Smart Packaging for Sustainability and Savings

Tom Blanck, CSCP, CPP
Principal
CHAINalytics
Tom Blanck, CSCP, CPP leads the Packaging Optimization Practice at Chainalytics as Principal where he manages the delivery of supply chain packaging optimization and complex package engineering services as well as packaging value improvement programs. Working with leading organizations, Tom has enabled packaging improvement across multiple industries, including CPG, Manufacturing, Medical, and Technology. In addition, Blanck is a certified instructor for Dale Carnegie Training.
It’s not just about the packaging...  
...it’s a supply chain win!
Introduction

• Packaging has become a strategic issue.
• Packaging design can benefit the supply chain.
• Packaging affects costs and sustainability.
Session Agenda

- The Linkage Between Sustainability and Savings
- Packaging’s Impact on the Supply Chain
- Packaging Optimization Examples
- Packaging Improvement Opportunity Checklist
Session Agenda

The Linkage Between Sustainability and Savings

Packaging’s Impact on the Supply Chain

Packaging Optimization Examples

Packaging Improvement Opportunity Checklist
The Truth About Sustainability

**Myth**
- It’s a Bad Thing
- It’s for Tree Huggers
- Costs More Money
- Must be “Green”
  - Compostable
  - Biodegradable
  - Recycled

**Reality**
- Makes Business Sense
- Provides Long-Term Benefits
  - Financial Benefits
  - Environmental Benefits

*Sustainability with Savings*

Achieving Sustainable Productivity
meeting customer demand in an unpredictable world

[APICS - The Association for Operations Management®]
What is the environmental impact of packaging?

- Natural Resource Consumption
- Greenhouse Gas Emission
Practical Steps to Minimize the Environmental Impact of Packaging

• To Reduce Material Consumption (Fiber):
  – Reduce or Eliminate Materials
  – Substitute Packaging Materials

• To Reduce Greenhouse Gases (Diesel, Energy):
  – Reduce Weight
  – Increase Shipping Densities
Practical Steps to Minimize the Environmental Impact of Packaging

• Focal Points for Packaging Improvement Opportunities:
  – Packaging Materials
  – Packaging Volume
Practical Steps to Minimize the Environmental Impact of Packaging

Reduce Material

- Reduced Expenses
- Less Material in Waste Stream
- Fewer Disposal Challenges
- Reduced Weight
- Cube Utilization

Examples
- Right-weighting Packaging Materials
- Shared Load Packaging Strategies
- Minimize Internal Packaging
- Proper Amounts of Cushioning
Practical Steps to Minimize the Environmental Impact of Packaging

Reduce Volume

- Decreased Freight Costs
- Decreased Small Parcel Ship Costs
- Increased Throughput
- Storage, Warehouse Savings
- Handling, Labor Savings

Examples
- Eliminate Headspace and Voids
- Minimize Case Dimensions
- Pallet Unit Load Optimization
- Primary Packaging Size
Strategic Approach to Packaging

- Material Costs
- Handling Costs
- Warehousing Costs
- Labor Costs
- Freight Costs
Strategic Approach to Packaging

• Logistics costs far outweigh material costs.
• Practical packaging improvement tactics should be strategically applied and coordinated across the supply chain.
10 Reasons Why Packaging Has Become Strategic

1. Affects All Stakeholders in the Supply Chain
   - Manufacturing
   - Operations
   - Transportation

2. Logistic Costs Continue to Escalate
   - Fuel Prices

3. Larger Cost Centers within Company
10 Reasons Why Packaging Has Become Strategic

4. Changing Sales Channels
   - New Customer Destinations with Different Shipping Formats

5. Changing Transportation Modes
   - Packaging Requirements Vary for Truck, Intermodal, Air
10 Reasons Why Packaging Has Become Strategic

6. Supply Chain Stakeholders Want Sustainability
   – Material and Energy Usage Effects All Parts

7. Changing Customer Requirements
   – Material Substitution (PVC)
   – Product Amounts or Sizes (Single Serve)
10 Reasons Why Packaging Has Become Strategic

