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Using EPCIS Data Sharing for Full Supply Chain Visibility

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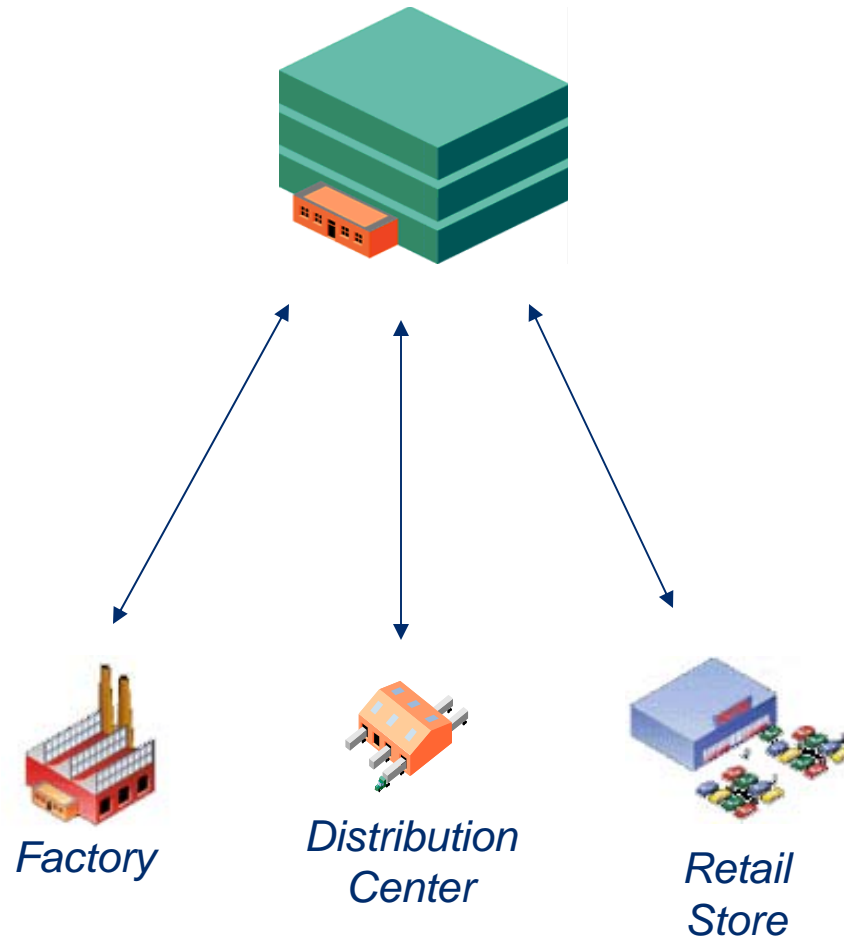


Agenda

- What Is EPCIS Visibility Data?
- What Does EPCIS Visibility Data Look Like?
- What Information Does it Contain?
- How Can You Benefit?



Visibility into the Physical World



- Business decisions are made here, in the company headquarters data center

- ...but there's an awful lot of important action **here**, in the real world.

➔ EPC and RFID technology can bring awareness of the physical world



What do EPC and RFID do?

