Global Supply Chain Management

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IML EPFL

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1/ Golden Words in Supply Chain Management
Are we sure to share the same definitions?

Supply Chain in 12 words

The golden words

- Services (customers satisfaction)
- Customers (back office, front office)
- Physical Flow
- Logistics tools (DCs, trucks, containers…)
- Costs (inventory, order processing, handling, transportation,…)
- IT tools (ERP, WMS,…)
- Process (forecasting, planning,…)
- Inventory management
- Control of performance: Benchmarking, Metrics, KPI’s

Supply Chain is a producer of services to the Customers :
on time delivery, availability, reliability, quality…
Supply Chain Definitions

- The purpose of the SC is:
  - To understand and convert into solutions the customer expectations related to services
  - To make sure that the right resources are available all along the supply chain from suppliers to end user customers delivering the goods at the right time in the right location
- SC is a full cross function process, addressing global end to end processes.
- SC is focused on Customer Satisfaction and assets management (working capital and buildings).

Logistic offer definition

- It is a part of a company Offer
- It is composed of standard terms and conditions under which the company is willing to deliver products to its customers; it's described in four domains of order management:
  - before sales: data management and communication (lead time to customers, catalogue (paper, electronics, configuration tools, etc...) and tariffs)
  - administrative order processing
  - physical order processing, including transport to customers
  - after sales: management of returns and complaints
- It exists at two levels:
  - Standard processes to order, deliver and return products
  - Additional added value services: labeling, kiting, vendor management inventory...
2/ Stakes and first definitions

The original paradox

- Supply chain seems very simple by the observation of the elementary facts: handling, moving
  - each of us do that in our private life

- What makes supply chain difficult is the mix between:
  - the combination of the number of
    - SKU's
    - points of delivery
    - plants
  - the pressure on the delivery lead time reliability
  - the pressure on the financial cost (obsolescence, level of service)
  - the broader range of services proposed to the customers (logistic offer)
The scope of the supply chain process

This is the process of planning, implementing and controlling the efficient, cost effective flow and storage of raw materials, in-process inventory, finished goods, and related information from point of origin to point of consumption, for the purpose of conforming to customer requirements.

(Council of Supply Chain Management for professionals - USA)

The components of the supply chain process
Actors of the Supply Chain

SUPPLY CHAIN Manager

SUPPLY PLANNING Manager

DEMAND PLANNING Manager

LOGISTICS Manager

PRODUCTION

SUPPLIERS

R&D

SALES Network & Marketing

Supply chain: 3 levels of involvement

- DESIGN
- MONITORING
- EXECUTION

Supplier
Distributor
Consumer / Shopper

Supplier of the supplier
Producer
Customer
Key missions attached to the Supply Chain

- To optimise the interface Supply/Demand according to the « trade-off »
  customer service / cost :

  **Trade-Off**

  - **EXPECTED CUSTOMER SERVICE**
  - on time delivery
  - availability facing the demand
  - customer service specification differentiated by customer segment

  - **MINIMIZATION OF THE SUPPLY CHAIN COST**
  - inventory holding cost
  - costs of the supply chain operations (production, transportation, warehousing, post-manufacturing operations,...)
  - information systems

Modeling the trade-off service vs cost in supply chain

- Significant increase of the quality of service without increasing the logistics costs
- Organization based on PF focused on the flows related to scope 1
- Organization based on PF focused on the flows related to scope 2

- Current organization
- **Quality of service**
- Logistics costs / Income
- 40% 50% 60% 70% 80% 90% 100%
### Benchmarking: Michelin case

<table>
<thead>
<tr>
<th></th>
<th>0–20% Major opportunity</th>
<th>20–40% Disadvantage</th>
<th>0–20% Average</th>
<th>0–20% Best in Class</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer Satisfaction Performance(%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery date required by customer</td>
<td>65%</td>
<td>79</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td><strong>Delivery performance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery Lead Time (in days, OTD)</td>
<td>11.8</td>
<td></td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td><strong>Production flexibility (in days)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Supply Chain Cost in % of turnover</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stock immobilization</td>
<td>Stock coverage (in days)</td>
<td></td>
<td>73.2</td>
<td>44.2</td>
</tr>
</tbody>
</table>

#### Components of the Strategic Environment: the Demand Side

**Supply Side**
- Delocation
- Production specialization
- SC processes
- Late differentiation

**Demand Side**
- Take over of the supply chains by retailers
- Segmentation of customers requirements
- Fragmentation of the value chains
- Outsourcing of the logistics operations
**Downstream: Multi-scale Distribution Network**

**Rexel Case in France: historical situation**

**Step 1: Historical Scenario**

- Leader in the distribution of electrical materials
  - about 8 billions euros in the world
  - result of the merging of two national distributors
- 35 regional companies in France
  - several organizations
  - autonomous (purchasing, supplying, marketing, HR...)
  - IS very different
- 450 stores in France
A summary of the historical physical chain (Rexel)

80,000 SKUs (overall offer of the suppliers)

