Labels and Data: How to Achieve B2B Supply Chain Excellence

Peter Zalinski
Barcoding, Inc.
Supply Chain “Go and See”
Supply Chain “Go and See”

- **PPT**
  - Process
  - People
  - Technology…

- **C³**
  - Reduce Costs
  - Increase Cashflow
  - Improve the Customer Experience
Objectives

- Identify B2B Supply Chain Excellence
- Improve the Customer Experience
- Use GS1 Standards: a Platform for Success
  - Identify
  - Capture
  - Share
  - And Use
What’s your B2B experience like if you need one of these in a hurry?
B2B: Maintenance needs a part

1. Production is Down
2. Ordered Parts
3. Shipment Arriving (LTL) Today
4. Line to Resume by EOD
5. Waiting
The pallet arrives
The case you need
The packages inside
The unit you need
“Needle in the haystack”
How long will you wait?

- Receive and Unload Pallet
- Validate BOL to PO
- Inspect Goods
- Match Order
- Check Quality
- Enter Receipt into ERP
- Put Away or Expedite
Manual receipt process: DISCOVERY

- Receive and Unload Pallet
- Validate BOL to PO
- Inspect Goods
- Match Order
- Check Quality
- Enter Receipt into ERP
- Put Away or Expedite

1 to 4 Hrs
Automated receipt process: DIRECTED

- Receive and Unload Pallet
  - Validate BOL to ASN
  - Match Order
  - Enter Receipt into ERP
- Inspect Goods
- Check Quality
- Put Away or Expedite

< 20 Min
B2B Excellence

• Pallet SSCC is Scanned at Dock into WMS
  • Directed to RUSH Location for Breakdown

• All Cases Get Scanned for Handling
  • Rush Item Gets Expedited to Maintenance

• Time Elapsed: Typically 20 Minutes or Less
B2B: MRO Costs Comparison

- Line is down, Cost is $10,000 per minute
- Receiving:
  - Standard 3PL Fees = $45/hour for handling inventory
  - Cost Average @ 1 minute per touch = $0.75/touch

- Best Case Manual Receipt:
  - 27 minutes = $270,020.25

- GS1 Automated Receipt:
  - 13 minutes = $130,009.75
B2B: MRO Costs Comparison

- GS1 Receiving is:
  - More efficient
  - More accurate
  - More connected
  - More Cost Effective

<table>
<thead>
<tr>
<th></th>
<th>Touches Required</th>
<th>Manual</th>
<th>GS1</th>
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<tbody>
<tr>
<td><strong>Receive</strong></td>
<td></td>
<td></td>
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<tr>
<td>Pallet</td>
<td>1</td>
<td>1</td>
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<tr>
<td>BOL</td>
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<tr>
<td>Search for PO</td>
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<td>Stage Pallet</td>
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<td>Breakdown 5 layers</td>
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<td>ERP, 10 Lines</td>
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<tr>
<td><strong>Expedite</strong></td>
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<tr>
<td>Pallet</td>
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<tr>
<td>Case</td>
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<td>Pack</td>
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<td>Unit</td>
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<td>Alert Maintenance</td>
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<td>Perform Transfer</td>
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<td>Record Transfer</td>
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<td><strong>Time in minutes</strong></td>
<td>27</td>
<td>13</td>
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<tr>
<td>Handling Cost</td>
<td>$20.25</td>
<td>$9.75</td>
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<tr>
<td>Downtime Cost</td>
<td>$270,000.00</td>
<td>$130,000.00</td>
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</table>
Using GS1 Standards for receiving

• Pallet SSCC is Scanned at Dock into WMS
  • Directed to RUSH Location for Breakdown

• All Cases Get Scanned for Handling
  • Rush Item Gets Expedited to Maintenance

• Time Elapsed: Typically 20 Minutes or Less
Benefits of GS1 Standards

• Reduced Inefficiencies
• Improved Product Information
• Enhanced Traceability
• Electronic Order Management
• Automatic Data Capture
• Inventory Visibility
• *Operational Excellence*
Supply Chain / Value Chain Evolution

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<table>
<thead>
<tr>
<th>Relevance across the value chain</th>
<th>Data security &amp; privacy</th>
<th>Traceability</th>
<th>Sustainability</th>
<th>On-demand logistics &amp; services</th>
<th>Automation &amp; Smart Everything</th>
<th>Empowered consumers</th>
<th>Mass customisation</th>
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<tr>
<td>Upstream</td>
<td>Orange</td>
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<td>Retail</td>
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<td>Fulfilment</td>
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<td>Green</td>
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<td>Pink</td>
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<tr>
<td>Use</td>
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<td>Light Blue</td>
<td>Pink</td>
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<td>End of life</td>
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<td>Light Blue</td>
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<td>Light Blue</td>
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Where GS1 Standards are relevant to the value chain

26 APRIL 2019 - Business trends and the GS1 value chain, GS1.org
GS1 Standards: a common language

- **Identify**
  - Physical and digital identity for products, logistics units, locations, assets, documents, relationships and events

- **Capture**
  - Capture, store, locate, retrieve and analyze data about the things identified