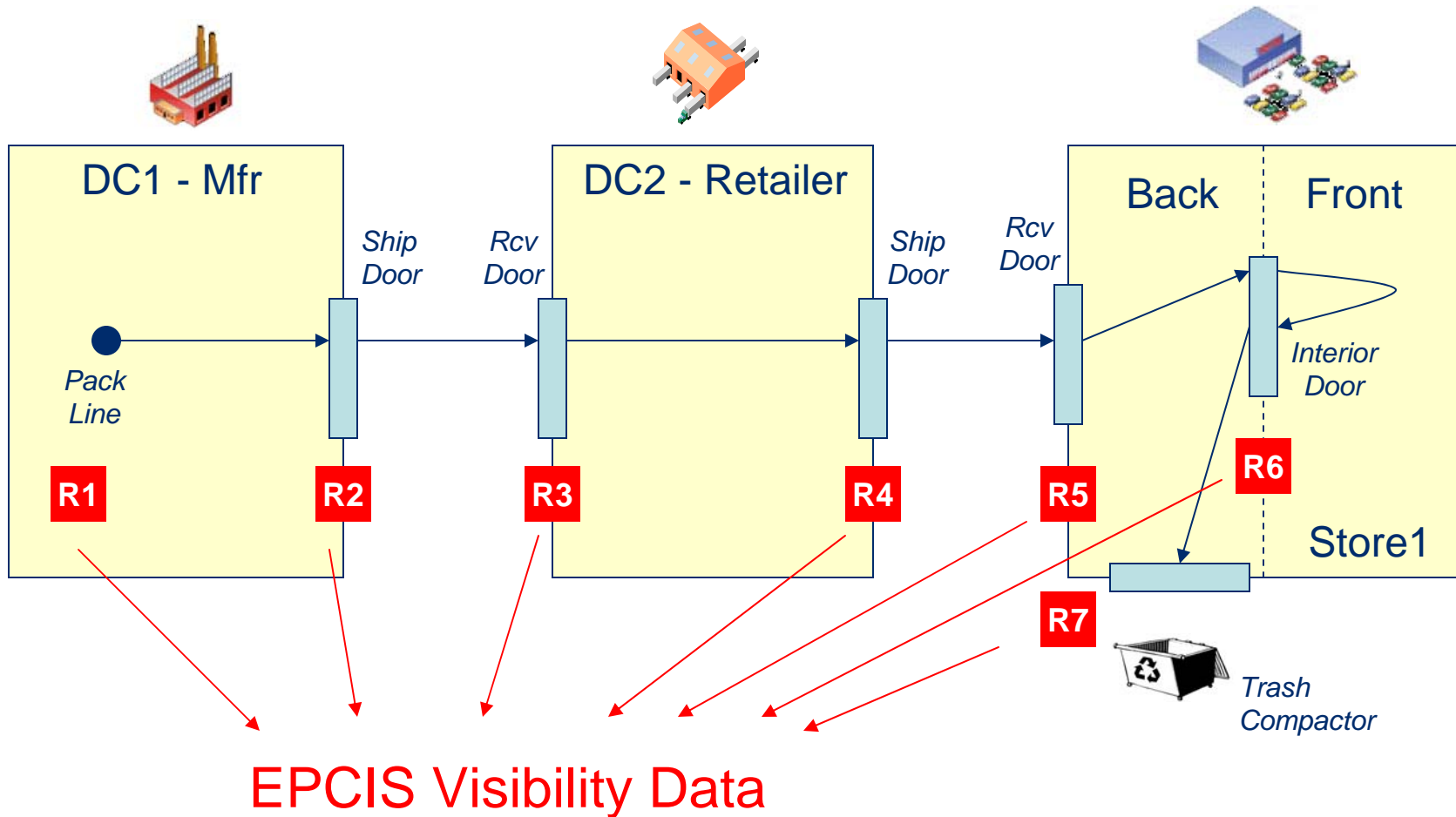


- No EPC/RFID → No Visibility
- EPC uniquely identifies the asset
- RFID Tag encodes the EPC
- RFID Reader senses presence of asset (no human intervention)
- Information systems now have visibility data
- Business can take action