120,000 SKUs into the catalog

8,000 SKUs into the stores

Suppliers

Outlets

Case 1

Case 2

Case 3

The DC implementation ("the Rexel delivery plant"…)

Step 1

Step 2

Historical scenario

Target scenario

- Prepare the order
- Direct delivery
- Supplying the outlets
- Consolidation of the deliveries from the suppliers
- Improvement of the quality of services
  - SKU XYZ sold twice per year in each outlet for a given region
  - If each region has about 40 outlets, the SKU is sold 80 times. It is possible to store it
Design of the targeted scenario (Rexel)

- Global Distribution Centre
  - slow-moving SKUs
  - speculative inventory
  - national range of products
- Regional Distribution Centres
  - 10,000m² and 25,000m²

The roll out (Rexel)

Step 1
Historical scenario

Step 2
Target scenario

Step 3
Rolled out scenario

Inventories
A solution which provided the expected outcome

Sales (€ M / % growth)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales</th>
<th>% Growth</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>6,658</td>
<td>6,805</td>
<td>7,377</td>
</tr>
<tr>
<td></td>
<td>+2.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+8.4%</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Working capital (€ M / % of sales)

<table>
<thead>
<tr>
<th>Year</th>
<th>Working Capital</th>
<th>% Change</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>17,3%</td>
<td>15,2%</td>
<td>13.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,103</td>
<td>1,027</td>
<td>1,039</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

ROI (+ % growth)

<table>
<thead>
<tr>
<th>Year</th>
<th>ROI</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Customer service improvement

Objective: Order up to 6:00 pm day D = delivery before 1:00 pm day D+1

Receiving (DC)
97% of received goods available the same day

Stock take (DC)
2 to 3 checks per year for fast movers
1 check per year for the others

Picking (DC)
99.89% OK
1.5 errors per 1,000 order lines

Shipping (ex DC)
99.50% received orders before 19.00 shipped same day

Delivery
98% received orders before 6:00 pm day D = delivery day D+1 before noon

Delivery day D+1 before noon

98% received orders
before 6:00 pm day D =
delivery day D+1 before noon

98% received orders
before 6:00 pm day D =
delivery day D+1 before noon
**Benefits**

<table>
<thead>
<tr>
<th>Expected</th>
<th>Obtained</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Property</td>
<td></td>
</tr>
<tr>
<td>- Branches = - 250,000 m²</td>
<td></td>
</tr>
<tr>
<td>- Distribution centres = + 160,000 m²</td>
<td></td>
</tr>
<tr>
<td>Potential surface reduction: 90,000 m²</td>
<td></td>
</tr>
<tr>
<td>- Hard to achieve</td>
<td></td>
</tr>
<tr>
<td>- Branches well located: m² kept</td>
<td></td>
</tr>
<tr>
<td>- Branches moved: m² more expensive</td>
<td></td>
</tr>
<tr>
<td>- Branches with empty m²</td>
<td></td>
</tr>
<tr>
<td>- Bundling of replenishment: additional logistics discounts from suppliers</td>
<td></td>
</tr>
<tr>
<td>- Objective = 3% additional discount</td>
<td></td>
</tr>
<tr>
<td>- Achieved = 1%</td>
<td></td>
</tr>
<tr>
<td>- Centralisation of commercial back office</td>
<td></td>
</tr>
<tr>
<td>- Productivity gains = 600 jobs (supplier and product files management, replenishment, transport, …)</td>
<td></td>
</tr>
<tr>
<td>- New skills required</td>
<td></td>
</tr>
<tr>
<td>- Receiving: * 26 %</td>
<td></td>
</tr>
<tr>
<td>- Picking: * 21 %</td>
<td></td>
</tr>
<tr>
<td>- Distribution centres productivity</td>
<td></td>
</tr>
<tr>
<td>- Stocks</td>
<td></td>
</tr>
<tr>
<td>- 35% reduction of stock level</td>
<td></td>
</tr>
<tr>
<td>- Reduction of obsolescence</td>
<td></td>
</tr>
<tr>
<td>- Stocks 2005 = 11,3 % of the turnover</td>
<td></td>
</tr>
<tr>
<td>- Sales increase</td>
<td></td>
</tr>
<tr>
<td>- Branch sales forces more focus on selling, take advantage of a more reliable customer service</td>
<td></td>
</tr>
</tbody>
</table>

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**Benchmarking: Quality of Service**

<table>
<thead>
<tr>
<th>Criteria assessment by customers</th>
<th>CRITERIA</th>
<th>Competitors and company position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less important</td>
<td>Important</td>
<td>Very important</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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26
Tyre industry case: Logistics Customer Segmentation in the replacement business

