TECHNOLOGY ADVANCES IN MATERIAL HANDLING

Sponsored by:

Presented by:

Alan M. Marder, The Raymond Corp., Director-Technology Solutions

Dean Dorcas, Easy Metrics, CEO

Bob Simon, Genco, Director, Process Solutions
WAREHOUSE OPTIMIZATION SYSTEMS

Data acquisition that drives warehouse efficiency
WAREHOUSE OPTIMIZATION

Make process improvements
Increase productivity
Create a safer workplace
Provide management with business intelligence
Instill driver accountability
Realize labor savings

Programs such as fleet management systems address these opportunities, and more…

ProMat 2018
DID YOU KNOW?

72% of all forklift operating expenses are NOT related to truck price or general maintenance costs

Customers demand information to:
- Improve productivity
- Increase operational efficiency
- Reduce costs
- Maximize asset utilization
- Instill accountability
- Reduce impacts/damage
- Reduce liability and risk

Pyramid diagram showing the breakdown of forklift operating expenses:
- Labor: 72%
- Purchase price: 11%
- Maintenance: 9%
- Electricity: 5%
- Interest: 3%
MOBILE DATA PLATFORMS

Voice-directed Work

Truck Data Capture

Barcode Data Collection

Fixed-mount Computers

Battery Monitoring

Vehicle Management Systems
# FLEET OPTIMIZATION – Core Features

## OSHA CHECKLISTS
- Electronic vs. Paper Checklists
- Paperless/Automated Record Management
- Wireless Maintenance Alerts
- Automatic Vehicle Lockout

## IMPACT MONITORING
- Multiple Impact Level Settings
- Wireless Impacts Alerts/Recording by Driver
- Damage Expense Avoidance

## PRODUCTIVITY
- Increase Operator Efficiency
- Optimize Vehicle Utilization & Mix

## ACCESS CONTROL
- Operator Certification & Authorization
- Enforcement & Lockout
- Automated Asset Tracking
LMS TODAY

» A review of current Labor Management System solutions
KEY COMPONENTS OF LABOR MANAGEMENT

» Cost to serve visibility
  » Where are my labor $ being spent?
  » What is my cost per unit by process, customer or category?
  » How am I tracking compared to my volume adjusted budget?

» Employee Accountability
  » Recognize top performers and take action with underperformers daily.
  » Fair labor standards are critical.

» Pay-for-Performance
  » Share part of the savings with employees for hitting stretch goals.
  » Should be based on individual or small team performance.
Key Challenges

- Productivity should be tracked at the individual level
- Single metric standards (units/hr) vary too much to be effective
- Timely reporting is needed to make effective management decisions

Spreadsheets are flexible but have significant limitations

- Hard to track performance over a period of time
- Complex models can break easily

Traditional Labor Management Systems

- Powerful tools but can be expensive to implement and maintain
  - Software integration
  - Development and maintenance of Engineered Labor Standards
  - Mapping warehouse locations to calculate travel distance
SOLUTION: Fleet Management + Labor Management

» Fleet management systems collect real-time data from the vehicle
  » Travel distances, utilization rates, impact monitoring, checklist automation

» Labor management systems integrate vehicle and employee activities
  » Daily data feed from the fleet management system, WMS, spreadsheets and time clock

» Two Options
  » Lite version for facilities without scanned data
  » Full version combines the data from a fleet management system with WMS data

» Benefits
  » Travel metrics without the cost of XYZ modeling
  » Accountability and rewards based on fair and accurate metrics
VEHICLE LABOR COST BY ACTIVITY

Data collected through fleet management systems, combined with labor data, provide the ability to determine **cost per case by vehicle type**. Management can direct supervisors to place drivers on the most cost effective equipment for the task being performed.
**Employee Scorecard**

