The Last Re-Sort: Improving Production Process of Donated Items

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Problem Statement

Production process is inefficient and excessively handles donations.

Goals:
- Compare preset to traditional process
- Decrease costs in:
  - Labor, production, transportation, and storage
- Apply lean six sigma techniques to improve both processes

Current State

- Donations are processed as needed at each store with traditional method
- Excess donations are transported to and stored in warehouses before being sorted for quality
- Salvage material remains in system longer than necessary

System Elements

- Retail
- Production
- Warehouse
- Outlet

Data

Collection - Time Studies
- Presort - South Everett
- Traditional - Shoreline
- 3 iterations at each station
- 20 minute observations
- Stations observed: Textiles, Shoes/Accessories, Wares, Linens

Data Cleaning

- Primary issues:
  - Outlier Control
  - Sample Size
  - Not accounting for speed/other factors
- Cleaning Techniques:
  - Outlier Removal
  - Rating Factor
  - Allowance Factor
  - Manager Confirmation

Simio Model

Ran experiment simulations with 10 replications for 30 days with a warm up period of 10 days to:

Measure:
- Number of items sorted and produced by product category
- Labor costs associated with each sorting method

In Order To:
- Select the more efficient practices based on throughput and costs
- Determine system bottlenecks

Created three different simio models to visualize how the sorting process is affected by fluctuations in donations

Results

Through Simio analysis, switching to hybrid leads to:

- 4.7% Linen Production
- 11.1% Wares Production
- 28.6% Textile Production
- 52.9% Shoes/Acc Production

Bottleneck is the textile sorting station with a system utilization of 88%

Recommendation

- Implement hybrid sorting process
- Place more experienced workers at the front of production, in sorting stations
- Add a flag at each station to signal for material handlers:
  - Minimize employee time away from station
  - Maximize utilization of material handlers
- Sort all product for quality, make RTS boxes for all categories, regardless of sorting process