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Turnaround time reduction for military certificates of compliance - team 2

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Abstract: The student members of this senior design project worked specifically with Milliken & Company’s Enterprise plant in Marietta, SC. The Enterprise plant is a finishing plant, therefore it receives previously manufactured textiles from other Milliken plants, applies dyes and finishing chemicals, tests the products, issues a Certificate of Compliance (COC) and ships the product to the customer. The scope of this project includes optimizing the workflow of Military products through the dry testing lab in order to reduce turnaround time of COC’s by at least 25%. The team began by modeling the current system for better understanding. The team then analyzed the losses of the current system and performed the appropriate root cause analyses. The next step in the project is to generate concepts and test them against each other in order to identify the optimal concept. The final step is to implement said concept.

Introduction:

• Milliken & Company
  • Large private textile company
  • Enterprise Finishing Plant applies dyes to textiles and the majority of products are military based

• Key Business Goals:
  • Reduce all military Certificate of Compliance (COC) turnaround times by 25%.
  • Create a detailed, function system to track the status and cycle times of all products and activities in the testing lab, as well as cycle times by employee

Methods:

- Studied Current System
- Created a Mission Statement and Key Business Goals
- Determined Customer Needs
- Created Product Specifications
- Identified System Losses and Root Causes of Losses
- Generated and evaluated initial concepts

Product Specifications:

<table>
<thead>
<tr>
<th>Metric No.</th>
<th>Description</th>
<th>Score</th>
<th>Evaluated by</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>The system is organized.</td>
<td>3.5</td>
<td>Subj</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Layout satisfaction</td>
<td>3</td>
<td>Subj</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Time required to access current status of Military COC’s</td>
<td>3.5</td>
<td>Minutes</td>
<td>&lt;=5</td>
</tr>
<tr>
<td>15</td>
<td>System Visibility</td>
<td>3.5</td>
<td>Subj</td>
<td></td>
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<tr>
<td>23</td>
<td>Additional yearly maintenance cost</td>
<td>4</td>
<td>$</td>
<td>&lt;=1000</td>
</tr>
<tr>
<td>20</td>
<td>Employee Utilization</td>
<td>3.5</td>
<td>%</td>
<td>&lt;=95</td>
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<td>17</td>
<td>The system can run independent of management employees.</td>
<td>3</td>
<td>Binary</td>
<td>Yes</td>
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<tr>
<td>12</td>
<td>The system is run by a self-directed team.</td>
<td>3.5</td>
<td>Binary</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>The system records employee productivity</td>
<td>4.5</td>
<td>Binary</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>High volume products have a standardized test order</td>
<td>4</td>
<td>Subj</td>
<td>&gt;=4</td>
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<td>1</td>
<td>Turn around time for Military COC’s</td>
<td>5</td>
<td>Days</td>
<td>14</td>
</tr>
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</table>

Root Cause Analysis

- Initial Concepts
  1. Implement system using tablets that track all orders in progress
  2. Tablet computers for testing data entry instead of folders
  3. Implement existing Milliken scheduling systems (from Pendleton benchmark)
  4. Create and implement new scheduling system for the Enterprise Dry Lab
  5. Implement Cross-Training structure
  6. Make Cross-Training visible
  7. Beeping timer for the washer
  8. Increase durability of cutting dies
  9. Establish testing compatibility lists (Ex. lists of which fabrics can be tested together)
  10. Record cycle times for tests by individual employee
  11. Track equipment utilization
  12. Have a non-lab employee perform the header delivery
  13. Obtain new cutting press surface that does not wear out dies
  14. Obtain sharpening equipment for the Enterprise plant to maintain cutting dies themselves
  15. Create visual display of work in progress
  16. Optimize lab layout
  17. Establish standardized rush order procedure
  18. Desktop computers for testing data entry instead of folders
  19. Implement SS in the testing lab
  20. Add capacity for over-utilized testing processes

Conclusions: After the team had spent significant time and effort understanding the current state of the system, analyzing key losses of the current system, and conducting a root cause analysis, the team moved forward with concept generation. Through methods of internal brainstorming, external brainstorming, interviews with the client, interviews with key business personnel, and benchmarking, the team generated 20 initial concepts. After the initial analyses and evaluation of the concepts, the team plans to move forward with combining, refining, and conducting a more extensive evaluation of scoring the concepts based on the project metrics and product specifications. The team will then recommend their final solution to the client and move forward with implementation.

Acknowledgements:

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