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Turnaround time reduction for military certificates of compliance - team 1

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Abstract: The objective of this project is to reduce the turnaround time for military Certificates of Compliance (COC) at the Milliken Company in Marietta, S.C. The first step was to determine the needs of the clients and determine the major losses of the system by performing a physical and Why-Why analysis as well as utilizing fishbone diagrams. With this information it was possible to then construct a Pareto chart to show the clients where the large percentage of losses is coming from. The team found that the key losses in the system came from having to send material to an outside lab for testing and that lab technicians allowed large losses when machines were allowed to sit idle for extended periods of time. Using this data the team will generate a set of solutions to tackle the scheduling issues that will optimize the dry-lab testing procedures.

Introduction:

- Key business goals
  - Increase individual dry-lab technician productivity by 10%
  - Reduce lead-time for completed COC’s by 20%
- Performed task analysis to help identify losses in current system
- Worked with both dry-lab technicians and managers
- Identified all losses that occur within the dry-lab
- Performed a root cause analysis and generated Pareto chart
- Concepts generated to address each of the losses
- Very important to keep both space and budget in mind when generating concepts

Methods:

- Identified Key Business Goals
- Developed list of needs from user interviews
- Developed list of metrics based on needs statements
- Identified system losses
- Performed root cause analysis of all losses
- Generated and evaluated initial concepts
- Refined concepts using concept selection matrix
- Performed Failure Modes and Effects Analysis to further refine concept
- Developed recommendations and implementation plan

Results:

The team conducted a Root Cause Analysis and found 15 areas of loss in the current system. The areas of loss, their frequency, and magnitude is shown in the chart below.

<table>
<thead>
<tr>
<th>Phenomenon</th>
<th>Frequency</th>
<th>Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame Test</td>
<td>3</td>
<td>30%</td>
</tr>
<tr>
<td>UCC Test</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Flame Test</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Washer/dryer</td>
<td>6</td>
<td>5%</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>4</td>
<td>4%</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>6</td>
<td>1%</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>7</td>
<td>1%</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>8</td>
<td>1%</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>9</td>
<td>1%</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>10</td>
<td>1%</td>
</tr>
</tbody>
</table>

By creating a Pareto chart it was discovered that the Flame test being performed in Spartanburg, the inputting of the COC data twice, and the clothes dryer account for 80% of the losses.

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Conclusions:

- Root Cause Analysis Conclusions
  - Flame Test material transportation highest magnitude of time lost
  - Washer/dryer idle time major source of time lost
- Preliminary Concept Generation Conclusions
  - Concept 1 presents most promising results at lowest cost
    - Reduces time lost by 365 minutes per day
    - Feasible cost of $65.75
    - Satisfies all key business goals

Acknowledgements:

Our client Gordon Cannon and dry-lab manager Barry Wood and our professor Dr. Scott J. Mason

References