- **Share**
  - Actionable data
  - Data sharing standards for interoperability
    - EPCIS + CBV

- **Use**
  - Automate your interaction with the supply chain
Improving the Customer Experience

The Progression of Economic Value

- Differentiated
  - Experience
    - Service
  - Goods
- Competitive Position
- Undifferentiated
  - Commodity

Value-add activities

- Barcode
- RFID
- Store
- Truck
- Shipping
- Factory

POWERED BY POSSIBILITIES.
GS1 value add activities

- Customer compliant labelling
  - Item
  - Carton
  - Case-Pack
  - Pallet
- Serial Shipping Container Codes (SSCC’s)
  - License Plates
- ASN’s / EDI
  - Dispatch advice = shared data
Shared Data

5W’s + H

= $aving$
Sharing your data

1WorldSync

1. Source Datapool
2. GS1 Global Registry
3. Recipient Datapool
4. Data Recipient
5. Data Source
GS1 solves the Master Data problem

1WorldSync

• Every company has a database filled with master data about the products they make, sell, or buy.
• When a company changes any bit of that information in their database or adds a new item, other databases can become outdated.
• Sync your master data, share it with trading partners.
Share your information B2B

Supply Chain: Two or more parties CONNECTED by a flow of Information, Goods and Money that fulfills a customer request.

- Information: Order
- Goods: Delivery
- Money: Payment
Share your information B2B

Supply Chain: Two or more parties CONNECTED by a flow of Information, Goods and Money that fulfills a customer request.

- Information: Order, Order Confirmation
- Goods: Delivery
- Money: Payment
Supply Chain: Two or more parties CONNECTED by a flow of Information, Goods and Money that fulfills a customer request.

• Or (more likely) THIS:

- Information: PO, Order Confirmation
- Goods: Delivery, Invoice
- Money: Payment, RMA Request, RMA
- Goods: Return, Credit
B2B Supply Chain Excellence

EDI

EPCIS
Electronic Data Interchange
Global Language of Business

• EPCIS
  • a GS1 and ISO Open Standard
  • Helps share visibility data across & between enterprises
  • Defines technical interfaces & framework data model using the Common Business Vocabulary (CBV)
  • Identify the “What” “When” “Where” & “Why” of visibility events
Global Language of Business

The 4 Data Dimensions of an EPCIS Event

• **What** objects are the subject of event?
  • Individual objects (SGTIN) or groupings (GTIN + lot/batch)

• **When** did this event take place?
  • Date, time, time zone offset

• **Where** did this event occur?
  • GLN of the physical location (SGLN)

• **Why** did this event take place?
  • Business Step (e.g. “Shipping”) and Disposition (e.g. “in transit”); Business Transaction; Source/Destination
Global Language of Business

What are the Benefits of EPCIS?

• Increased product safety through traceability
• Improved inventory management
  • Increased on-shelf product availability
  • Reduction of out-of-stock
• Increased counterfeit protection
• Improved theft prevention
• Data for Analytics
Global Language of Business

• **GDSN** – Global Data Synchronization Network  MASTER DATA
• **GLN** – Global Location Number  WHERE
• **SSCC’s** for Logistics Units  WHAT, OBSCURED
• **GTIN’s with Application Identifiers** (AI’s) for Handling Units  WHAT, DETAILED
• **SGTIN** – Serialized Global Trade Item Number  WHAT, PRECISELY
  • RFID / EPC
  • Blockchain
Identify the pallet
Identify the pallet: GS1 Transport Label

**MNA MANUFACTURING**
2023 N Marshall Blvd
New Berlin, WI 53151

**Ship to:**
STP Fabrication LLC
7321 N 2nd St
Milwaukee, WI 53201

**SSCC:**
059076543210000091

**Free Formatted Info**

**Clear Text Info**

**GS1-128 Barcode with Clear Text Info**

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**Powered by Possibilities.**
Identify the carton: GS1 SSCC or GTIN

Carton License Plate

GS1-128 Content Label
Identify the case-pack

MNA MANUFACTURING
GTIN: 00590765412342
LOT: ABCDEF123456

(01) 0 0590765 41234 2 (10) ABCEDF123456

GS1-128 Content Label
Identify the item

Details

MNA MANUFACTURING
Really Important Widget
GTIN: 0 0590765 41234 2
LOT: ABCDEF123456

GS1-DataMatrix Item Label
Identify all Handling Units using GS1 Standards

Case-Pack Unit

Item Unit

Carton Unit

Logistics Unit
Capture, share and use
Benefits of GS1 Standards

• Reduced Inefficiencies
• Improved Product Information
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• Automatic Data Capture
• Inventory Visibility
• *Operational Excellence*
RETAIL

POWERED BY POSSIBILITIES.
B2B?