PARTNERS

KEY ACCOUNTS
holding inventories

Fast moving items

Big volumes, delivered weekly

A

B

C

Fast moving items with emergency orders

Small volumes, delivered within 24h

Slow moving items, emergency orders

Small volumes, delivered within 24h to 72h

Slow moving items

Volumes low delivery frequency >= 72h

SMALL ACCOUNTS
without holding inventories

Medium volumes, delivered within 72h

Components of the Strategic Environment: the Supply Side

Supply Side

- Delocation
- Production specialization
- SC processes
- Late differentiation

Demand Side

- Take over of the supply chains by retailers
- Segmentation of customers requirements

- Fragmentation of the value chains
- Outsourcing of the logistics operations
Overseas location: intercontinental flows in lens industry

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>25%</td>
</tr>
<tr>
<td>2000</td>
<td>36%</td>
</tr>
<tr>
<td>2005</td>
<td>43%</td>
</tr>
</tbody>
</table>

Container shipments remain mainly shipments out of South America, Europe, and Asia going North America, Europe and Asia for Saint-Gobain

Container shipping main trades

2010

160 M. USD

13,500

19,000

2,700

2,000

9,300

21,200

Note: (1) Twenty foot Equivalent Unit
Main costs in international Saint-Gobain logistics chains

<table>
<thead>
<tr>
<th>Inland 1€ (1$)/km</th>
<th>sea-freight : 250~2500 $ / TEU</th>
<th>THC ‘POL’ 40~400 $</th>
<th>THC ‘POD’ 40~400 $</th>
</tr>
</thead>
<tbody>
<tr>
<td>300~800 $ / TEU</td>
<td></td>
<td>Port Of Loading</td>
<td>Port Of Destination</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B/L fees, customs clearance, other surcharges 40~200 $</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Management fee 40~75 $</td>
<td></td>
</tr>
</tbody>
</table>

Logistics impact / multi-items factories / specialized factories

Multi-items factories working at local level and producing full range of products (A,B,C,D)

Focused factories producing at international level only one specific item
Key Success factors in Supply Chain (1/2)

- **Time**
  - Strategy of time-based competition
  - Three definitions of time:
    - The production or procurement or Supply Chain lead time
    - The order-to-delivery or order-to-cash cycle (delivery lead-time)
    - Time to market for New Product Introduction

- **Elasticity (=flexibility in volume)**
  - Strategy of make or buy and sizing investments
  - Manufacturing and logistics capacity

- **Quality of service**
  - Strategy of differentiation based on customer service
  - Reliability (demand forecast, production capacity)
  - Availability
Key Success factors in Supply Chain (2/2)

- **Flexibility**
  - Strategy of product variety and diversity (= flexibility in diversity)
  - Location of SC facilities (plants, DCs, hubs) (=flexibility in SC network)

- **Productivity**
  - Strategy of volume
  - Semi-automation
  - Lean manufacturing
  - Lean warehousing

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Supply Chain: Contribution to strategic objectives

- **Service Level & Quality**
  - Customer satisfaction

- **Costs**
  - P&L

- **Stocks**
  - Working Capital

- **Assets Utilization**
  - Saturation/R.O.I/ROCE

- **ECO-FRIENDLY SC**
  - Energy resources
  - CO2 emission
3/ Key components of Supply Chain Planning and Demand Planning

The push model

Push system/MTS

Demand Flow = Forecast

Supplier → Third-party logistics → Retailer → Consumer

Product Flow
The push/pull and pull models

**Demand Flow**

**MTO**

Supplier → Third-party logistics → Retailer → Consumer

**Product Flow**

**BTTO**

Supplier → Third-party logistics → Retailer → Consumer

Timely, accurate, paperless information flow

Smooth, continual product flow matched to consumption

«Bullwhip effect» - «Forester» effect

Replenishment orders

Team 1

Number of orders

Weeks

Factory

Distributor

Wholesaler

Retailer

Wholesaler

Distributor

Factrory
The Forester effect

4/ Logistics of distribution
Key evolutions in retail

Ranking of the big retailers (1/2)

Retailers Top Ten (Turnover in Billion USD)

<table>
<thead>
<tr>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wal-Mart (USA)</td>
<td>1. Wal-Mart (USA)</td>
</tr>
<tr>
<td>2. Carrefour-Promodes (F)</td>
<td>2. Carrefour-Promodes (F)</td>
</tr>
<tr>
<td>3. Home Depot (USA)*</td>
<td>3. Tesco (UK)</td>
</tr>
<tr>
<td>4. Tesco (UK)</td>
<td>4. Metro AG (G)**</td>
</tr>
<tr>
<td>5. Metro AG (G)**</td>
<td>5. Home Depot (USA)*</td>
</tr>
<tr>
<td>6. Kroger (USA)</td>
<td>6. Kroger (USA)</td>
</tr>
<tr>
<td>7. Target (USA)</td>
<td>7. Lidl (G)</td>
</tr>
<tr>
<td>8. Cost’co (USA)</td>
<td>8. Cost’co (US)</td>
</tr>
<tr>
<td>9. Sears (USA)</td>
<td>9. Target (USA)</td>
</tr>
<tr>
<td>10. Lidl (G)</td>
<td>10. Aldi (G)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Turnover (Billion USD)</th>
<th>Turnover (Billion USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>345 (11.1%)</td>
<td>375</td>
</tr>
<tr>
<td>98 (2.3%)</td>
<td>112</td>
</tr>
<tr>
<td>91 (11.5%)</td>
<td>95</td>
</tr>
<tr>
<td>80 (12.5%)</td>
<td>88</td>
</tr>
<tr>
<td>75 (4%)</td>
<td>77</td>
</tr>
<tr>
<td>66 (5.7%)</td>
<td>70</td>
</tr>
<tr>
<td>60 (9.3%)</td>
<td>69</td>
</tr>
<tr>
<td>59 (11.6%)</td>
<td>63</td>
</tr>
<tr>
<td>53 (9%)</td>
<td>63</td>
</tr>
<tr>
<td>52 (12%)</td>
<td>58</td>
</tr>
</tbody>
</table>