8. Margin Preservation
   – Reduced Cost of Delivery

9. Customers Paying More Attention

10. Supply Chain Benefits Enable a Strategic Win and Competitive Advantage
Session Agenda

The Linkage Between Sustainability and Savings

Packaging’s Impact on the Supply Chain

Packaging Optimization Examples

Packaging Improvement Opportunity Checklist
Packaging’s Impact on the Supply Chain

Supplier → Manufacturing → Storage Warehouse → Distribution Center → Retail Store → Customer
Supplier → Manufacturing → Storage Warehouse → Distribution Center → Retail Store → Customer
Supplier → Manufacturing → Storage Warehouse → Distribution Center → Retail Store → Customer
Supplier → Manufacturing → Storage Warehouse → Distribution Center → Retail Store → Customer

LTL

Small Parcel
Packaging’s Impact on Manufacturing

- Inbound Materials
- Packaging Line Efficiencies
- Labor Reduction
- Material Costs
Packaging’s Impact on Warehouse and Distribution Center Operations

- Footprint
- Stacking
- Handling
- Labor
- Damage
Packaging’s Impact on Transportation

• **Cube Utilization**
  – More Product per Trailer or Container
  – Eliminate Voids

• **Reduced Weight**
  – Minimized Materials, Waste
Packaging’s Impact on Transportation

• More Product per Trailer Means Fewer Trailers
  – Reduced Freight Costs
  – Reduced Emissions
  – Reduced Cost per Product
Session Agenda

The Linkage Between Sustainability and Savings

Packaging’s Impact on the Supply Chain

Packaging Optimization Examples

Packaging Improvement Opportunity Checklist
Example 1: Yogurt

**Objective**

- Increase Sustainability, Improve Walmart Scorecard
Example 1: Yogurt

**SOLUTION**

• Improve Raw Material Sourcing Efficiency
Example 1: Yogurt

**Solution**

**Preformed Cup (PF)**
- 7.3g of Plastic
- Cups Created Offsite
- Circular Shape (Less Efficient)
- Cups Shipped to Plant
- Individual Sales Units

**Form, Fill & Seal (FFS)**
- 5g of Plastic (31% Lighter)
- Cups “Stamped” at Yogurt Plant
- Cube Shape (More Efficient)
- Multi-Pack Format
- Reduces Labor Costs at Stores and DCs
Example 1: Yogurt

**SOLUTION**

**Preformed Cup (PF)**

**Form, Fill & Seal (FFS)**

- 200,000 More Cups per Pallet
- 3,000 Fewer Pallets
- 82 Fewer Trucks
Example 1: Yogurt

**SOLUTION**

- 39% More Product per Pallet
  - Trailers “Weight Out” vs. “Cube Out”
  - 15,000 Fewer Pallets

- Reduced 17 MM ft²+ Corrugated Materials
  - Less Corrugate: **50%** More Product per Case
  - Lid Weight = **50%** Less

- 1,900 Tons Packaging Weight Reduction
  - **34%** Savings

Source: Walmart Internal Research; www.edf.org
Example 1: Yogurt

**Solution**

- Estimated 8,400,000 Fewer Case Touches
  - ¼ Fewer Touches in Store (Retail Readiness)
  - Over $3MM Savings per Year at WMDC*

- Saved Over 14,000 Gallons of Diesel

- Projected 22,000,000 BTU’s of Energy Savings
  - Equivalent to 242 Homes per Year!**

Source: *Walmart Internal Research; **www.edf.org
Example 1: Yogurt

**RESULTS: INBOUND MATERIALS**

<table>
<thead>
<tr>
<th><strong>BUSINESS RESULTS</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Package Material Savings</td>
<td>31%</td>
</tr>
<tr>
<td>Freight Savings</td>
<td>60%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SUSTAINABILITY RESULTS</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging Weight Reduction</td>
<td>363 Tons</td>
</tr>
<tr>
<td>Pallets Eliminated</td>
<td>3,000</td>
</tr>
<tr>
<td>CO₂ Reduction</td>
<td>32 Tons</td>
</tr>
</tbody>
</table>

