

Client Background



7-Eleven, a leading global retailer, has about **13,000 U.S. stores** in 2024, including around **3,800 under the Speedway banner**.



Bruegmann USA **manufactures retail merchandising solutions**, with offices or production in 7 countries, leading globally in displays and fixtures.

Methodologies



Time Study

- Duration of time restocking
- Frequency of restocking
- Recording time log sheet



Interview Employees

- Questions on the process and their perspective



Data Analysis

- T-test
- Find confidence interval
- Variance based on data



RULA test

- Identify levels of risk
- Evaluated ergonomic strain posture

Test Store RULA Analysis

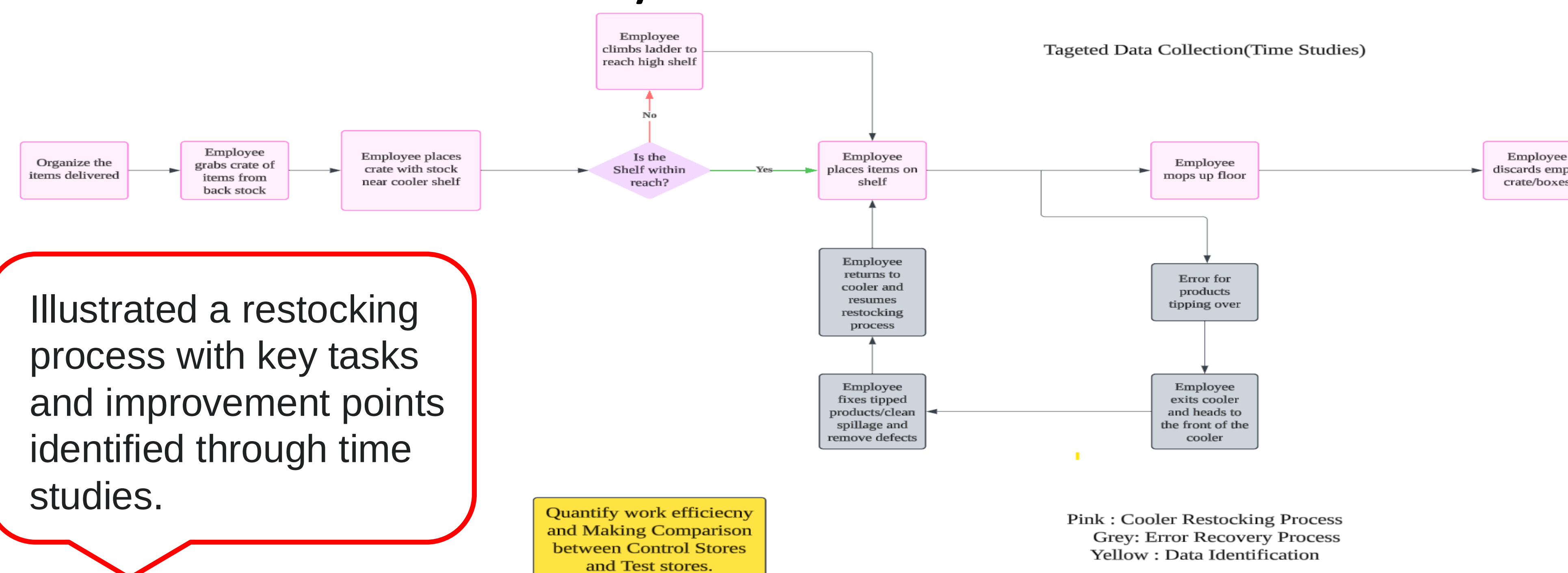
RULA Component	Score	Notes
Posture Score A	4	Arm above shoulder, wrist bend are contributing factors
Wrist & Arm Score	6	Repetitive motion and intermittent load contributing factors
Posture Score B	5	Bent trunk position and tilted neck are contributing factors
Final RULA Score	6	Further investigation and changes are required soon

- Deeper shelves have **reduced the movement** from back stock to cooler shelves (involves moving the heaviest items)
- Future RULA scores will reflect **lower risk** levels
- This improvement will be **especially** noticeable in the **force/load category**

Problem Statement

The client **lacks a system** to monitor **labor activities**, measure restocking time, and **analyze cold vault operations** spatially. They also struggle to quantify efficiency gains from reduced stocking time in the cold vault. As a result, labor time increases, product availability becomes inconsistent, and back stock **inventory remains disorganized**. These inefficiencies contribute to higher employee turnover, increased operational costs, and lost sales opportunities.