**Date:** July 30, 2012  
**Employee:** Curlew, Paula (443)

<table>
<thead>
<tr>
<th>Item</th>
<th>Last Period</th>
<th>90 Days</th>
<th>YTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELS</td>
<td>123.99 %</td>
<td>124.66 %</td>
<td>120.25 %</td>
</tr>
<tr>
<td>ELS Rank</td>
<td>14 of 37</td>
<td>13 of 50</td>
<td>16 of 61</td>
</tr>
<tr>
<td>QLS</td>
<td>100.00 %</td>
<td>100.00 %</td>
<td>100.00 %</td>
</tr>
<tr>
<td>QLS Rank</td>
<td>1 of 37</td>
<td>1 of 50</td>
<td>1 of 61</td>
</tr>
<tr>
<td>Direct Hours</td>
<td>67.74</td>
<td>426.75</td>
<td>1,047.28</td>
</tr>
<tr>
<td>Indirect Hours</td>
<td>1.83</td>
<td>12.94</td>
<td>12.94</td>
</tr>
<tr>
<td>Indirect %</td>
<td>2.64 %</td>
<td>2.95 %</td>
<td>2.64 %</td>
</tr>
<tr>
<td>Indirect Rank</td>
<td>17 of 37</td>
<td>28 of 50</td>
<td>24 of 61</td>
</tr>
<tr>
<td>Work Days in Period</td>
<td>9</td>
<td>63</td>
<td>147</td>
</tr>
<tr>
<td>Bonus Earned</td>
<td>$ 191.91</td>
<td>$ 1,102.65</td>
<td>$ 2,405.03</td>
</tr>
<tr>
<td>Bonus Rank</td>
<td>5 of 37</td>
<td>8 of 50</td>
<td>8 of 61</td>
</tr>
<tr>
<td>Evaluation Score</td>
<td>4.25</td>
<td>4.25</td>
<td>4.25</td>
</tr>
<tr>
<td>Eval. Score Rank</td>
<td>1 of 37</td>
<td>1 of 50</td>
<td>1 of 61</td>
</tr>
<tr>
<td>Missing Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing Time Rank</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Top 5 Processes by ELS (90 days):**
  - Bulk Pick – Shoes: 153.45%
  - Shipping: 96.9%
  - Forward Pick – Apparel: 82.5%
  - Forward Pick – Shoes: 78.3%
  - Bulk Pick – Apparel: 75.2%

- **Employee Productivity vs. Facility Productivity (90 days):**
  - Facility: Blue Line
  - Employee: Red Line

- **Employee Evaluation Scores:**
  - Attitude: 4.00 (90 day Score), 4.00 (YTD Score)
  - Teamwork: 5.00 (90 day Score), 5.00 (YTD Score)
  - Safety: 4.00 (90 day Score), 4.00 (YTD Score)
  - Attendance: 4.00 (90 day Score), 4.00 (YTD Score)
  - Average: 4.25 (90 day Score), 4.25 (YTD Score)
CASE STUDY – GENCO

» Second largest third-party logistics in North America, with more than 130 facilities
» Has an internal labor management consulting group with extensive experience in this area
» They identified a fleet management system and a labor management system as a powerful combination
» Fully implemented the combined system at the first facility
» Combining lift truck data, WMS data, time clock data and manual tracking sheets

Today…

A combination of fleet management and labor management systems are now proposed as the solution for Genco current and new potential 3PL customers.
How these systems work together

- Vehicle data is exported from the fleet management system to the labor management system.
- Also can be integrated with WMS and time clock data.
- Result is a complete picture of operator and vehicle activity.
- Rewards can be based on fair and accurate metrics.
- Warehouse productivity increases and costs are reduced.
RESULT OF IMPACT TRACKING IS AN 80% REDUCTION IN IMPACTS

Moderate and Medium Level Impact Trend, by Month
Genco Xerox March 1 - August 31, 2012

Managers can monitor facility impact trending.

80% reduction in moderate & medium impacts resulting in lower cost of product, MHE and rack damage.

Managers can also monitor monthly spikes in impacts and adjust processes or retrain drivers accordingly.
Order picker 401 reallocated to another facility. $25K+ cost avoidance (MHE, battery, maintenance, electricity, cost of capital etc.)
TRAVEL WITH LOAD UTILIZATION

The red arrow tracks the month-to-month improvement in travel with load (TWL) as a percentage of motion time (the amount of time the vehicle is traveling or lifting).