( ) Average growth in 2001-2006 period
* Home Depot: DIY
** Metro: Cash & Carry

Source: Deloitte Touche Tohmatsu (2008)
### Ranking of the big retailers (2/2)

#### Retailers Top Ten (Turnover in Billion USD)

<table>
<thead>
<tr>
<th>Year</th>
<th>Rank</th>
<th>Company</th>
<th>Turnover (Billion USD)</th>
<th>Growth %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>1.</td>
<td>Wal-Mart (USA)</td>
<td>401</td>
<td>9.4%</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>Carrefour-Promodes (F)</td>
<td>128</td>
<td>4.3%</td>
</tr>
<tr>
<td></td>
<td>3.</td>
<td>Metro (G)**</td>
<td>99</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>4.</td>
<td>Tesco (UK)</td>
<td>96</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>5.</td>
<td>Lidl Schwarz (G)</td>
<td>80</td>
<td>(12.3%)</td>
</tr>
<tr>
<td></td>
<td>6.</td>
<td>Kroger (USA)</td>
<td>76</td>
<td>7.2%</td>
</tr>
<tr>
<td></td>
<td>7.</td>
<td>Home Depot (USA)*</td>
<td>71</td>
<td>(1.9%)</td>
</tr>
<tr>
<td></td>
<td>8.</td>
<td>Cost’co (USA)</td>
<td>71</td>
<td>(11.2%)</td>
</tr>
<tr>
<td></td>
<td>9.</td>
<td>Aldi (G)</td>
<td>66</td>
<td>6.1%</td>
</tr>
<tr>
<td></td>
<td>10.</td>
<td>Target (USA)</td>
<td>63</td>
<td>6.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Rank</th>
<th>Company</th>
<th>Turnover (Billion USD)</th>
<th>Growth %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>1.</td>
<td>Wal-Mart (USA)</td>
<td>405</td>
<td>7.3%</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>Carrefour-Promodes (F)</td>
<td>120</td>
<td>3.4%</td>
</tr>
<tr>
<td></td>
<td>3.</td>
<td>Metro (G)**</td>
<td>91</td>
<td>3.0%</td>
</tr>
<tr>
<td></td>
<td>4.</td>
<td>Tesco (UK)</td>
<td>91</td>
<td>10.9%</td>
</tr>
<tr>
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<td>5.</td>
<td>Lidl Schwarz (G)</td>
<td>77</td>
<td>(9.9%)</td>
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<td>6.3%</td>
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<tr>
<td></td>
<td>7.</td>
<td>Cost’co (USA)</td>
<td>70</td>
<td>8.2%</td>
</tr>
<tr>
<td></td>
<td>8.</td>
<td>Aldi (G)</td>
<td>68</td>
<td>6.3%</td>
</tr>
<tr>
<td></td>
<td>9.</td>
<td>Home Depot (USA)*</td>
<td>66</td>
<td>(2%)</td>
</tr>
<tr>
<td></td>
<td>10.</td>
<td>Target (USA)</td>
<td>63</td>
<td>6.8%</td>
</tr>
</tbody>
</table>

( ) Average growth in 2003-2008 period for 2008 ranking
( ) Average growth in 2004-2009 period for 2009 ranking
* Home Depot: DIY
** Metro: Cash & Carry

Source: Deloitte Touche Tohmatsu (2008)

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### Change business model in mass retail

Since few years, mass retail has drastically evolved: business model evolution, competitive environment, competences evolution, increasing power of the upstream part of value chain
The Tesco model of the « ready-to-sell »

- Supply Chain and Demand Chain in retailing business
Case-study: Casino

In Casino, goods flows and information flows are embedded within the same department, flow direction. Against its major competitors, Casino logistics is insourced, Easydis.