- Innovators: 2.5%
- Early Adopters: 13.5%
- Early Majority: 34%
- Late Majority: 34%
- Laggards: 16%
Challenges of adopting new technology

- Financial Justification/ROI/Budget: 38%
- Lack of Time: 18%
- Lack of Experience with New Technology: 15%
- User Buy-In/Adoption: 13%
- Fear, Uncertainty, Doubt: 9%
- User Interface (UI/UX) Modernization: 9%
- Migrating TelNet: 1%
- Outdated Wireless Infrastructure: 11%
- Change Management: 10%
- Retiring & Disposing of Old Technology: 11%
- Software App Migration: 24%
- Integration to Back-End Systems (ERPs): 24%
- Stakeholder/Leadership Buy-In: 9%
- Reallocating Labor: 4%
- Updates to Processes: 10%
- Lack of Internal Resources: 16%
- Choosing the Right Hardware: 14%
- Planning/Project Management: 15%

Barcoding: Future Proof Your Supply Chain: A 2019 Study
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Where GS1 Standards are relevant to the value chain

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GS1 Fundamentals

• It all starts with the GS1 Company Prefix

14-digit GTIN format

N1 Digit:
- Always 0 for consumer sale unit (GTIN-12, GTIN-13)
- Possibly 1-8 for logistic unit not sold at point-of-sale (case, pallet, etc.); in which case it is called the “indicator” digit

GS1 Company Prefix
- Allocated by GS1 to the company that allocates the specific GTIN (typically, but not necessarily, the brand owner)
- Between 4 and 11 digits in length (see footnote, page 16)
- First 3 digits are the GS1 Prefix, indicating which GS1 MO provided the numbering capacity from which this GTIN was allocated

Item Reference
- Allocated by the recipient of the GS1 Company Prefix to identify a specific trade item
- Between 6 and 1 digits in length, depending on the length of the GS1 Company Prefix (always 12 in total)

Check Digit
- Calculated as a function of the other digits, to protect against keying errors
GS1 Fundamentals

GS1 Company Prefix: 0614141000

Global Location Number

Legal Entity GLN: 061414100000005

UPC Company Prefix: 614141000

For use in creating GS1 Identification Numbers

Global Trade Item Number (GTIN)
Serial Shipping Container Code (SSCC)
Global Location Number (GLN)
Global Identification Number for Consignor (GINC)
Global Service Relation Number (GSRN)
Global Individual Asset Identifier (GIAI)
Global Returnable Asset Identifier (GRAI)

For use when creating UPC. barcodes

U.P.C. Company Prefix: 614141000

To continue the use of this prefix, your license must be renewed on or before: XX/XX/XX

Bob Carpenter, President, GS1 US
GS1 Fundamentals

• Serialized Shipping Container Code on Shipping Label
  • Tied to Shipping ASN/ EDI
    • “Logistics License Plate”
    • SSCC / SSCC-18
    • GS1-128 barcode with Application Identifier (00)
  • Can be re-issued one (1) year after break-down
Identify people, places and things

Identify: GS1 Standards for Identification

- **GLN** Global Location Number
- **GTIN** Global Trade Item Number
- **SSCC** Serial Shipping Container Code
- **GRAI** Global Returnable Asset Identifier
- **GIAI** Global Individual Asset Identifier
- **GSRN** Global Service Relation Number

![Diagram showing GS1 standards for identification across various stages of logistics and healthcare, including GLN, GTIN, GSRRN, and GIAI.]
GS1 Fundamentals

- Global Location Number
- GTIN
- Serialized Shipping Container Code
- Global Returnable Asset Identifier
- Global Individual Asset Identifier
GS1 Fundamentals

- Global Location Number
- GTIN
- Serialized Shipping Container Code
- Global Individual Asset Identifier
- Global Service Relationship Number

GS1 System Keys

- GLN
- GIAI
- SCC
- GLN
- GSRN
Beyond the U.P.C.

• **Data-Rich / Attribute Scanning**
  • GS1-128
  • RFID Tags
  • GS1-DataMatrix
GS1 Fundamentals

- RFID EPC codes and SGTINS

Example: GTIN (01) 04012345777772 | Serial number (21) 123

Unit-level Traceability | AI(21) = S/N
GS1: A platform for sharing
Enabling Technologies are like building blocks

- Sensor Networks
- Data Analytics
- 5G
- Deep Learning / AI
- Robotics
- Cloud

GS1
They are stronger in combination

- Machine Intelligence
- Relevant Data + GS1 Standards
- Improved Sensors and Monitoring
- Hyperconnectivity and Cloud
EVERY INNOVATION BECOMES INFRASTRUCTURE

INTERNET OF THINGS, INDUSTRY 4.0, SMART FACTORY, AUTOMATION, ROBOTICS

HYPERCONNECTIVITY: 4G TO 5G, LPWAN, SENSOR NETWORKS, CUBESATS

CLOUD EVOLUTION: PUBLIC, PRIVATE, HYBRID, MULTI, VIRTUALIZATION, EDGE

MOBILE INTERNET: MOBILE BROADBAND, SMARTPHONE AND LOCATION, GS1

INTERNET PROTOCOL, WORLD WIDE WEB, MICROPROCESSORS, NETWORKS
For more information:

Speaker email: peter.zalinski@company.com
Website: www.barcoding.com

Or visit MODEX Booth # 4615