This metric measures the amount of time a vehicle is actually moving product.

7.9% increase (from 58.3% to 62.9%) in TWL since the fleet management system was implemented.
## COST BREAKDOWN BY PROCESS

**Facility:** Sample Customer  
**Date Range:** 07/19/2011 to 07/19/2011

<table>
<thead>
<tr>
<th>Department</th>
<th>Process</th>
<th>Client</th>
<th>Unit Name</th>
<th>Units / Hr</th>
<th>Units Processed</th>
<th>Total Hours</th>
<th>Unit Cost (unburdened)</th>
<th>Unit Cost (90 Day)</th>
<th>Total Cost</th>
<th>Productivity Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly</td>
<td>Assembly-Label/Ticket</td>
<td>Williams Sonoma Catalog</td>
<td>Eaches</td>
<td>44.57</td>
<td>156</td>
<td>3.5</td>
<td>$0.272</td>
<td>$0.127</td>
<td>$42</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assembly-Rework</td>
<td></td>
<td>Eaches</td>
<td>56.56</td>
<td>207</td>
<td>3.7</td>
<td>$0.185</td>
<td>$0.076</td>
<td>$34</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Macy's Home Store</td>
<td>Eaches</td>
<td>122.93</td>
<td>1,260</td>
<td>10.2</td>
<td>$0.090</td>
<td>$0.090</td>
<td>$121</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assembly-w/Poly Bag-Label</td>
<td></td>
<td>Units</td>
<td>244.80</td>
<td>4,886</td>
<td>20.0</td>
<td>$0.031</td>
<td>$0.023</td>
<td>$150</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sets/Clip Strips</td>
<td></td>
<td>Sets</td>
<td>117.80</td>
<td>1,176</td>
<td>10.0</td>
<td>$0.064</td>
<td>$0.136</td>
<td>$75</td>
<td></td>
</tr>
<tr>
<td>Forklift</td>
<td>Full Case Pick - NonWalmart</td>
<td></td>
<td>Locations</td>
<td>106.04</td>
<td>5,514</td>
<td>52.0</td>
<td>$0.168</td>
<td>$0.200</td>
<td>$924</td>
<td>141.6 %</td>
</tr>
<tr>
<td></td>
<td>Full Case Replenishment</td>
<td></td>
<td>Full Pallets</td>
<td>20.78</td>
<td>112</td>
<td>5.4</td>
<td>$0.930</td>
<td>$1.051</td>
<td>$104</td>
<td>152.2 %</td>
</tr>
<tr>
<td></td>
<td>Putaway</td>
<td></td>
<td>Pallets</td>
<td>25.65</td>
<td>159</td>
<td>6.2</td>
<td>$0.765</td>
<td>$0.759</td>
<td>$122</td>
<td>132.0 %</td>
</tr>
<tr>
<td>Other Areas</td>
<td>Cycle Count</td>
<td>Locations</td>
<td>Locations</td>
<td>39.22</td>
<td>60</td>
<td>1.5</td>
<td>$0.512</td>
<td>$0.514</td>
<td>$31</td>
<td>112.2 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indirect- Cardboard</td>
<td>0.5</td>
<td></td>
<td></td>
<td>$0.08</td>
<td>$0.72</td>
<td>$8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indirect- Cleaning</td>
<td>5.7</td>
<td></td>
<td></td>
<td>$0.042</td>
<td>$0.72</td>
<td>$8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indirect- Inventory</td>
<td>0.6</td>
<td></td>
<td></td>
<td>$0.05</td>
<td>$0.08</td>
<td>$8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indirect OA</td>
<td>1.0</td>
<td></td>
<td></td>
<td>$0.034</td>
<td>$0.08</td>
<td>$16</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Misc</td>
<td>2.8</td>
<td></td>
<td></td>
<td>$0.04</td>
<td>$0.08</td>
<td>$8</td>
<td></td>
</tr>
<tr>
<td>Pick &amp; Pack</td>
<td>Packing/No Audit</td>
<td></td>
<td>Units</td>
<td>308.27</td>
<td>5,142</td>
<td>16.7</td>
<td>$0.042</td>
<td>$0.082</td>
<td>$216</td>
<td>116.0 %</td>
</tr>
<tr>
<td></td>
<td>Picking - Non-Macy</td>
<td></td>
<td>Units</td>
<td>67.39</td>
