Case Study: How Carolina Cabinet Company Improved Productivity by 240%

Merwan Mehta, Ph.D., CSSBB, CMfgE
Associate Professor
College of Technology & Computer Science
EAST CAROLINA UNIVERSITY
Learning Objectives

1. Elements of a process
2. Converting a process into a value stream
3. Elements of value streams
4. Lean Six-sigma principles for value streams
5. Balancing activities; activity efficiency (AE)
6. Applying AE to primed & unprimed processes
7. Simulation to learn principles of AE
8. Case study – Carolina Cabinet Company, NC
Problems with a Typical Process (Transactional)

- Organized as functional depts.
- Work travels multiple depts.
- Employees responsible for dept. function only
  - Long lead-times & large queues of WIP
  - Lengthy problem resolution cycles
  - Handoffs create mistakes and loss of information
  - Checkpoints are needed to identify mistakes

Source: Hyer & Wemmerlov, Reorganizing the Factory: Competing through Cellular Manufacturing

http://www.aplcresearch.com/Batonn%20passing.jpg
Process to Value Streams

- A value stream has multiple activities
- A value stream converts inputs into outputs, continuously
- Consists only of value-added activities!
Elements of Value Streams

1. Activities and activity time for each output
2. Inputs and outputs
3. Start time and end time
4. Lead time
5. %VAT
6. Takt time for output to final customer
7. Cycle times for activities
Activity Efficiency for a Process

• Use activity efficiency (AE) to make “every minute of every employee” count

• Use AE to evaluate:
  ➢ How well activities in a process are balanced
  ➢ How well employees are working together to eliminate waste in the process
We use color to brighten your day!
Super Safe Airplanes, Inc.

Our planes keep you safe by not becoming airborne!
# Rolled Throughput Yield

<table>
<thead>
<tr>
<th>Activity Stations</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Formulae</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Outputs completed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>Outputs completed</td>
</tr>
<tr>
<td>B Outputs waiting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>Outputs waiting</td>
</tr>
<tr>
<td>C Outputs unsatisfactory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>Outputs unsatisfactory</td>
</tr>
<tr>
<td>D Outputs processed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>Outputs processed</td>
</tr>
<tr>
<td>E Outputs satisfactory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>Outputs satisfactory</td>
</tr>
<tr>
<td>F FPY (Ratio)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FPY (Ratio)</td>
</tr>
<tr>
<td>G %RTY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>%RTY</td>
</tr>
</tbody>
</table>

Data input | Calculated item | Product of all FPY's
Carolina Cabinet Company
Carolina Cabinet Company