System Model



Impacts

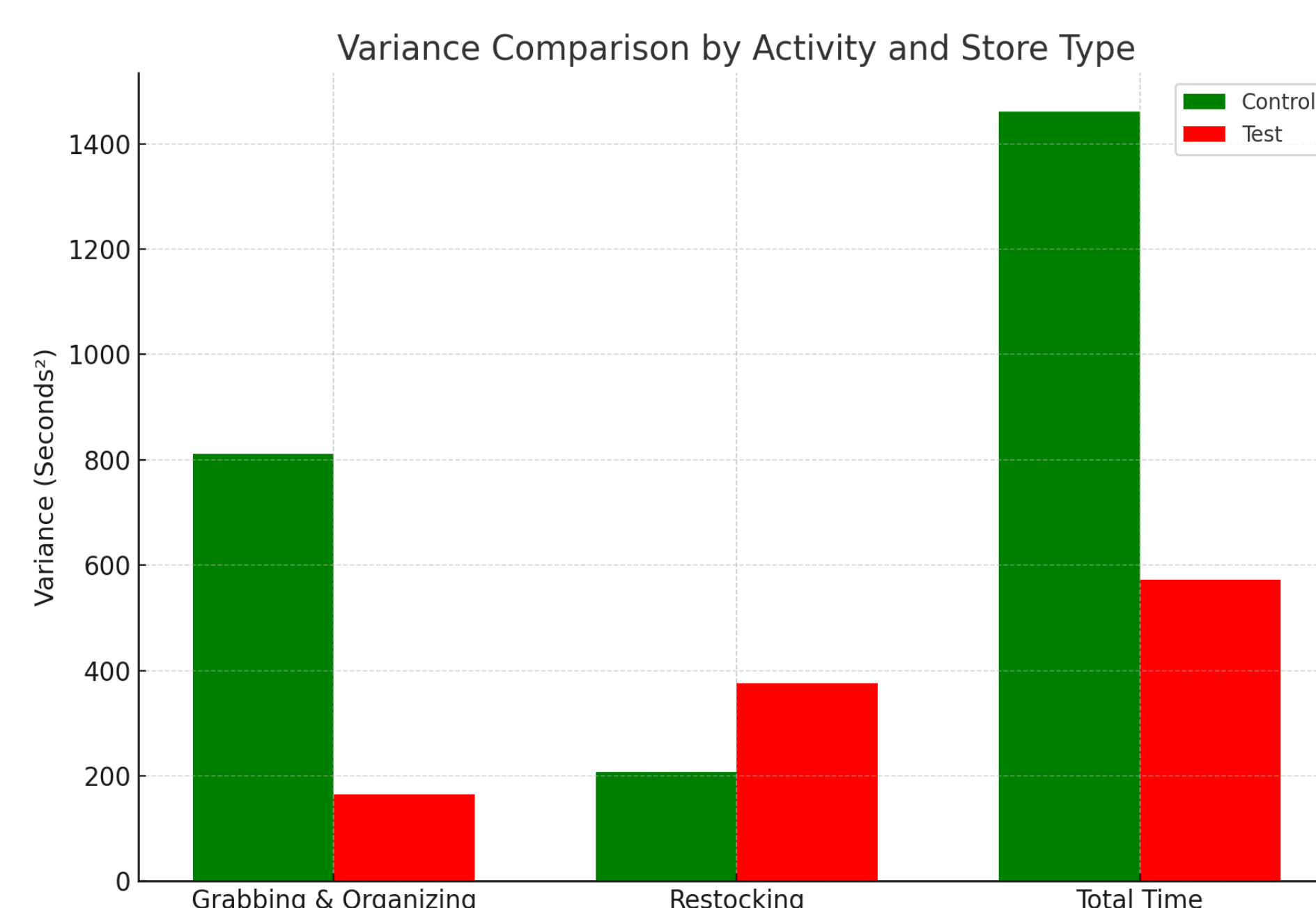
With 95% confidence, Test Store **saves 6.67 - 34.39 minutes** per stocking session compared to Control Store 1

Implementing deeper shelves **reduces risk** in the RULA force/load category

Spending less time in cooler **improves worker morale** and retention

Result

Variance Comparison



7-Year ROI with 81% sales uplift & Labor Savings

Scenario	ROI (low Labor)	ROI (High Labor)
Conservative	440.14%	456.87%
Moderate	926.14%	942.87%
Optimistic	1412.14%	1428.87%

Queuing Model

The queue discipline is **first in, first out** and the employee works intermittently but clears the queue when they restock.

	Test Store	Control Store 1	Control Store 2
Utilization	10.38%	9.08%	5.29%

Restocking is done in **batches**, not continuous, which explains the **lower utilization values**. The lower utilization values mean **no bottleneck**, the **system is reliable**, and the **labor is flexible**. Due to this, the **test store** is working the **most efficiently**.

Discussion



- Decrease in labor time spent in cooler will **help** with **employee retention**
- Combined with the uptick in sales will allow the deeper shelves to **pay back** the money invest in them in around **8 months**.