<td>1,176</td>
<td>17.4</td>
<td>$0.183</td>
<td>$0.118</td>
<td>$215</td>
<td>58.5 %</td>
</tr>
<tr>
<td>Replenishment</td>
<td>Split Case Replenishment</td>
<td></td>
<td>Lines</td>
<td>17.46</td>
<td>88</td>
<td>5.0</td>
<td>$0.569</td>
<td>$0.626</td>
<td>$76</td>
<td>90.1 %</td>
</tr>
<tr>
<td>Unloading</td>
<td>Unload Containers</td>
<td></td>
<td>Cases</td>
<td>550.13</td>
<td>8,252</td>
<td>16.0</td>
<td>$0.034</td>
<td>$0.041</td>
<td>$277</td>
<td>123.2 %</td>
</tr>
<tr>
<td>Missing Time</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td>$0.01</td>
<td>$0.01</td>
<td>$3</td>
<td></td>
</tr>
<tr>
<td><strong>Total Tracked Labor Cost</strong></td>
<td></td>
<td></td>
<td>Regular Hours</td>
<td>177</td>
<td></td>
<td></td>
<td>$2,544</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overtime Hours</td>
<td>0</td>
<td></td>
<td></td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process Name</td>
<td>Code</td>
<td>Metric 1 Qty</td>
<td>Metric 2 Qty</td>
<td>Metric 3 Qty</td>
<td>Hours</td>
<td>ELS %</td>
<td>Complete %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>----------</td>
<td>--------------</td>
<td>--------------</td>
<td>--------------</td>
<td>-------</td>
<td>--------</td>
<td>------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Armstrong, Rodney</td>
<td>D001-TRODNEYA</td>
<td>Qty 558.0</td>
<td>Locations 4.0</td>
<td>Scans 4.0</td>
<td>0.48</td>
<td>41.8%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consolidation</td>
<td>D001-TRODNEYA</td>
<td>Qty 248.0</td>
<td>Locations 32.0</td>
<td>Scans 32.0</td>
<td>0.09</td>
<td>61.4%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward Pick - Apparel</td>
<td>D001-TRODNEYA</td>
<td>Qty 1273.0</td>
<td>Locations 17.0</td>
<td>Scans 19.0</td>
<td>0.94</td>
<td>117.9%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replenishment - Apparel</td>
<td>D001-TRODNEYA</td>
<td>Qty 1776.0</td>
<td>Locations 106.0</td>
<td>Scans 108.0</td>
<td>5.16</td>
<td>102.7%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bates, Cathie</td>
<td>D001-TRODNEYA</td>
<td>Qty 321.0</td>
<td>Locations 154.0</td>
<td>Scans 174.0</td>
<td>2.31</td>
<td>120.1%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shipping</td>
<td>D001-TRODNEYA</td>
<td>Qty 4403.0</td>
<td>Locations 486.0</td>
<td>Scans 3179.0</td>
<td>4.94</td>
<td>134.0%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolting, Daniel</td>
<td>D001-TRODNEYA</td>
<td>Qty 80.0</td>
<td>Orders 57.0</td>
<td>Scans 77.0</td>
<td>2.91</td>
<td>157.0%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Entry - Returns</td>
<td>D001-TRODNEYA</td>
<td>Qty 140.0</td>
<td>Lines 64.0</td>
<td>RA's 1.0</td>
<td>4.75</td>
<td>28.7%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing Up - Apparel</td>
<td>D001-TRODNEYA</td>
<td>Qty 140.0</td>
<td>Locations 106.0</td>
<td>Scans 108.0</td>
<td>5.16</td>
<td>102.7%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Any number of KPI can be tracked using a fleet management system. Supervisors receive a daily report that ranks drivers by their achievement of TWL as a percentage of login time. Those drivers who achieve highest scores are recognized; those who need coaching are encouraged to adopt the best practices of their peers.

