

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

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Thank you to our sponsors Brent Frerichs, Melinda Gillcris, and Patty Buchanan!

## Problem Statement

Production process is inefficient and excessively handles donations.

Goals:

- Compare presort 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

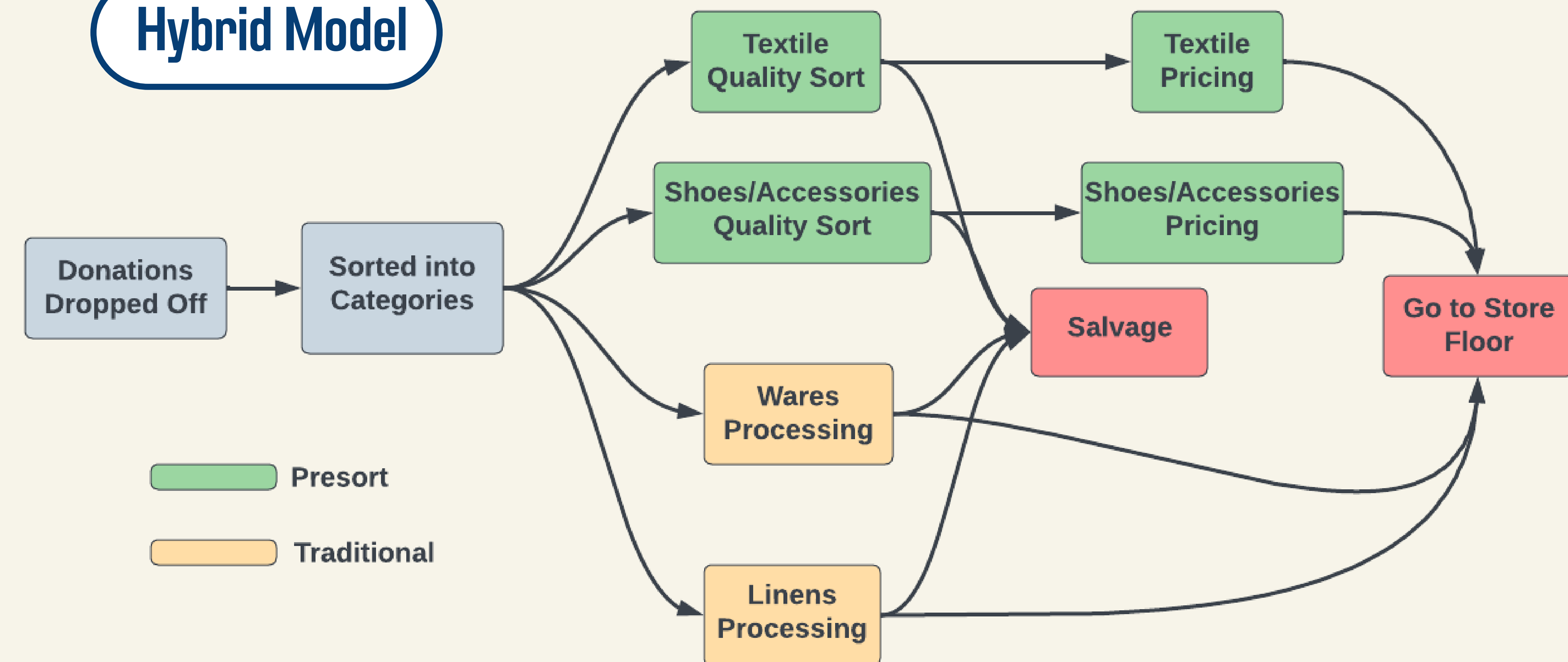


Warehouse



Outlet

## Hybrid Model



## Data

### Collection - Time Studies

- Presort - South Everett
- Traditional - Shoreline
- 3 iterations at each station
- 20 minute observations
- Stations observed: Textiles, Shoes/Accessories, Wares, Linens
- Recorded:
  - # Salvaged
  - # Priced/moving forward
  - General notes about employee activity

### Data Cleaning

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

## Results

Through Simio analysis, switching to hybrid leads to:

↑ 4.7%    ↑ 1.1%    |    ↑ 28.6%    ↑ 52.9%

Linen Production

Wares Production

Textile Production

Shoes/Acc Production

From presort

From traditional

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

## 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

### Current Models

Traditional Method

Presort Method

Apply Most Efficient Features To

### Proposed Model

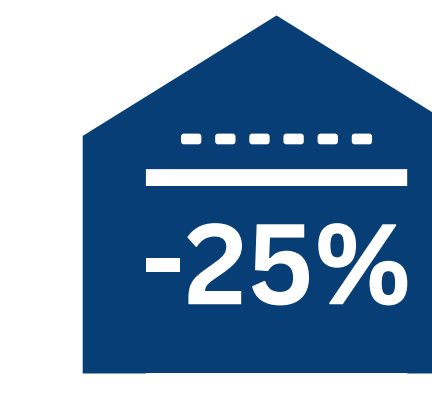
Hybrid Method

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

## Impact



Transportation Costs



Storage Space

- Less time spent in warehouse
- Higher visibility of inventory

## 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