Supply chain visibility with EPCIS

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24 June 2022

GS1 standards framework

Identify

Globally unique identification keys
Companies, Products, Locations, Patients, Providers, Assets, Logistics, Documents, Services, Shipments, Consignments

Capture

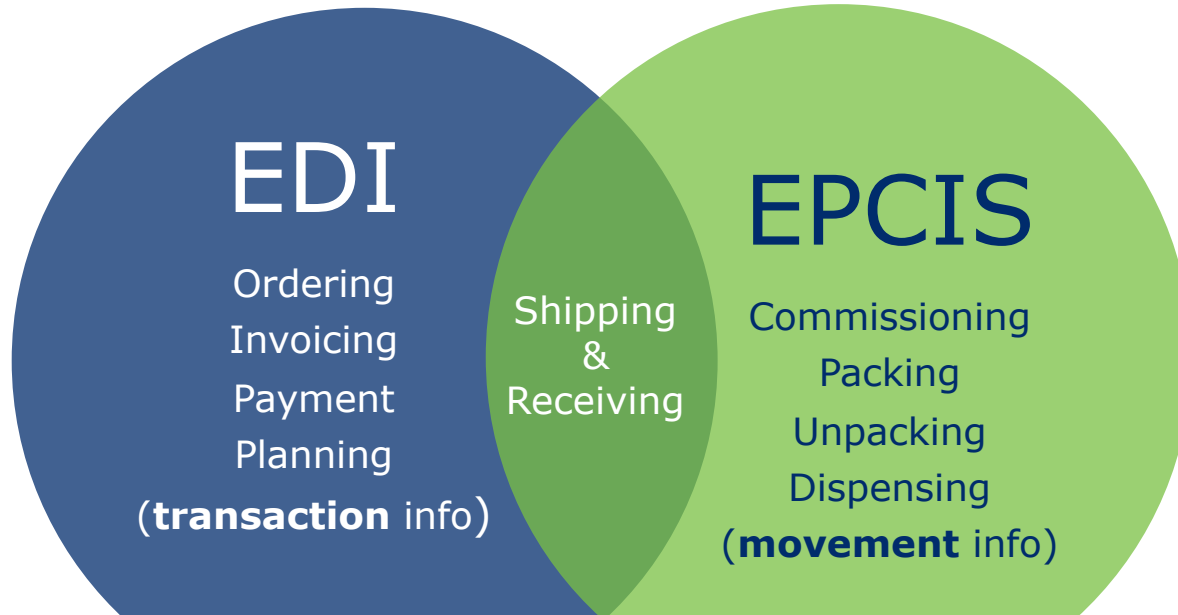**Automatic data capture**

Barcodes and EPC-enabled RFID

Share

Exchange of patient care & business critical information
Master Data, Transactional Data, Traceability & Event Data and Digital Content

Supply Chain Data Sharing & GS1 Standards

EDI

Ordering

Invoicing

Payment

Planning

(**transaction** info)

Shipping & Receiving

EPCIS

Commissioning

Packing

Unpacking

Dispensing

(**movement** info)

Master Data
Product & location descriptive attributes

EPCIS: a GS1 "Share" standard

Share

- Enables data-carrier neutral sharing of supply chain visibility data

- Also published as ISO/IEC 19987

- Defines a framework data model, query & capture interfaces

- Business process steps are captured as **"events"**, which indicate:
  - **What** objects are the subject of event?
  - **When** did this event take place?
  - **Where** did the event occur, and where are the objects thereafter?
  - **Why** did the event take place?
  - **How** (*warm, humid, fast, radioactive, etc*.) are the objects?

- EPCIS 2.0: first major update since 2007 launch, backward compatible

Supply chain visibility with EPCIS

- Tracking

  Where are the vaccines we shipped on 8 June?

- Tracing

  Which path did this shipment follow on its way to us?

- Chain of Custody

  Which parties had contact with these products along the way?