<table>
<thead>
<tr>
<th>First Login</th>
<th>Last Logoff</th>
<th>Login Hrs</th>
<th>Activity Hrs</th>
<th>Deadman Hrs</th>
<th>Travel Hrs</th>
<th>TWL Hrs</th>
<th>TRVL %</th>
<th>TWL %</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/04 07:09</td>
<td>09/04 11:57</td>
<td>4.3</td>
<td>2.5</td>
<td>3.0</td>
<td>2.5</td>
<td>2.5</td>
<td>67.0%</td>
<td>56.7%</td>
</tr>
<tr>
<td>09/04 07:00</td>
<td>09/04 14:59</td>
<td>7.1</td>
<td>4.0</td>
<td>0.0</td>
<td>4.0</td>
<td>3.0</td>
<td>57.0%</td>
<td>41.6%</td>
</tr>
<tr>
<td>09/04 07:00</td>
<td>09/04 13:59</td>
<td>4.6</td>
<td>3.1</td>
<td>3.1</td>
<td>3.1</td>
<td>1.9</td>
<td>67.0%</td>
<td>40.8%</td>
</tr>
<tr>
<td>09/04 08:04</td>
<td>09/04 14:44</td>
<td>4.5</td>
<td>2.6</td>
<td>3.2</td>
<td>2.6</td>
<td>1.6</td>
<td>57.0%</td>
<td>34.9%</td>
</tr>
<tr>
<td>09/04 08:00</td>
<td>09/04 15:00</td>
<td>6.2</td>
<td>2.4</td>
<td>3.2</td>
<td>2.9</td>
<td>2.1</td>
<td>57.0%</td>
<td>33.4%</td>
</tr>
<tr>
<td>09/04 07:00</td>
<td>09/04 14:59</td>
<td>7.2</td>
<td>4.5</td>
<td>6.3</td>
<td>4.4</td>
<td>2.3</td>
<td>62.0%</td>
<td>32.7%</td>
</tr>
</tbody>
</table>

**1.9 hours standing on deadman**

**2.1 hours empty travel**

**4 hours of opportunity**
Incentive takes ramp-up period into account

Multiple metrics such as quality and performance impact incentive payout
ANALYSIS OF CASE PICKING VEHICLE USAGE

Case-picking vehicle activity was 33.39% of all vehicle activity for the period April 1 through April 26, 2012. In-depth view of activity by vehicle type provides insight into best practices to manage labor and vehicle assignments to maximize profitability.

Over 60% of cases picked using most expensive & less productive MHE
COMBINED PRODUCTIVITY IMPROVEMENT

Introduction of engineered standards and incentive

Percent of ELS Standard Achieved

Travel with Load as % of Motion Time

Mar-12 | Apr-12 | May-12 | Jun-12 | Jul-12 | Aug-12 | Sep-12

60% | 65% | 70% | 75% | 80% | 85% | 90% | 95%

64% | 63% | 62% | 61% | 60% | 59% | 58% | 57% | 56%
The ability to graph productivity trends was requested by the Xerox.

Now, this is part of the standard product.
BENEFITS TO YOUR WAREHOUSE

- Cutting-edge business intelligence functionality
- True metrics based on operator and vehicle activity
- A complete solution to managing equipment usage, plus…
- An employee reward solution for productivity improvement
- Can optimize fleet for warehouse task requirements

Fleet Management + Labor Management
COMBINED RESULTS

» Increased productivity
» Reduced labor costs
» Reduced impacts
» Increased net savings
» Decreased indirect costs
Thank you for attending. For more information, please contact:

Speaker: alan.marder@raymondcorp.com
Home Page: www.raymondcorp.com

Visit ProMat 2013 Booth 3219