Achieving Sustainable Productivity
meeting customer demand in an unpredictable world
Example 1: Yogurt

RESULTS: OUTBOUND PRODUCTS

<table>
<thead>
<tr>
<th>BUSINESS RESULTS</th>
<th>SUSTAINABILITY RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Savings</td>
<td>Weight Reduction</td>
</tr>
<tr>
<td>&gt; 30%</td>
<td>1,900 tons</td>
</tr>
<tr>
<td>Freight Savings</td>
<td>Pallets Eliminated</td>
</tr>
<tr>
<td>28%</td>
<td>&gt; 15,000</td>
</tr>
<tr>
<td>Corrugated Savings</td>
<td>CO₂ Reduction</td>
</tr>
<tr>
<td>33%</td>
<td>&gt; 2,000 tons</td>
</tr>
<tr>
<td>Pallet Savings</td>
<td>Energy Reduction</td>
</tr>
<tr>
<td>$90,000</td>
<td>22 MM BTU</td>
</tr>
</tbody>
</table>
Example 2: Medical Device

**OBJECTIVE**

- Decrease Transit Damage
- Identify Improvement Opportunities
Example 2: Medical Device

**Solution**

- **Tray Re-Design with Paired Products**

<table>
<thead>
<tr>
<th></th>
<th>Old Tray</th>
<th>New Tray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>11.15</td>
<td>9.41</td>
</tr>
<tr>
<td>Width</td>
<td>7.625</td>
<td>7.44</td>
</tr>
<tr>
<td>Height</td>
<td>2.625</td>
<td>2.625</td>
</tr>
<tr>
<td>Cube</td>
<td>223</td>
<td>184</td>
</tr>
</tbody>
</table>

*Reduction* 18%
Example 2: Medical Device

**Solution**

- **14% More Units per Pallet**
- **9% Corrugated Reduction**

**Old Configuration (700)**

**New Configuration (800)**
Example 2: Medical Device

**RESULTS** *(FOR EACH MILLION UNITS)*

<table>
<thead>
<tr>
<th>BUSINESS RESULTS</th>
<th>SUSTAINABILITY RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Savings: $86,000</td>
<td>Paper Reduction: 66,000 ft²</td>
</tr>
<tr>
<td>Freight Savings: $14,000</td>
<td>Pallets Eliminated: 420</td>
</tr>
<tr>
<td>Labor, Warehouse, &amp; Handling Savings:</td>
<td>Tray Material Savings: 18%</td>
</tr>
<tr>
<td>Sterilization Savings: 14%</td>
<td>Lid Material Savings: 15%</td>
</tr>
</tbody>
</table>

---

**THE BOTTOM LINE**

$108,000 Costs Saved  
6 Tons Fiber Reduced  
270 Tons CO₂ Eliminated
Example 3: Meat Products

**OBJECTIVE**

- Reduce Packaging Damage During Transit
- Decrease Supply Chain Costs
Example 3: Meat Products

**Solution**

- Reduce Case Size
- Optimize for Cubic Densities and Transit Efficiencies
- Utilize Shared-Load Concepts
- Improve Stacking Performance
Example 3: Meat Products

**SOLUTION**

60% More Cases per Pallet
Example 3: Meat Products

### RESULTS

#### BUSINESS RESULTS

<table>
<thead>
<tr>
<th>Category</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Savings</td>
<td>$125,000</td>
</tr>
<tr>
<td>Labor Savings</td>
<td>$5,000</td>
</tr>
<tr>
<td>Warehouse Savings</td>
<td>$86,000</td>
</tr>
<tr>
<td>Pallet Savings</td>
<td>$19,000</td>
</tr>
</tbody>
</table>

