### Parts Reorganization

#### Pick Rack Distribution

- **Small Parts**: 4 Parts, 1 Bin
- **Medium Parts**: 2 Parts, 1 Bin
- **Large Parts**: 1 Part, 1 Bin

#### Bin Labeling System

- **Identifier 1**: Part size type
  - Small (S), Medium (M), Large (L)
- **Identifier 2**: Column in rack A-D (left to right)
- **Identifier 3**: Bin height location 01-12 (bottom to top)
- **Identifier 4**: Bin sub location A-D (front to back)

**Part Location Example**: 501 - A - 01 - A

**Location Identifiers meaning:**
- Identifier 1: Part size type
- Identifier 2: Column in rack A-D (left to right)
- Identifier 3: Bin height location 01-12 (bottom to top)
- Identifier 4: Bin sub location A-D (front to back)

### Optimized Detailed Process Map

#### Receiving Process

- **Shipping Truck Arrives**
- **Cart Unloaded & Sorted**
- **Parts Sorted into Carts**
- **Worker Scans Parts into Cart**
- **Print Labels (Extra if needed)**
- **Move Parts from Cart to assigned Loading Bays**
- **Store Parts**

#### Shipping Process

- **Order Extracted**
- **Print Out of System**
- **Find Correct Pick Rack**
- **Walk to Shelves & Pick Correct Parts**
- **Find Correct Packaging Material**
- **Order, Seal & FedEx Box**
- **Print Shipping Label**
- **Put Labels in Proper Location**
- **Place Order**

### Pick Rack Analysis

- **Rack Size**: 36 x 12 x 75”
- **Bin Size**: 8.5 x 12 x 4”

<table>
<thead>
<tr>
<th>Part Sizes in Carousel</th>
<th>30%</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Bin Size**: 8.5 x 12 x 4”

- **Racks**: 26
- **Total Cost**: $9,218

### New Facility Layout

- **Replacing Carousel with 32 Pick Racks**
- **Moving shipping tables from north wall to east wall**
- **Moving receiving tables from east wall to south wall**
- **Added in extra printer**
- **Moved FedEx and UPS carts away from roll up door**

### Expected Results

<table>
<thead>
<tr>
<th>Current State</th>
<th>Proposed Solution</th>
<th>Expected Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carousel Footprint: 520 Sq. Ft.</td>
<td>Pick Rack Footprint: 96 Sq. Ft.</td>
<td>424 Sq. Ft. of Warehouse Space saved</td>
</tr>
<tr>
<td>Incoming parts storage process: 4.0123 mins</td>
<td>Optimized incoming parts storage process: 2.7998 mins</td>
<td>1.3 minutes saved in turnaround time</td>
</tr>
<tr>
<td>Outgoing parts shipment process: 4.9699 mins</td>
<td>Optimized outgoing parts storage process: 3.2635 mins</td>
<td>1.7 minutes saved in turnaround time</td>
</tr>
<tr>
<td>Incoming parts storage labor costs: $1.20/min</td>
<td>Optimized incoming parts storage labor costs: $0.84/min</td>
<td>Saves $0.36/min in labor costs and $44,928/yr</td>
</tr>
<tr>
<td>Outgoing parts storage labor costs: $1.49/min</td>
<td>Optimized outgoing parts storage labor costs: $0.98/min</td>
<td>Saves $0.51/min in labor costs and $63,648/yr</td>
</tr>
</tbody>
</table>

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**Project Mentor**: Dr. Ertunga Ozelkan

**Project Supporter**: Philipp Reich

**Project Team Members**:
- Maddison Dunton
  - mdunton1@uncc.edu
- Abdulrahman Alissa
  - aalissal@uncc.edu
- Alexander Perrotti
  - aperrotti@uncc.edu
- Aaron Armstrong
  - aarmst37@uncc.edu
- Muhammad Bazuhayr
  - mbazuhay@uncc.edu
- Qublan Alotaibi
  - qalotaib@uncc.edu
- Estevan Torres
  - etorres8@uncc.edu

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**Warehouse Material Workflow Optimization**

Senior Design II – May 2, 2019

The WILMINGTON LEE COLLEGE of ENGINEERING