In Casino, 4,000 suppliers, 300,000 SKUs, 30 warehouses, 10 millions pallets par year, 1,500 trucks per day, 6,000 POS to deliver, 6 billion products to deliver

Case-study: Casino
Strategy of flows optimization (1/3)

Increase the scope of retailers’ action by enlarging its vision from the supplier to the POS

Extended Supply Chain
- Include within the optimization scope supplier’s logistics and POS’s logistics
- Play on transportation, storage and handling to shelf costs (« the last ten meters »)
### Product price breakdown

<table>
<thead>
<tr>
<th></th>
<th>Costs</th>
<th>Inventories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Margin and central costs</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Operations costs</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Logistics</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Shelf</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Other costs and margin</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Only logistics</td>
<td>0.5 Bn€</td>
<td>0.3 Bn€</td>
</tr>
<tr>
<td>Logistics and POS</td>
<td>1 Bn€</td>
<td>1 Bn€</td>
</tr>
<tr>
<td>Extended Supply chain</td>
<td>3 Bn€</td>
<td>1.3 Bn€</td>
</tr>
</tbody>
</table>

### Case-study: Casino

**Strategy of flows optimization (2/3)**

- Out of stock decrease → Increase of REX
- Increase of frequency
- Lead-time reduction
- Optimization all over the chain

**Case-study: Casino**

**Strategy of flows optimization (3/3)**

- Speed up the flows to improve the ROCE
- Improvement of profit (ROCE)
- Inventories reduction → Reduction of fixed assets
Case-study: Casino
A strategy to support the private labels

Why develop private labels?

- Differentiation of the product range offer by getting value from a one century brand name
- To counter balance the bargaining power against the suppliers who are in a concentration process
- To decrease sales prices and increase volumes in order to compete against discount
- To increase profit by working on the whole supply chain

Case-study: Casino
Private labels projects: upstream and downstream loop

**UPSTREAM Loop**
- Ahead inventories / Consolidation Freight Station
- Suppliers dedicated portal

**DOWNSTREAM loop**
- Ready-to-sell
- Excellence of the fulfillment rate
Case-study: Casino
Suppliers portal


- A platform of exchange between Casino and its suppliers
- 24/24, 7/7 access via internet
- 2,200 connections per week
- 800 suppliers using it regularly
- 12 weeks of forecast updated on a daily basis

Case-study: Casino
Optimization of shelf loading (the « last ten meters »)

Objective: Optimize the shelf loading in the POS through a better upstream optimization

Two examples

Ready-to-sell

Predictability of the hours for loading the shelves

- Translate the POS orders into a number of theoretical hours
- Allocate adequate human resources every day and for each POS
- Measure the productivity of the shelf loading for each POS. Benchmark the POS.
A focus on shelf availability: How sophisticated are we in terms of shopper understanding?
Fill rate breakdown from the retailer's perspective

Why fixing OOS (Out Of Stock) is complex? (1)
• Case-study: Yoplait

Problems of Short Shelf Life

“Imposed” Production

“Uncertain” demand

No stock

Pushed flow

Pulled flow

Estimates Planning Organization
Evolution of number of Delivery Points  
(excl. AFH: Away From Home)

Production Specialization
Logistic Organization until 1980

Logistic Organization 1980-84
Logistic Organization 1984-86

Hypermarkets

HM+

Regional Hub

Direct Deliveries

Wholesaler Service Provider

Retailers Warehouse

SM/Convenience stores

Logistic Organization 1986-95

Hypermarkets

HM+

Regional Hub

Direct Deliveries

Wholesaler Service Provider

Retailers Warehouse

SM/Convenience stores
Logistic Organization 1995-

Distribution Flow (1)
Service Quality Challenges

- Level of service (quantity) : 99%
- Level of product line to conform to : 98.5%
- Level of delivery to conform to : 80%
- Level of release: 0.5%
5/ Market of Logistics Service Providers

Main services provided by LSP

- Shipment Consolidation
- Logistics Information Systems
- Product Returns
- Warehouse Management/Operations
- Inventory Management
- Carrier Selection
- Order Fulfillment
- Rate Negotiations
- Order Processing
- Fleet Management/Operations
- Product Assembly
- Customer Spare Parts
- Vendor Selection
- Purchasing
Global logistic costs and contract logistics

- In 2010, the WW logistic market (logistics costs) is evaluated at 7,000 B$, out of 550 B$ are outsourced.

  - Breakdown by geographical zone (2009):

<table>
<thead>
<tr>
<th>Region</th>
<th>3PL Revenue</th>
<th>Logistics Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>$162</td>
<td>$1,592</td>
</tr>
<tr>
<td>North America</td>
<td>$128</td>
<td>$1,641</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>$137</td>
<td>$1,779</td>
</tr>
<tr>
<td>Central/South America</td>
<td>$28</td>
<td>$414</td>
</tr>
<tr>
<td>Other Countries</td>
<td>$52</td>
<td>$1,198</td>
</tr>
</tbody>
</table>

