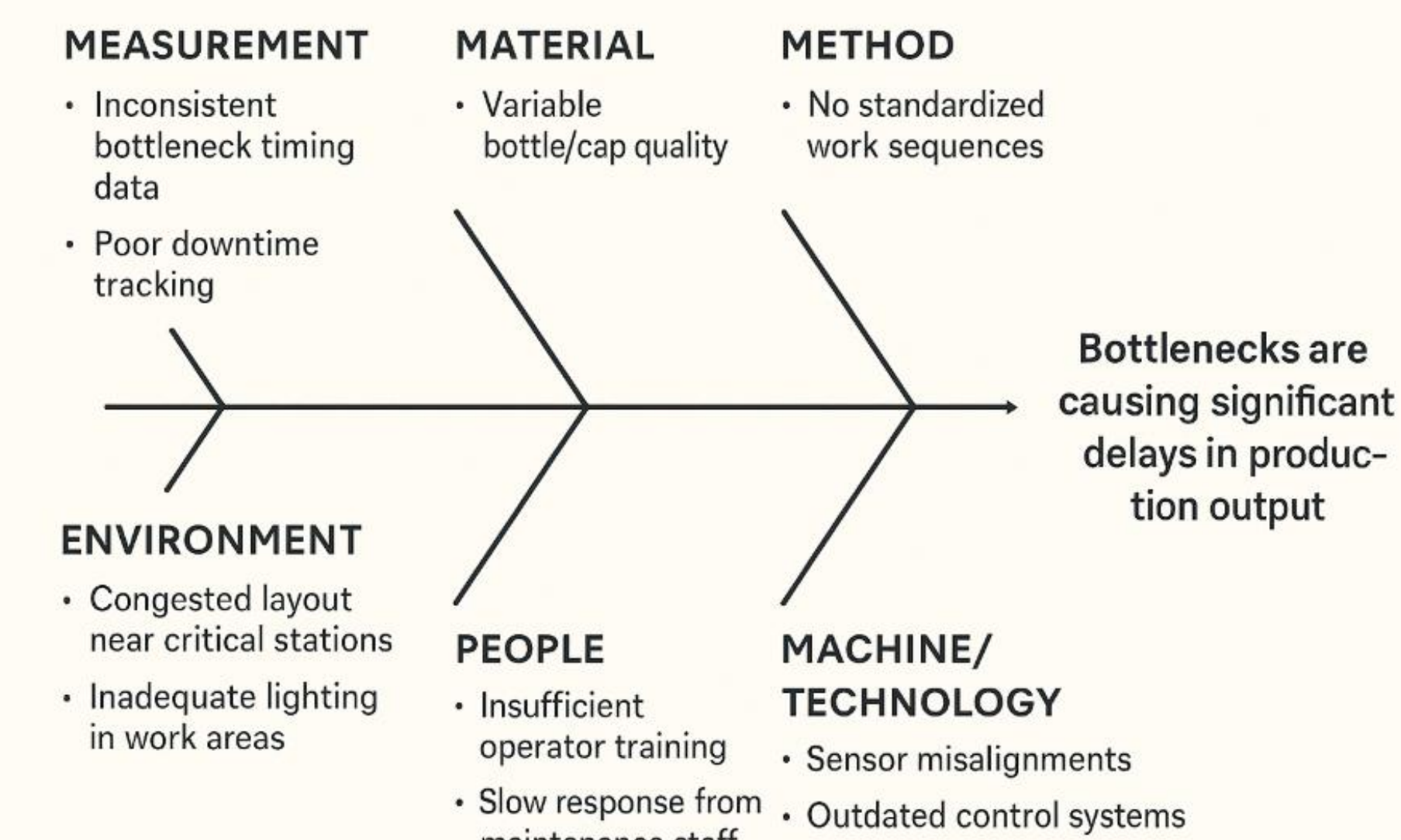
The Spaghetti Map visualized operator movement across stations, totaling 73 m walked per cycle, showing wasted motion and poor workstation layout.



