Seattle Goodwill Capstone

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**Introduction**
Seattle Goodwill’s e-commerce has been expanding rapidly and they are expecting an annual growth of around 20-30% in this sector. With this, our project question is: How do we create a facility design that optimizes the effectiveness of their e-commerce sector?

**Current Layout and Proposed Alternatives**

### Current Layout
The Spaghetti map below showcases the process flow for the auctions sectors of Seattle Goodwill. Current pathways taken by the goods are longer than necessary and non-intuitive.

### Proposed Layout
To improve upon this our team developed two alternatives, accounting for all the customer requirements and the growth and expansion considerations.

**Customer Requirements**
The primary requirements for this project include creating a streamlined facility for Seattle Goodwill’s e-commerce operations, improving their existing processes and creating a flexible design that allows room for expansion and future improvements.

**Ethics & Considerations**
Environmental: what makes a facility desirable and worthwhile working in, tailoring it to employee desires?
Social: how do we build a facility that models after Goodwill’s mission and values?
Economic: how do we minimize cost while maximizing operational efficiency?

**Employee Survey**
To best tailor our customer and facility requirements to those working, we sent out a survey that received 38 responses.

**Projections**
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**Cost Benefit Analysis**
In order to determine the economically optimal number of stations for each process, the team utilized a series of excel sheets, like the one below, to document numerous simulations at varying numbers of stations. The excel then uses a variety of costs to determine which number of stations generates the most amount of profit relative to the other trials.

**Time Study**
Each time study was taken with an hour or more of event data. We then compared these data points to the averages we were provided, which was accurate. However, to create a more accurate model, we used our data set to create the following distributions using Statfit for our processes:

- Sorting: Distribution Closed. Distribution shape = Normal, mu = 2.12, sigma = 0.06
- Listing: Distribution Closed. Distribution shape = Normal, mu = 2.12, sigma = 0.06
- Shipping: Distribution Closed. Distribution shape = Uniform (0.025, 0.05)

**Results**
The results of the chosen process layout with the CAD drawn floorplan are shown in the indices of performance. With the process focus layout and line balancing, the is a significant increase in items that are processed per month. The adjacency score is now increased, so the flow of items will be more intuitive. Plus, the ability to expand is present with the new building have a buy-out space until needed.

**Simulations**
The total throughput for all products was 91,278. After validating and verifying these processes were accurate to the existing physical facility, we then created Product and Process layouts, combining all three processes into one.

**Impacts**
We believe that our findings and our proposed layout will significantly impact Seattle Goodwill’s e-commerce operations. As a result of our findings, they will be able to:

- **Cost effective**
- **Meet Growth Projections**
- **Uphold ethical standards and employee satisfaction**
- **Streamline Processes**

**Recommendations**
Some employee recommendations: better tables and equipment, cross training, kaizen events, more 120V outlets, better relations with stores for looking out for ecommerce items, and better process for employees to buy items.