Don’t Ignore Data Quality In Your Supply Chain!

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ASQ WCQI – May 3, 2018
Introduction

• Siemens Corporation
  – OpsEx/Business Excellence Consultant (aka Lean Guy)
  – Low Voltage Electrical Management Division, Roebuck SC
• ASQ CSSBB, 2010
• ASQ CSSGB, 2009
• MBA, Indiana University
• BS ChE, Tri-State University (Indiana)
Learning Objectives

- How is the use of data across a global supply chain changing?

- What are the growing data requirements from customers, and what problems do they cause?

- How can manufacturers handle these new challenges?

- What new technologies for streamlining supply chain data can help manage change?
What is a Supply Chain?
What is a Supply Chain?

Basic Data: Purchase orders, packaging designs, destination data

Basic Data: Invoices, Bill of Lading, product info, shipping info

VENDOR

SIEMENS
Ingenuity for life

TRADING PARTNERS

DATA & CASH
DATA & CASH
DATA & PRODUCTS
DATA & PRODUCTS
What is a Supply Chain?

Diagram showing the flow of demand and product in a supply chain, with raw material suppliers connected to Tier 2 suppliers, who in turn supply Tier 1 suppliers, leading to the manufacturer, dealers, and consumers.
Order-To-Cash Process

SUPPLIER

ORDER

WHSE

BOL

Invoice

CUSTOMER
Order-To-Cash Process

SUPPLIER

ORDER

WHSE

BOL

Invoice

CUSTOMER

$\$\$

ORDER
What data is shared?

SUPPLIER

PRODUCT CATALOG

CUSTOMER

ORDER

WHSE

BOL
What data is shared?

- SUPPLIER
- CUSTOMER
- ORDER
- BOL
- WHSE

ORDER

PRODUCT CATALOG

- Item #, size, brand, description, pack, weight, country of origin
What data is shared?

SUPPLIER

ORDER

PRODUCT CATALOG

CUSTOMER

Item #, lot #, quantity, delivery date, delivery location

ORDER

WHSE

BOL
What data is shared?

SUPPLIER

ORDER

PRODUCT CATALOG

CUSTOMER

ORDER

WHSE

BOL

Item #, lot #, quantity, delivery date, delivery location, warehouse location
What data is shared?

- SUPPLIER
- ORDER
- PRODUCT CATALOG
- CUSTOMER
- ORDER
- WHSE
- BOL

Item #, lot #, quantity, delivery date, delivery location, shipping means
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Customer Data Expectations

Customers have online catalogs with product data sourced from vendors/manufacturers.

Source: walmart.com
Customer Data Expectations

Whirlpool 24.5-cu ft 4-Door French Door Refrigerator with Ice Maker (Fingerprint-Resistant Stainless Steel) ENERGY STAR

Item # 754716 Model # WRX735SDHZ ★★★★★ (187 Reviews)

Multiple views:
- Angles
- In/out of box
- Open/closed
- 360°
- In use

Source: lowes.com
Customer Data Expectations
Customer Data Expectations

SUPPLIER

DATA POOLS

DISTRIBUTORS
Customer Data Expectations

• Continuously expanding
  – More and more supply chain data!
    • Transparency and visibility
    • Who, What, When, Where, Why, How
  – Rich data - images, videos, special views
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• Why?
  – Consumer safety & sophistication
  – Online/mobile availability of rich data
  – Evidence of ethical compliance
Complexity leads to errors
“Perfect Order”

- Measure of supply chain performance
- % of orders that are deemed “perfect”:
  - Shipped on time to right location
  - Shipped as complete and accurate
  - Shipped damage-free
  - Shipped with correct documentation
### Perfect Order Metric

<table>
<thead>
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<th>Perfect Order Metric</th>
<th>40th Percentile</th>
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<tbody>
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<td>&gt; 98%</td>
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Source: WERC Watch Spring 2015 Report
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Higher expectations for data and delivery performance add complexity!
What happens with bad data?

- Lost sales
- Rework/reconciliation
- Customer fines
- Product obsolescence
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Bad Data = Higher Costs + Loss of Revenue!!
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Handling Challenges

• First, where do challenges occur?
  – Product information delivery to customers
  – Warehouse and inventory management
    • Picking right items
    • Managing inventory to accuracy
  – Transportation management
  – End-to-end supply chain transparency
Handling Challenges

• Next, how are they challenges?
  – Updating product information manually
    • Physically rigorous and taxing
    • Manual intervention leads to errors
  – Product obsolescence/inventory inaccuracy
  – Less-than-full containers and trucks
  – Product traceability breakdowns
Handling Challenges

• How can we improve processes?
  – Automation of product information updates to customers
  – Streamlined inventory management
  – Transportation consolidation and optimization (shipments to AND from)
  – Standardization and automation of product/lot management
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Data Synchronization (Pool)
Updating Data Pools

SUPPLIER → DATA POOLS → DISTRIBUTORS
PIM System

SUPPLIER

PIM SYSTEM

DATA POOLS

DISTRIBUTORS
Warehouse/Transportation

• Synchronization of supply chain and ERP systems
  – Warehouse Management Systems (WMS)
  – Transportation Management Systems (TMS)
CAUTION: MAY IRRITATE EYES. Do not get in eyes. Do not reuse this package for dispensing beverages or other liquids. KEEP OUT OF REACH OF CHILDREN. FIRST AID TREATMENT: Contains biodegradable surfactants and enzymes. If swallowed, give a glass of water or milk and call a Poison Control Center or doctor. Do not throw in trash can. Do not use in public or community disposal systems. Not for use in septic systems. Do not use to clean toilet, garbage disposal, or wet/dry vacuum.
GS1 Standards & GS1-128
EDI & ASN

- Electronic Data Interchange (EDI)
- Advance Ship Notice (ASN)
Blockchain

Block 10
- Prev_Hash
- Timestamp
- Tx_Root
- Nonce

Block 11
- Prev_Hash
- Timestamp
- Tx_Root
- Nonce

Block 12
- Prev_Hash
- Timestamp
- Tx_Root
- Nonce

Hash01
- Hash0
- Hash1

Hash23
- Hash2
- Hash3

Tx0
Tx1
Tx2
Tx3
Jabil InControl

Source: incontroltower.com
Other kinds of technology

- RFID tags
- Certification and compliance portals
- SmartLabel
Optimization Tools

- BLOCKCHAIN
- SUPPLIER
- ORDER
- PRODUCT CATALOG
- DATA POOL
- PIM
- WHSE
- GS1
- WMS & TMS
- ASN
- EDI
- PORTALS
- CUSTOMER
- BOL
Learning Objectives Recap

• How is the use of data across a global supply chain changing?
  – *More, faster, better!*

• What are the growing data requirements from customers, and what problems do they cause?
  – *More manual management leads to errors!***
Learning Objectives Recap

• How can manufacturers handle these new challenges?
  – *Automation, streamlining, consolidation, transparency!*

• What new technologies for streamlining supply chain data can help manage change?
  – *WMS/TMS, EDI/ASN, PIM systems, GS1 barcoding standards, Blockchain, etc.!*
Questions?

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Complexity leads to errors

Source: NACAS 1FoodService Portal