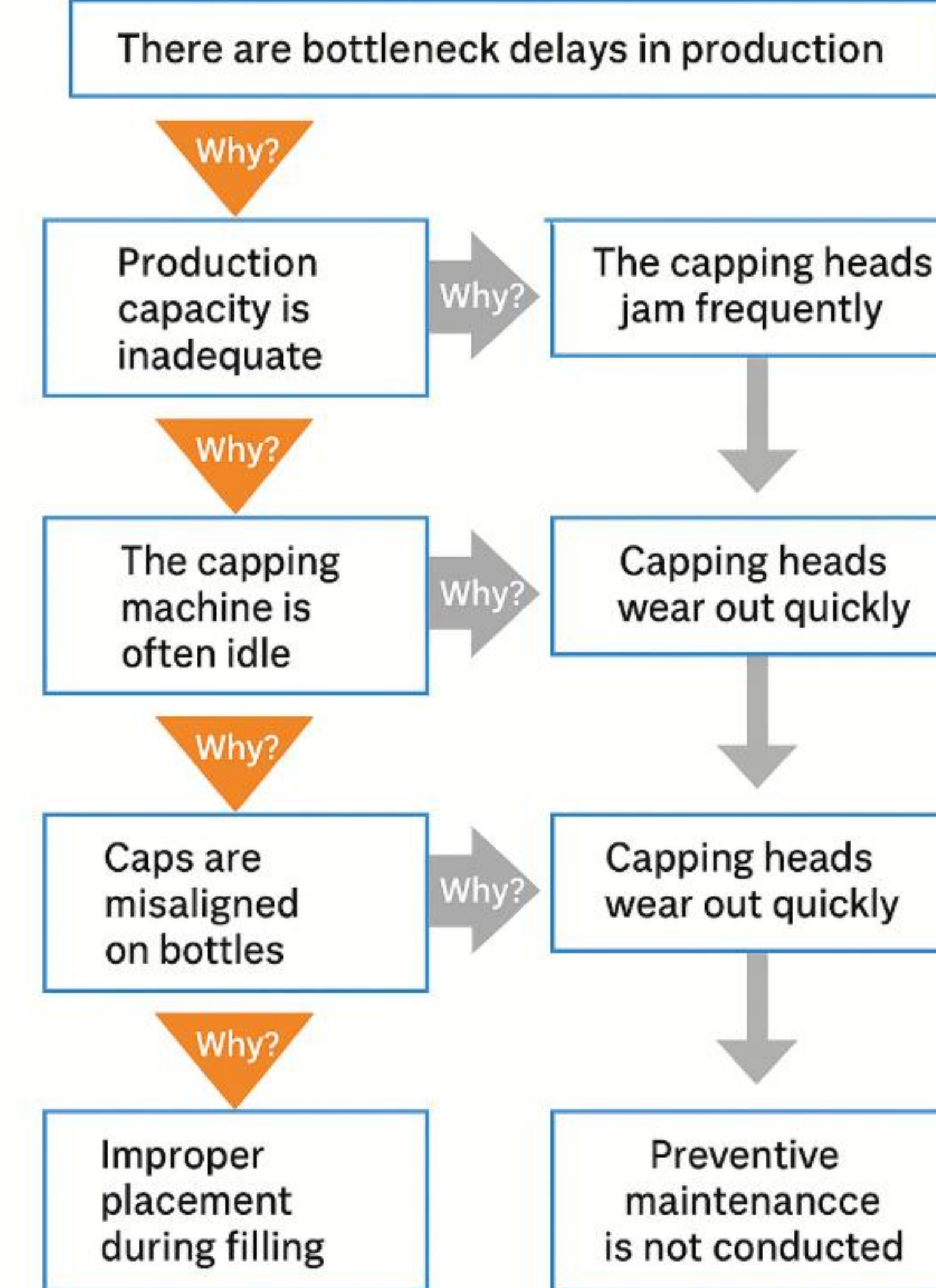
Capability Bar Chart – compares Cp and Cpk across Fill Volume, Capping, and Labeling. Shows that Fill Volume (Cpk = 0.67) performs best but is still below the 1.33 target.

