EPCIS for Lunch

An introduction to the WHAT, WHEN, WHERE and WHY of supply chain visibility

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The “Share” Layer of GS1 Standards

**Master Data**
- example: weight & physical dimensions of trade item class
- GS1 “Share” Standard: GDSN

**Transactional Data**
- Example: ORDERS, INVOIC
- GS1 “Share” Standards: GS1 XML, EANCOM

**Visibility Event Data**
- Physical activity in the supply chain of products and assets
- GS1 “Share” Standard: EPCIS
EPCIS . . .

- is a GS1 standard within GS1’s “Share” layer
- is not a product, service or out-of-the-box solution
- defines technical interfaces for capturing/sharing data
- defines a framework data model for event data
- helps create & share visibility data within/across enterprises
- is an enabler around which to build value-added services and solutions for supply chain visibility & asset management
- was updated with the May 2014 release of EPCIS 1.1
  - including support for Lot/Batch-based event data
- when used in a GS1 context, leverages GS1 Keys as the “what” and “where” of visibility events
Core Business Vocabulary (CBV)
another GS1 “Share” standard

- Companion standard to EPCIS
- Supplements EPCIS’ framework data model
- Defines specific data values to populate EPCIS data model
- Specifies vocabulary elements & values for EPCIS
- Ensures a common understanding of data semantics
- Critical to interoperability of EPCIS implementations
- Includes values & definitions for Standard Vocabularies
- Provides identification syntax rules for User Vocabularies
Four 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*

**WHERE** did this event take place?
*GLN of physical location & object’s subsequent whereabouts*

**WHY** did this event take place?
*Business step, Disposition (status), Source/Destination info*
EPCIS events
“WHAT” dimension

• Specifies what objects participated in the event
• Can be physical or digital objects
• EPCIS allows for two kinds of object identification:
  • Instance-level
    each identifier is unique to a single object
  • Class-level
    multiple objects carry the same identifier
EPCIS events - “WHAT” dimension

**Instance-level identification**

- **SGTIN**  Serialized Global Trade Item Number
- **SSCC**  Serial Shipping Container Code
- **GRAI**  Global Returnable Asset Identifier
- **GIAI**  Global Individual Asset Identifier
- **GSRN**  Global Service Relation Number
- **GDTI**  Global Document Type Identifier
- **ADI**  Aerospace & Defense Identifier
- **CPI D**  Component Part Identifier + serial
- **SGCN**  Serialized Global Coupon Number
EPCIS events - “WHAT” dimension

**Class-level identification**

- **GTIN**  Global Trade Item Number
- **GTIN + Lot/Batch**
- **GRAI** without serial
- **GDTI** without serial
- **GCN** without serial
- **CPI**D without serial
## Batch/Lot vs. Serialized: Visibility with differing granularity

<table>
<thead>
<tr>
<th>Feature</th>
<th>GTIN</th>
<th>GTIN + Lot</th>
<th>GTIN + Serial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Precision Identification</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium Precision Identification</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>High Precision Identification</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Additional data needs to be physically marked</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Serialization required</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Traceable item exist in multiple locations at the same time</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Traceable item exist only at one locations at the same time</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Product Recall</td>
<td>All units of a given GTIN</td>
<td>All units of a given GTIN + Lot</td>
<td>Only specific units with matching GTIN + Serial</td>
</tr>
<tr>
<td>Enables anti counterfeit measures</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Enables to monitor products with finite shelf life</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
EPCIS events
“WHEN” dimension

• Date of event
  *example*: 2015-04-22

• Time of event
  *example*: 15:52:00

• Time zone
  *example*: -03:30
EPCIS events
“WHERE” dimension

- **Read Point**
  - specific place that an event took place
  - identified by SGLN

- **Business Location**
  - place the object is assumed to be following the event
  - identified by SGLN
The “WHY” dimension of EPCIS events

Business Step
- Business process context of event
  *e.g.: Commissioning, Packing, Shipping, Unpacking*

Disposition
- Status of object subsequent to event
  *example: active, in_transit, sold, expired, recalled*

Business Transaction
- Link to transaction information

Source/Destination
- Transfer of ownership or possession
EPCIS event types

Object Event
- Observation of (or assertion about) object(s)

Aggregation Event
- Association between containing/contained object(s)

Transaction Event
- (Dis)Association of object(s) to business transaction(s)

Transformation Event  \textit{(new in EPCIS 1.1)}
- Object(s) consumed as inputs, produced as outputs
EPCIS event types

Aggregation Event

- Applied to set of contained/containing objects
- Strong physical relationship between containing/contained
- Action ADD:
  - Child objects aggregated to parent
  - Creation of new aggregation or addition of new children
- Action OBSERVE:
  - Observation of an aggregation (may be incomplete)
- Action DELETE:
  - Objects have been **disaggregated** from parent
  - Removal of subset of children or entire aggregation
Leveraging the EPCIS Query Interfaces

“Has my order been shipped?”
“How many cases do I need to pick up today?”
“Where are products from lot 1221, produced on April 20th?”
“What does the Chain of Custody look like?”
Visibility applications enabled by EPCIS

- Which parties have had contact with my shipment?
- When will the new vaccine be delivered?
- (When) was my shipment received by the recipient?
- Where was medication produced on April 11th shipped to?
- Which defibrilators are located where in the hospital?
- Where is all of the radioactive material at the clinic?
EPCIS implementations 2015 and beyond

- **Food / Fresh Produce** Packaging and Distribution
- Fresh **Fish** Packaging and Distribution
- Vehicle Visibility in **Rail**
- Digital **Coupon** Management in retail
- RTI management
- Asset management (tool/equipment inventory in **Oil/Gas**)
- **Tobacco** chain of custody
- **Apparel** Stock-Taking & Cycle Counting
- **Pharmaceutical** chain-of-custody
Certified EPCIS 1.0 solution providers

- Axway
- Covectra Inc.
- Dongguk University
- ECO, Inc.
- ETRI
- FastPoint Technologies
- Fosstrak Project (Auto-ID Labs)
- Hanmi IT
- IBM
- KTNET
- LG CNS CO., LTD.
- LG Hitachi

- LIT
- MetaBiz, Inc
- MetaRights, Ltd
- Microsoft
- NEC Corporation
- Nippon Telegraph & Telephone
- Samsung SDS
- SAP
- Serno Solutions Corp
- Smartag Solutions Berhad
- T-Systems International GmbH
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For further information on EPCIS...

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