#### SUSTAINABILITY RESULTS

<table>
<thead>
<tr>
<th>Category</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-Flute Reduction</td>
<td>3,165,305 ft²</td>
</tr>
<tr>
<td>Pallet Reduction</td>
<td>4,400</td>
</tr>
</tbody>
</table>

### THE BOTTOM LINE

- **$235,000** Costs Saved
- **164 Tons** Fiber Reduced
Example 4: Clear Plastic Wrap

**OBJECTIVE**

Optimize Product Dimensions to Reduce Material Consumption
Example 4: Clear Plastic Wrap

**Solution**

- Space Saving Carton Reduction ~ 16%
- Core Size Reduction ~ 23%
- Corrugated Reduction ~ 18%
- New Unit Load Configurations ~ 30%

![Clear Plastic Wrap](image)

<table>
<thead>
<tr>
<th>1.625”</th>
<th>1.25”</th>
</tr>
</thead>
</table>

*Source: APICS, The Association for Operations Management*
Example 4: Clear Plastic Wrap

**Solution**

- **PRODUCT 1 (30)**
- **PRODUCT 2 (39)**

- **30% More Cartons per Pallet**
- **18% Corrugated Reduction**
## Example 4: Clear Plastic Wrap

### RESULTS (FOR EACH 10 MILLION UNITS)

#### BUSINESS RESULTS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Savings</td>
<td>$300,000</td>
</tr>
<tr>
<td>Freight Savings</td>
<td>$75,000</td>
</tr>
<tr>
<td>Labor, Warehouse, &amp; Handling Savings</td>
<td>$40,000</td>
</tr>
</tbody>
</table>

#### SUSTAINABILITY RESULTS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper Reduction</td>
<td>2,559,524 ft²</td>
</tr>
<tr>
<td>Pallet Reduction</td>
<td>2,200</td>
</tr>
</tbody>
</table>

### THE BOTTOM LINE

- **$415,000** Costs Saved
- **33 Tons** Fiber Reduced
- **1,400 Tons** CO₂ Eliminated

---

*Achieving Sustainable Productivity: meeting customer demand in an unpredictable world*
Session Agenda

- The Linkage Between Sustainability and Savings
- Packaging’s Impact on the Supply Chain
- Packaging Optimization Examples
- Packaging Optimization Checklist
What to Look For When Identifying Improvement Opportunities

☑ Inefficient Use of Space
  - In the Package
  - In the Case or Shipper Unit
  - In the Trailer or Shipping Container

☑ Excessive Packaging Materials
  - Multiple Packages
  - Duplicated Containers or Cases
What to Look For When Identifying Improvement Opportunities

☑️ Improper Pallet Usage
  - Underhang or Overhang
  - Open Space on Deck Boards
  - Odd Stacking Configurations, Chimneys

☑️ Packaging or Product Damage
  - Crushed Corners, Leaning Stacks, Unsaleables
What to Look For When Identifying Improvement Opportunities

- **Voids in Trailers and Containers**
  - Open Floor Space
  - Open Space Above Payload

- **Warehouse Inefficiencies**
  - Inefficient Use of Racking Systems
  - Multiple Pallet Handlings
  - Break Down and Rebuild of Pallets
  - Repack and Packaging Waste
Session Agenda

The Linkage Between Sustainability and Savings

Packaging’s Impact on the Supply Chain

Packaging Optimization Examples

Packaging Improvement Opportunity Checklist
Strategic Approach to Packaging

- Material Costs
- Handling Costs
- Warehousing Costs
- Labor Costs
- Freight Costs
Executing Packaging Optimization Strategies Requires Expertise

• Packaging Design
  – New Packaging Specifications Required

• Packaging Testing
  – Determine Optimal Amounts or Types of Packaging
  – Distribution Specific
  – No “on the road” tests!
Summary

- Packaging has become a strategic issue.
- Packaging design can benefit the supply chain.
- Packaging affects costs and sustainability.
Thank you!

Tom Blanck, CSCP, CPP
tblanck@chainalytics.com
o) 651.236.4911
m) 612.812.3372