Trends in Supply Chain Management

Maciek Nowak, PhD
Logistics (or supply chain management) is …

“… that part of the supply chain process that plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers’ requirements.”

Council of Supply Chain Management Professionals

OR

“… the management of inventory at rest or in motion.”

Mercer Management Consulting, Inc.
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## US Business Logistics Costs

$ in billions

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>% change from 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Business Inventory</td>
<td>2,064</td>
<td>2,269</td>
<td>2,459</td>
<td>2,496</td>
<td></td>
</tr>
<tr>
<td>Interest</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Taxes, Obsolescence, Depreciation, Insurance</td>
<td>294</td>
<td>302</td>
<td>330</td>
<td>331</td>
<td></td>
</tr>
<tr>
<td>Warehousing</td>
<td>120</td>
<td>130</td>
<td>137</td>
<td>143</td>
<td></td>
</tr>
</tbody>
</table>

### Carrying Costs

<table>
<thead>
<tr>
<th>Carrying Costs</th>
<th>418</th>
<th>434</th>
<th>469</th>
<th>476</th>
<th>1.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck - Local</td>
<td>198</td>
<td>202</td>
<td>204</td>
<td>216</td>
<td>1.5%</td>
</tr>
<tr>
<td>Truck - Intercity</td>
<td>431</td>
<td>445</td>
<td>453</td>
<td>486</td>
<td>6.7%</td>
</tr>
<tr>
<td>Motor Carriers</td>
<td>629</td>
<td>647</td>
<td>657</td>
<td>702</td>
<td>7.3%</td>
</tr>
<tr>
<td>Railroads</td>
<td>68</td>
<td>72</td>
<td>74</td>
<td>80</td>
<td>5.7%</td>
</tr>
<tr>
<td>Water</td>
<td>32</td>
<td>35</td>
<td>37</td>
<td>40</td>
<td>6.3%</td>
</tr>
<tr>
<td>Oil pipelines</td>
<td>10</td>
<td>13</td>
<td>13</td>
<td>17</td>
<td>30.8%</td>
</tr>
<tr>
<td>Air</td>
<td>32</td>
<td>33</td>
<td>33</td>
<td>28</td>
<td>2.0%</td>
</tr>
<tr>
<td>Forwarders</td>
<td>35</td>
<td>37</td>
<td>38</td>
<td>40</td>
<td>5.4%</td>
</tr>
<tr>
<td>Other Carriers</td>
<td>177</td>
<td>189</td>
<td>195</td>
<td>205</td>
<td>3.2%</td>
</tr>
<tr>
<td>Shipper Related Costs</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Transportation Costs

<table>
<thead>
<tr>
<th>Transportation Costs</th>
<th>816</th>
<th>846</th>
<th>862</th>
<th>907</th>
<th>5.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics Administration</td>
<td>49</td>
<td>51</td>
<td>53</td>
<td>56</td>
<td></td>
</tr>
</tbody>
</table>

### Total logistics cost

| Total logistics cost | 1,282| 1,331| 1,385| 1,449| 4.6% |
Logistics Costs as Part of GDP

Source: Rosalyn Wilson, State of the Logistics Union report, 2015
What are supply chain managers most concerned with?

- Global supply chains
  - What is the impact of manufacturing thousands of miles from your customers?
  - Is manufacturing coming home?
  - How about those emerging markets?
Shifting Demographics

- China’s middle class could double by 2020
- Today, 450 million Indians have middle class incomes
- In Brazil, 30 million have moved to the middle class
- Huge population growth through 2050 will occur in developing nations
Manaus: lemonade out of lemons

• 3 million people living in the heart of the Amazon
What are supply chain managers most concerned with?

• Big data
  – What drives every supply chain?
  – How do you utilize all of the information you’re collecting?
Simulation methods

- Evaluating expectations through repetitive testing
- Scenario planning for risk and change management
Forecasting techniques

- Predictive snapshot of operations
- Driving the entire supply chain
Network Optimization

- Determining the best solution for your network
- Evaluating problems that only years ago were unsolvable

*Algorithm Will Tell All UPS Trucks Where to Go*

UPS's Orion platform has been designed to optimize deliveries with the best, and most consistent routes. *By Jenn Gidman*
Information Visualization

- Analysis – Understand your data better and act upon that understanding
- Presentation – Communicate and inform others more effectively
What are supply chain managers most concerned with?

- Collaboration / Supplier Relationship Management
  - More than just sharing of information
What are supply chain managers most concerned with?

• Risk
  – Lack of visibility in supply chain
  – How secure is your supply chain?
  – Are you prepared for various plausible scenarios?
What are supply chain managers most concerned with?

• Volatility of energy costs
  – When costs go up, speed goes down
• Sustainability
  – Can you (or your customer) report on the environmental impact of your process?
• Aging infrastructure
Congestion 1998
Projected Congestion 2040

Peak-Period Congestion on the National Highway System: 2040

Note: Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95. The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual, Appendix N.

Freight Train Late? Blame Chicago
By JOHN SCHWARTZ

CHICAGO — When it comes to rail traffic, Chicago is America’s speed bump.

Shippers complain that a load of freight can make its way from Los Angeles to Chicago in 48 hours, then take 30 hours to travel across the city. A recent trainload of sulfur took some 27 hours to pass through Chicago — an average speed of 1.13 miles per hour, or about a quarter the pace of many electric wheelchairs.

With freight volume in the United States expected to grow by more than 80 percent in the next 20 years, delays are projected to only get worse.

The underlying reasons for this sprawling traffic jam are complex, involving history, economics and a nation’s disinclination to improve its roads, bridges, and rails.

Six of the nation’s seven biggest railroads pass through the city, a testament to Chicago’s economic might when the rail lines were laid from the 1800s on. Today, a quarter of all rail traffic in the nation touches Chicago. Nearly half of what is known as intermodal rail traffic, the big steel boxes that can be carried aboard ships, trains or trucks, roll by, or through, this city.
Effective Supply Chain Leaders…

- Applying certainty to uncertain situations affecting others, such as in forecasting or decision making
- Balancing risk and reward in careful analysis using hard and soft skills
- Aligning tactics to strategy in planning and harmony with organizational culture
- Maintaining and improving relationships of supply chain partners
- Satisfying competing priorities and stakeholders on an ongoing basis