Global 3PL Market = US$ 507 Billion

Source: Ryder System, 2012

Logistic expenditure by country

<table>
<thead>
<tr>
<th>Country</th>
<th>2010 GDP¹</th>
<th>Logistics (GDP %)</th>
<th>2010 Logistics Cost</th>
<th>% Outsourced</th>
<th>2010 3PL Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>14,590</td>
<td>8.3%</td>
<td>1,211</td>
<td>10.5%</td>
<td>127.3</td>
</tr>
<tr>
<td>China</td>
<td>5,878</td>
<td>18.1%</td>
<td>1,064</td>
<td>7.0%</td>
<td>74.5</td>
</tr>
<tr>
<td>Japan</td>
<td>5,459</td>
<td>8.7%</td>
<td>475</td>
<td>8.8%</td>
<td>41.6</td>
</tr>
<tr>
<td>Germany</td>
<td>3,316</td>
<td>8.3%</td>
<td>275</td>
<td>10.1%</td>
<td>27.8</td>
</tr>
<tr>
<td>Brazil</td>
<td>2,090</td>
<td>11.6%</td>
<td>242</td>
<td>8.2%</td>
<td>19.9</td>
</tr>
<tr>
<td>France</td>
<td>2,583</td>
<td>9.2%</td>
<td>238</td>
<td>10.1%</td>
<td>24.0</td>
</tr>
<tr>
<td>India</td>
<td>1,538</td>
<td>13.0%</td>
<td>200</td>
<td>5.7%</td>
<td>11.4</td>
</tr>
<tr>
<td>Italy</td>
<td>2,055</td>
<td>9.4%</td>
<td>193</td>
<td>10.6%</td>
<td>20.5</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2,247</td>
<td>8.5%</td>
<td>191</td>
<td>10.0%</td>
<td>19.1</td>
</tr>
<tr>
<td>Canada</td>
<td>1,574</td>
<td>9.9%</td>
<td>156</td>
<td>8.4%</td>
<td>13.1</td>
</tr>
</tbody>
</table>

Main companies in freight and logistics (Revenue 2011 > 4 B$)

World Top Logistics Services Providers
(By Turnover in Billion USD, 2011)

Source: Patrick Rigot-Muller, 2012

The industry of freight and logistics in the world
(46 companies with income > 4 B$ 2011)

<table>
<thead>
<tr>
<th>Region</th>
<th>Freight Logistics</th>
<th>Parcels Logistics</th>
<th>Rail Freight</th>
<th>Road Freight</th>
<th>Sea Freight</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>6.5</td>
<td>13.0</td>
<td>15.8</td>
<td>88.7</td>
<td></td>
<td>123.9</td>
</tr>
<tr>
<td>Australia</td>
<td>8.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.2</td>
</tr>
<tr>
<td>Europe</td>
<td>150.8</td>
<td>24.5</td>
<td>35.4</td>
<td>4.8</td>
<td>76.9</td>
<td>292.3</td>
</tr>
<tr>
<td>Middle East</td>
<td>4.7</td>
<td>92.4</td>
<td>76.1</td>
<td>26.5</td>
<td></td>
<td>206.1</td>
</tr>
<tr>
<td>North America</td>
<td>11.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>181.2</strong></td>
<td><strong>129.8</strong></td>
<td><strong>127.3</strong></td>
<td><strong>31.3</strong></td>
<td><strong>165.5</strong></td>
<td><strong>635.2</strong></td>
</tr>
</tbody>
</table>

Source: Patrick Rigot-Muller, 2012.
M&A and consolidation: the case of the Deutsche Post AG

- Restructuration has deeply turned around the worldwide structures of logistics within the last 10 years. This trend is not yet over. The case of Deutsche Post DHL (470,000 employees, income: 70 B$) is a key example.

Deutsche Post DHL Major Acquisitions

<table>
<thead>
<tr>
<th>Year</th>
<th>Parcels</th>
<th>Freight &amp; Logistics</th>
<th>Air Freight &amp; Forwarding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>GP Paket Logistik (D)</td>
<td>Securicor Distribution (UK)</td>
<td>DANZAS Holdings (CH)</td>
</tr>
<tr>
<td>1999</td>
<td>Serviso (PL)</td>
<td>DHL International (DE)</td>
<td>Trans-o-Flex (D)</td>
</tr>
<tr>
<td></td>
<td>Ducros (FR)</td>
<td>Global Mail (US)</td>
<td>Nedlloyd Log (NL)</td>
</tr>
<tr>
<td></td>
<td>Global Mail (US)</td>
<td></td>
<td>ASG (SW)</td>
</tr>
<tr>
<td></td>
<td>MIT (IT)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Other examples: K+N (Hays), CEVA (EGL-TNT)

Main WW 3PL (freight forwarding & contract logistics)

6/ Metrics of logistics and Supply Chain performance

The performance indicators of the SC

- Customer service level
- Forecast accuracy
- Total Supply Chain cost
- Inventories value
- « Delivery-to-cash » lead-time
- Capacity utilisation rate of the production and logistics facilities including trucks and containers
- Value of the destroyed products due to the obsolescence
- Competitive positioning of the logistics services by segment
- Rush orders (Express transportation)
- CO2/km
- # miles in total and # miles with empty trucks
7/ Trends in Logistics and Supply Chain Management

- Design and eco-friendly design
- New IT solutions
- Recycling
- Urban distribution + logistics park

Design / Management

TIME

Research Development & Marketing Manufacturing Distribution After Sales Services Recycling

EXPENSES

COMMITTED Life Cycle Cost

VERY SOON!

