Applying Lean Six Sigma at Nordson EFD

Getting Back to the Customer

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Getting Back to the Customer

- EFD had been distracted by:
  - Moving to a new Factory
  - Recession of 2008

- Moved focus towards Lean Six Sigma
  - Organize the new factory
  - Keep up with returned demands after the recession

- Realization they lost focus of the customer
On-Time Delivery

- The way to “get back to the customer”
- Based of the scheduling of production:
  - Must keep up with demand
  - Demand can not exceed capacity
- Problems were being caused by:
  - Increased demand
  - Outsources products
  - Quality Checks
Addressing the Problems

- The problems were really just trade-offs
  - Increased Demand $\rightarrow$ good thing
  - Outsourced Products $\rightarrow$ result of increased demand
  - Quality Checks $\rightarrow$ necessary to guarantee quality
Addressing the Problems

- Decided to focus on the “little things” around the factory to be fixed
- Results by 2012:

![On-Time Delivery Rates Chart]

- Jan. 2010: 56%
- Nov. 2010: 76%
- Dec. 2011: 90%
- Oct. 2012: 92%
Next Step

• Missed goal of 95% by the end of 2012 by 3%

• Need to Focus on Kanban system
  ◦ Plastics Department
  ◦ Electromechanical Department

• Addressed using DMAIC methodology
Define

- **Plastics:**
  - Not producing the proper number of units for the packaging department

- **Electromechanical**
  - Unable to keep up with demand
Measure – Plastics

<table>
<thead>
<tr>
<th>Department</th>
<th>Finished goods</th>
<th>Packaging</th>
<th>Molding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand Created</td>
<td>Send out Orders</td>
<td>Fill the Purchase Order</td>
<td>Replace Material for Packaging</td>
</tr>
<tr>
<td>Activity to satisfy Demand</td>
<td>Activates a Purchase Order to Package more</td>
<td>Uses up all Material</td>
<td>Molding Process Started</td>
</tr>
</tbody>
</table>

*Signal triggered*
Analyze - Plastics

- Kanban cards were not asking for the proper number of units needed
  - This happened when there was an increase in demand (60% of the demand is special orders from China)
- Ripple effect: molding would deplete their raw material supplies
- Unique Aspects: Production is able to quickly adapt to a problem or shortage
Improve – Plastics

• Solutions:

1) Create a reorder point for the products and a max point instead of using the current Kanban card system

2) Designate all of China’s orders to be make-to-order

3) Use an electronic Kanban system that automatically adjust the level needed for a specific order
Improve - Plastics

- Best Solution: Implement an electric Kanban system
  - Allows the Kanban system to be as versatile as the department’s operation
  - Expensive up front cost that will pay off over time by making production more efficient
Control – Plastics

- Conduct a cost-benefit analysis to determine the proper reach of the system
- Make sure the Electronic Kanban system is working efficiently and effectively
  - Set acceptable high and low defect levels
  - Determine an acceptable delay length
  - Monitor results closely and attend to any issues that may arise
# Measure – Electromechanical

<table>
<thead>
<tr>
<th>Demand Created</th>
<th>Department</th>
<th>Finished goods</th>
<th>Electromechanical Assembly</th>
<th>Purchased Parts</th>
<th>Machining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand Created</td>
<td>Activity to satisfy Demand Created</td>
<td>Sell Valve or Dispenser</td>
<td>Supervisor approves Purchas Order and sends to work cell to make</td>
<td>Replace Supplies</td>
<td>OR</td>
</tr>
<tr>
<td>Activity to satisfy Demand Created</td>
<td>Activates a Purchase Order</td>
<td>Uses up supplies from purchased parts or Machining</td>
<td>Sent to Component Super Market</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Analyze – Electromechanical

- Shortage of parts for electromechanical assembly demand
  - Purchased Parts department had to wait for their supplier to deliver the part
  - Machining department was designed for a different level of demand

- Unique Aspect: Production is very complex and has long lead times
Improve – Electromechanical

• Solutions for Purchased Parts:
  1) Have a safety stock of components by ordering more components than demanded
  2) Set up multiple suppliers for different components. The purchased parts department will have a second option of which supplier they would like to buy from.

• Solutions for the Machining department:
  1) Add more machines.
  2) Add more labor and run more shifts
Improve – Electromechanical

- **Purchased Parts**
  - Best Solution: Set up multiple suppliers
    - It will take time to find new suppliers
    - Will have to conduct quality checks of new supplier
    - EFD will now have the power to ensure delivery will be made on time and will no long hold up their production

- **Machining**
  - Best Solution: Purchase a new machine
    - Allow the department to keep up with demand
    - Little reorganization cost because department was expected to expand when the new building was set up
Control – Electromechanical

- **Purchased Parts:**
  - Compare past delivery rates, prices, and quality with the new suppliers

- **Machining:**
  - Supervisors must set maximum and minimum levels of output for the department and ensure they reach those numbers
Conclusion

- Changes will allow each department to keep up with demand
- Allow factory to adapt their capacity to their new level of demand
- Each department is now able to operate as effectively and efficiently as possible
Any Questions?