## Analyze

### Fishbone Diagram



### 5 WHYS ANALYSIS

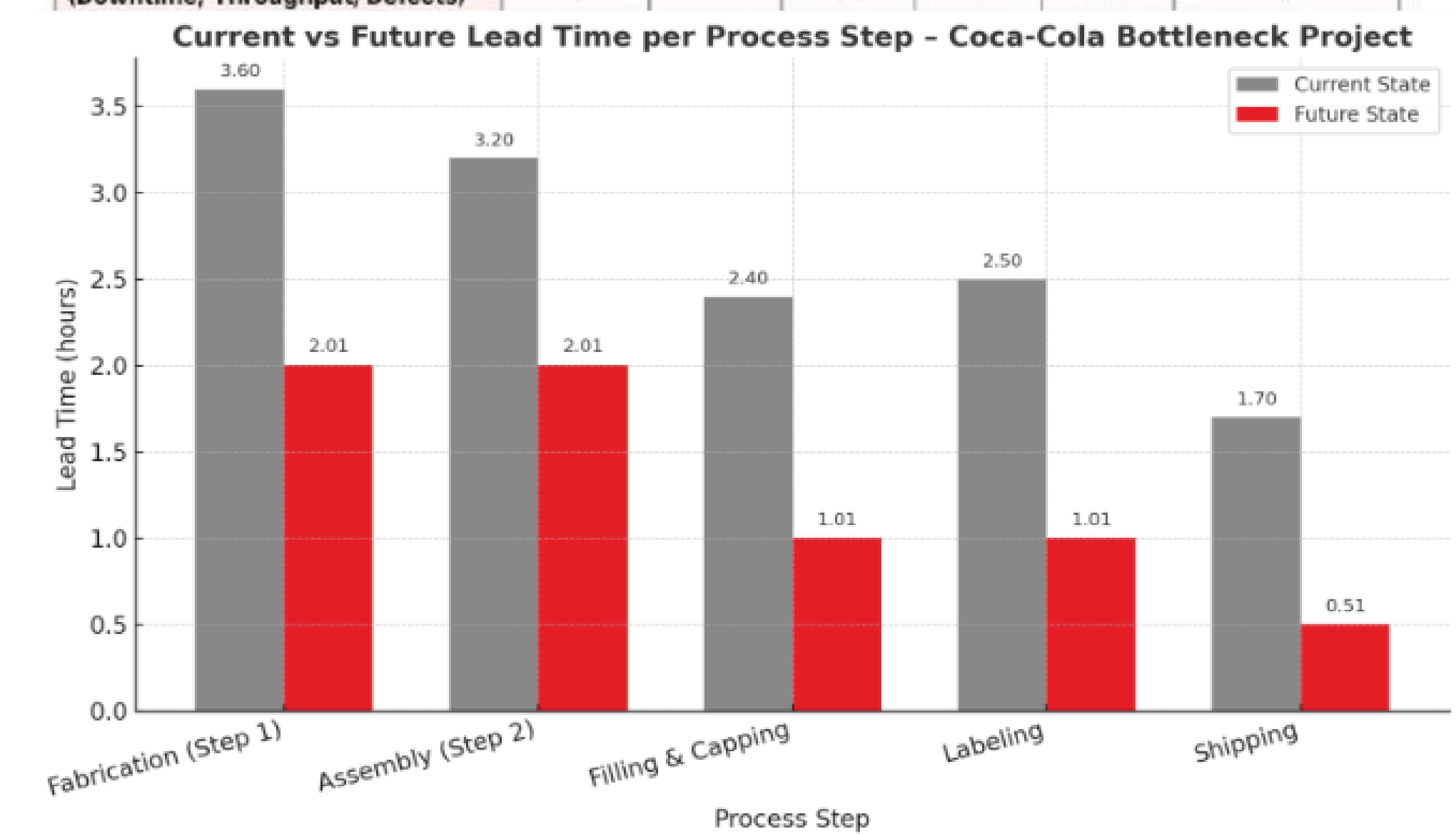


The 5 Whys Analysis identified that frequent stoppages at the Capping and Labeling stations were caused by torque sensor drift, worn rollers, and inconsistent jam-clearing procedures.