60 85 95 50
Packaging: Value for the customer (Isover)

Less storage Cost
Less Transportation Cost

Value creation at the interface of R&D and SCM: An example within the car industry

- Packaging volume: 261.0 l/veh
- Total investment: 8K€
- Operating cost (transportation + logistics): 2.23€/veh

- Packaging volume: 516.9 l/veh
- Total investment: 321K€
- Operating cost (transportation + logistics): 3.18€/veh
Supply Chain Management Solutions

The Auto-ID enabled Value Chain and Key Benefit Areas

Cost
- Reduced labor costs
- Lower shrink costs
- Lower inventory costs
- Reduced reconciliation costs
- Reduced returns costs

Revenue
- Improved product availability on shelf
- Increased cross channel selling opportunities
- Enhanced ‘point of decision’ sales capabilities

Operational Effectiveness
- Improved product visibility
- Improved asset & labor visibility
- Improved data accuracy
- Reduced handling requirements
- Greater temperature & product rotation control

"This isn’t about being the only one to use an emerging technology. It’s about being first. That’s Wal*Mart’s competitive advantage". Kevin Turner, Wal*Mart

---

Illustrative

1. Supplier
   - Tag: Raw materials and finished goods.
   - Read: On production line, storage locations, and exist

2. Warehouse
   - Tag: Barcodes, containers
   - Read: DC gate, DC backdoor, MHE, shelf location

3. Store
   - Tag: Case, totes, item
   - Read: Back door, storage location, shelf, POS, entrance

4. Home
   - Tag: Vehicle, order, item, Handheld
   - Read: Fixed proximity /location

---

"This isn’t about being the only one to use an emerging technology. It’s about being first. That’s Wal*Mart’s competitive advantage". Kevin Turner, Wal*Mart
Radio Frequency Identification (RFID)

Bar code

RFID Tag

RFID advantages compared to bar codes
- No contrast issue
- Automated and simultaneous reading
- Reading field

Global standards for RFID identification

Full and detailed visibility on the overall supply chain

- A global standards system which combines RFID, current communication infrastructures and the Electronic Product Code (EPC) (unique identification per item)
- Immediate and automated identification through the supply chain
- Better efficiency and visibility all over the supply chain
- Interoperation capability
- Minimize over cost, secure demand, reduce inventory level
The EPC concept and codification

- EPC for Electronic Product Code
- Concept designed by American researchers since 1999. The roll out has been delegated to GS1 since 2003.

Objectives:
- Link all tangible objects to Internet
- Synchronize on real time good flows and information flows

**ELECTRONIC PRODUCT CODE**

- Header: 0-7 bits
- EPC Manager: 8-35 bits
- Object Class: 36-59 bits
- Serial Number: 60-95 bits

Automated identification

- Picking control
- Automated inventory
  - Lost packages track
- Shippings and reception controls
- Palett content control
- Support to picking
Example: Generic scheme for collection in the electrical and electronic equipment (WEEE) waste activity

- The general plan for collection is defined on the basis of two types of platforms receiving electrical and electronic waste (big household appliances, flat-panel displays, etc.) coming from various collection points:
  - Collection points requiring provision of facilities/support, taken up by tare or carrier pick-up rounds;
  - Grouping platforms, with local/town range, on a smaller scale, on which simple grouping operations take place;
  - Platforms for grouping/break-up, on a multiple town / multiple area basis, on which sorting, grouping and break-up operations are organised.

Case-study: Veolia Propreté – French leader for recycling waste

Main activities for the WEEE value chain
- Definition of value chains for all the sub-categories of products:
  - Big white appliances excluding fridges, freezers and air conditioning
  - Big appliances generating cool temperature
  - Small consumers electronics
  - All consumer electronics with screens

- Calculation of the critical distances for the collection process for:
  - The main sites
  - The upstream platforms for collection

- Those distances have been calculated site by site accordingly with the future volumes for each sub-category of products
Logistics infrastructures: the concept of logistic park

- Consistent relationship of buildings with their close environment
- Integrated choice of building process and materials
- Building works with low impact on environment
- Eco management
- Comfort and health

Environmental regulation for the logistics infrastructures

**Environment approach**
- Consistent relationship of buildings with their close environment
- Integrated choice of building process and materials
- Building works with low impact on environment
- Eco management
- Comfort and health

**Possible approach**

### Design
- Eco-responsible building works
- Selection of building process and materials
- Integration of buildings in the landscape
- Power management
- Production of alternative energies

### Exploitation
- Work environment
- Access, security and comfort
- Selective waste dispatching and recycling
Logistics infrastructures: production of energy

• Example 1 : Implementation of a sun break system :
  ➢ Photovoltaic surface : 196 m²
  ➢ Installed power : 26.4 kWc
  ➢ Yearly production : 33,000 kWh
  ➢ Yearly income 1 : 18,500 €/year
  ➢ Installation cost : 182,000 €