- Inventory Management and Maintenance

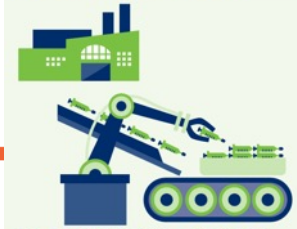 *How much vaccine is **available** in inventory?*

  *Which of the vaccines in our inventory **expire** soonest?*

  *When are technical components due for **maintenance**?*

- Recall

  Recall batch 102PQR packed on line 56A in calendar week 23 . . .
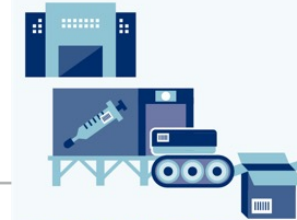

Product Traceability

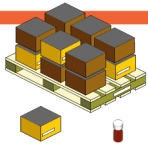e.g., "Where did a product come from and how was it made?"

Inventory

e.g., "Is there enough of the product in stock?"

Product Recall

e.g., "To which customer was a specific product shipped?"

Dimensions of an EPCIS event

What objects are the subject of event?
SGTIN, SSCC, GIAI, etc.

When did this event take place?
Date, time, time zone

Where did this occur…
…and Where are the objects thereafter?
Physical location (GLN)

Why did this event take place?
Process step, object status, link to transactions, etc.

How *(warm, humid, fast, etc.)* are these objects?
***Sensor**-monitored condition (New in EPCIS 2.0!)*

Manufacturing

Location Identification
GLN
Global Location Number
0614141000036

L

Item-Level Identification
DataMatrix

(01) 04012345123456
(21) AB1234
(17) 201206
(10) 20171009

Event 1

What	GTIN
Where	GLN
When	2017-02-01, 12:15:33
Why	Commissioning

{ "type": "gs1:MeasurementType-Temperature" , "value" : 26.2, "uom": "CEL" },
{ "type": "gs1:MeasurementType-Humidity" , "value" : 12.2 , "uom": "A93"},
{ "type": "gs1:MeasurementType-Speed" , "value": 162.0, "uom":"KMH"},

EPCIS enables tracking of **Aggregation** changes

- Parent-Child logistical hierarchy
  - Parent: one containing object
  - Children: one of more contained objects

- Captures **packing** and **unpacking** steps

Aggregation of items into a case   Aggregation of cases onto a pallet   Disaggregation of cases from a pallet   Disaggregation of items from a case
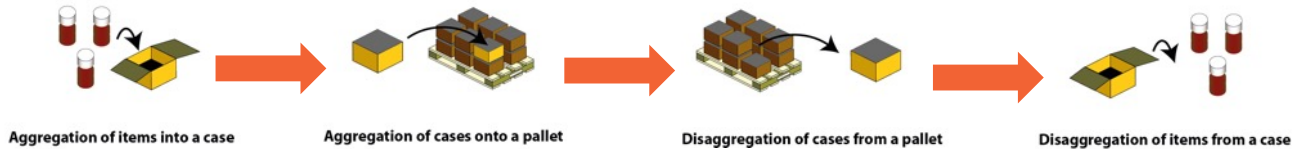
- Keep track of logistic / packing hierarchies
- Enables the practice of **inference**

Packing

Location Identification
GLN
Global Location Number
0614141000043

Item & Case-Level Identification
DataMatrix

(01) 04012345123456
(21) AB1234
(17) 201206
(10) 20171009

SSCC
Serial Shipping Container Code

(00) 340123451234567895

Event 2

What	GTIN+Batch/Lot, SSCC
Where	GLN
When	2017-02-02, 09:30:14
Why	Packing

EPCIS deployments gaining momentum in 2022-2023

- **Rail** rolling stock visibility & MRO

- **Fish** packaging & distribution

- **Fresh Fruit & Vegetable** traceability

- **Maritime / Port** capacity utilisation management

- **Pharmaceutical** chain-of-custody

- **Pandemic** supply chain security
  Inventory management of vaccines & PPE

EPCIS 2.0

New features to modernise EPCIS and lower adoption hurdles

EPCIS **1.2** (2016) provides support for:	EPCIS **2.0** (June 2022) adds the following new features:
XML	JSON & **JSON-LD**
SOAP	**REST** API
EPC URNs	GS1 **Digital Link** URIs
Bilateral sensor data	Reporting of detailed **sensor data**
PDF-based code lists	Browsable **Linked Data** models for EPCIS and for the Core Business Vocabulary (CBV), along with updates to GS1 Web vocabulary

Further info on supply chain visibility with EPCIS

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