## Improve

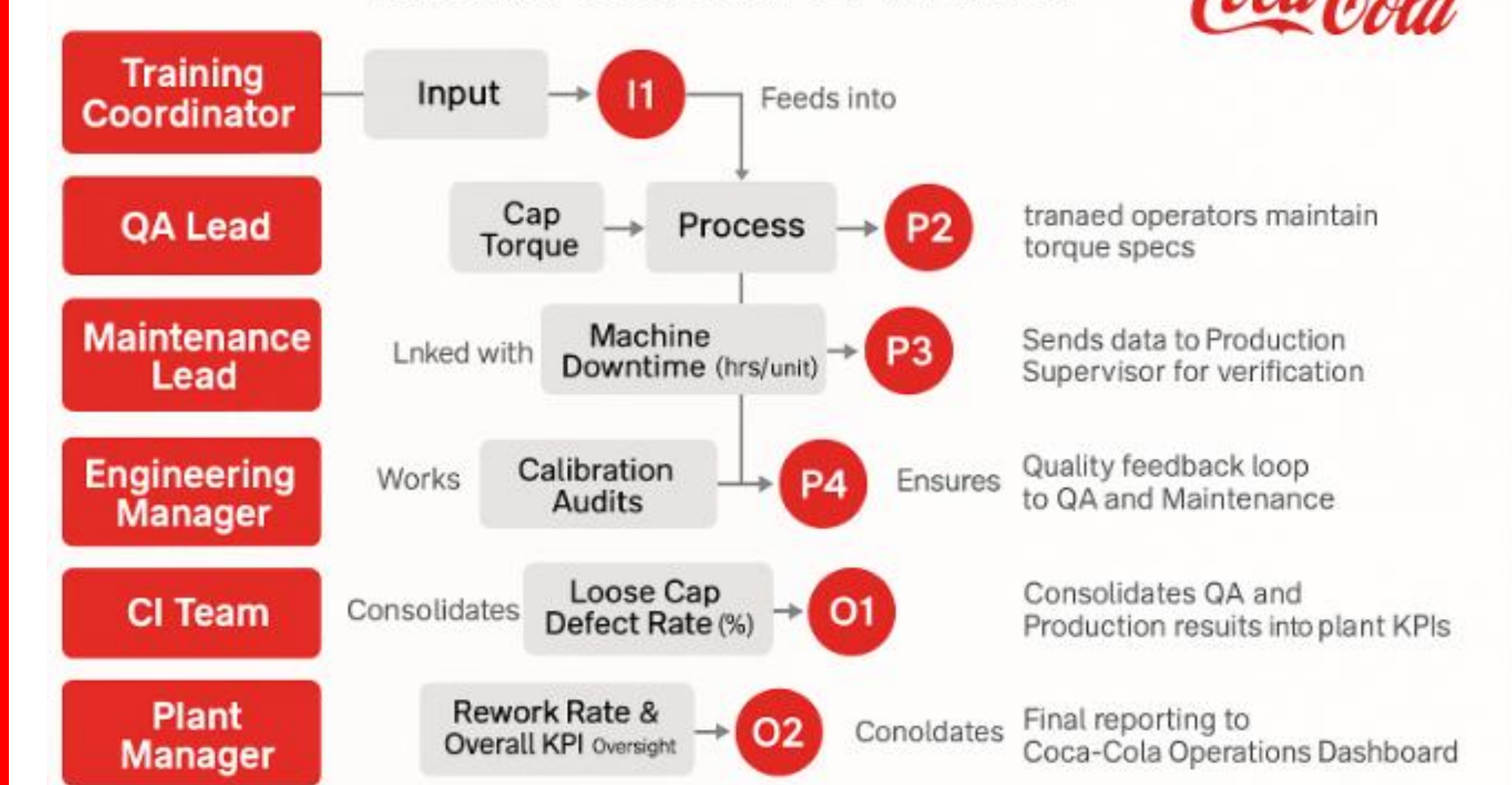
### RACI MATRIX – IMPROVE PHASE

PROCESS / IMPROVEMENT ACTIVITY	Operations Manager	Maintenance Supervisor	Maintenance Technician	Quality Control (QC)	HR / Training Coordinator	Procurement / Coordinator
Implement Predictive Maintenance Systems	A	R	R	I	I	I
Weekly Torque & Labeling Calibration Checks	AR	R	C	I	I	I
Update Standard Operating Procedures (SOPs)	A	A	R	I	A	I
Operator Upskilling & Training Sessions	A	C	C	IR	R	I
Install Real-Time IoT Monitoring Dashboards	R	C	R	R	A	I
Maintenance Alert Integration with MEB	A	R	A	R	A	I
Workflow Redesign to Reduce Bottlenecks	A	R	A	R	AR	I
Process Validation & Quality Testing	AR	R	C	A	A	I
Monitor KPI Progress (Downtime, Throughput, Defects)	A	R	C	C	A	I



## Control

### MONITORING PLAN MAP



### Process Control Plan