• Example 2 : installation on the roof
  ➢ Photovoltaic surface : 33,124 m²
  ➢ Installed power : 1,127 kWc
  ➢ Yearly production : 1,162,798 kWh
  ➢ Yearly income 1 : 662,000 €/year
  ➢ Installation cost : 6,500,000 €

• Example 3 : installation on the roof
  ➢ Photovoltaic surface : 10,780 m²
  ➢ Installed power : 678 kWc
  ➢ Yearly production : 760,690 kWh
  ➢ Yearly income 1 : 433,600 €/year
  ➢ Installation cost : 4,400,000 €

Logistics infrastructures: production of energy

And tomorrow…
8/ Levels of logistics maturity

The 4 maturity levels of Supply Chain / logistics

- Integration
- Extended optimisation
- Business Vision
- Complexity

No Supply Chain

Fragmented and incomplete Supply Chain

Supply Chain integrated but limited to in house scope

Supply Chain extended to the Value Chain
**Level of maturity 1: Principles and features**

1. No Supply Chain: sequential approach of physical operations and optimisation of the resources:
   - Focus on transportation
   - Economic optimisation, operation research, key target: the productivity
   - Logistics = cost-added
   - No function, no expertise, no sector
   - Scope limited to the in-house activity
   - Push logic

**Level of maturity 2: Principles and features**

2. Fragmented and incomplete Supply Chain:
   - Objectives focused on cost reduction relative to the order processing, the holding inventory, but as well the customer service improvement
   - Flows management within the company and the distribution channels
   - Retailers logistics and subcontracting of logistics
   - Management of the interface between the push flow and the pull flow
   - Set up of dedicated functions and expertise development
**Level of maturity 3: Principles and features**

3. Supply Chain integrated but limited to in house scope:
   - Customer service: the concept of value-added
   - The interdependency of the involved functions: the cross-functionality
   - The information flows at the three levels:
     - Operational
     - Flows monitoring (tactic)
     - Strategic

**Level of maturity 4: Principles and features**

4. Supply chain extended to the Value Chain:
   - A business process within the firm oriented to the creation of value for the customer
   - A profit leverage of the invested assets: to get further benefits beyond the level 3.
   - A positive field for implementing the new IT solutions
   - The SCM approach enables:
     - A trade-off between the centralization of some logistics activities (monitoring, planning, operating) and the decentralization of some others (continental logistics, local customer service management)
     - The sharing or the specialization of logistic resources depending on:
       - The synergies between the businesses
       - The logistic profiles
The major components of SCM

- Six components define the vision in terms of Business Model of Supply Chain:
  - Contribution of Supply Chain to the strategy
  - Organization - actors - skills
  - Logical monitoring and process
  - IT solutions
  - Logistic operations
  - Performance Control

Strategic variables
- Context and strategic drivers
- Product portfolio
- Distribution channels
- Competitive analysis
- Evolutions of technologies

The SCM Assessment Matrix

- In order to assess the SCM maturity, the six components of SCM are scored
- Four SCM maturity levels are characterised on each SCM component (Strategy, Organisation, Process, IT, Operations, Performance):

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Organization</th>
<th>Monitoring</th>
<th>Information Systems</th>
<th>Operations</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute 1</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
</tr>
<tr>
<td>Attribute 1</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
</tr>
<tr>
<td>Attribute 1</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
</tr>
<tr>
<td>Attribute 1</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
</tr>
<tr>
<td>Attribute 1</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
<td>Attribute N</td>
</tr>
</tbody>
</table>

- Level 1: Poor
  - No Supply Chain

- Level 2: Below average
  - Fragmented and incomplete Supply Chain

- Level 3: Well developed
  - Supply Chain integrated but limited to in house scope

- Level 4: Most advanced
  - Supply Chain extended to the Value Chain
The breakthrough targeted by the Supply Chain

To go from …

- A fragmented Logistics
- A «Push» Logistics (from operations towards markets)
- A monolithic Logistics

… to …

- An integrated Supply Chain process
- A «Pull» Logistics (from markets towards operations)
- A differentiated Logistics based on a permanent trade-off process «service value vs cost»

Key messages (1/2)

- Supply Chain is a business process which support business development and business performance by:
  - fulfilling the customer demand
  - designing solutions which deliver the expected service level
  - optimizing the overall cost
- The most advanced Supply Chain makes a differentiation in terms of their offer based on a segmentation of customers
- The double trade-off: service vs cost, standard vs custom, is a part of Strategy
Key messages (2/2)

- Information Technology can support the Supply Chain process by implementing collaborative solutions between functions within the company. Trust is a pre-requisite.

- The continuous improvement of the Supply Chain performance is based on the SC managers ability to design ready-to-implement solutions and to market them.

- The quality of the communication on the achieved results is crucial

- Training the right competences (inventory management, transportation plan, warehouse process, logistic offer, …)