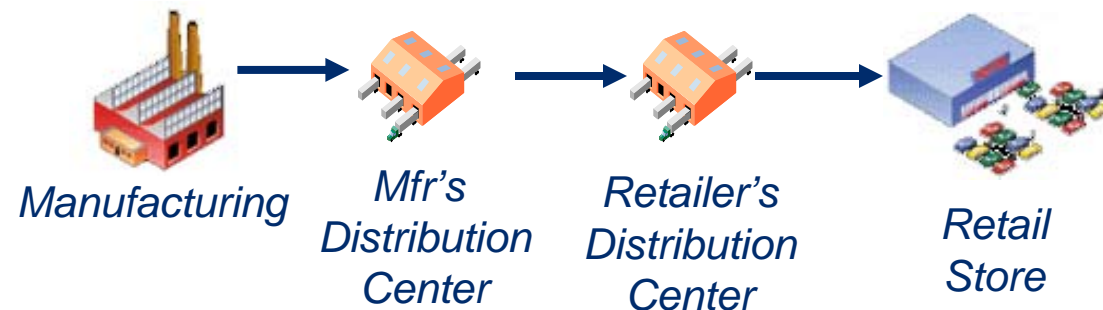


Visibility in the Supply Chain





Application: Retail Promotions

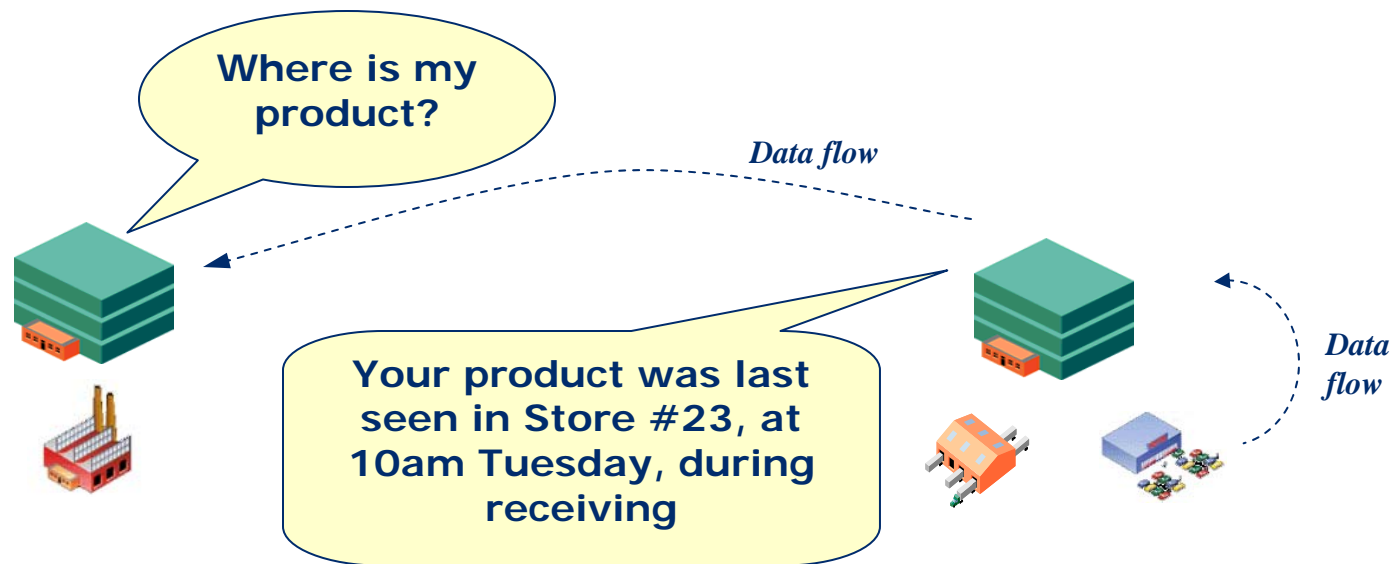


- Give unique EPC to each case of promotion-packaged item, on RFID tag
- Equip facilities with RFID readers: loading dock doors, trucks, retail back-room door, dumpster
- Retailer and Manufacturer share visibility data
- Can now measure & drive promotion:
 - Timeliness: is promotional packaging reaching consumer in time?
 - Effectiveness: is promotional item selling better?



Visibility Sharing using EPCIS

- Many apps requires **sharing** of visibility data.

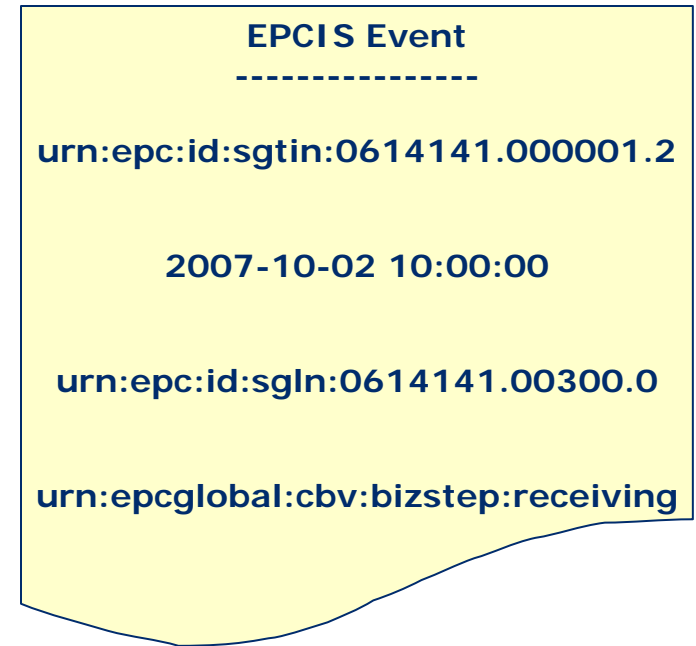


- EPC Information Services (**EPCIS**) provides the **standard** way to share visibility data.



What is EPCIS Visibility Data?

- EPCIS Data consists of **events**, each of which records something that happened in the real world.
- Often, though not necessarily, triggered by reading an RFID tag.
- An event has four dimensions:
 - **What:** what physical objects were involved (EPC or other identifier)
 - **When:** when the event took place (timestamp)
 - **Where:** where the event took place (location identifier)
 - **Why:** what business process step was being carried out





EPCIS Event in XML

<ObjectEvent> ***Event type***

<eventTime>2007-11-06T15:00:02.449Z</eventTime>
<eventTimeZoneOffset>-05:00</eventTimeZoneOffset>

When

<epcList>
 <epc>urn:epc:id:sgtin:0614141.000001.2</epc>
</epcList>

What

<action>OBSERVE</action>
<bizStep>urn:epcglobal:cbv:bizstep:shipping</bizStep>

Why

<readPoint><id>urn:epc:id:sgln:0614141.00300.0</id></readPoint>
<bizLocation><id>urn:epc:id:sgln:061414100300.0</id></bizLocation>

Where

</ObjectEvent>



EPCIS Events in Tabular Form

EPC	Time	Biz Loc	Store	Sub loc	Biz Step	Disposition
urn:epc:id:sgtin:061414.112345.400	2008-10-15 10:12:03Z	urn:epc:id:sgln:0614141.12345.1523	Store 23	Back room	Receiving	Sellable, not accessible
urn:epc:id:sgtin:061414.112345.401	2008-10-15 10:12:04Z	urn:epc:id:sgln:0614141.12345.1523	Store 23	Back room	Receiving	Sellable, not accessible
urn:epc:id:sgtin:061414.098765.24	2008-10-15 11:12:03Z	urn:epc:id:sgln:0614141.12345.153	Store 23	Sale Area	Stocking	Sellable, accessible
urn:epc:id:sgtin:061414.112345.400	2008-10-16 12:12:03Z	urn:epc:id:sgln:0614141.12345.153	Store 23	Sale Area	Stocking	Sellable, accessible
...

What

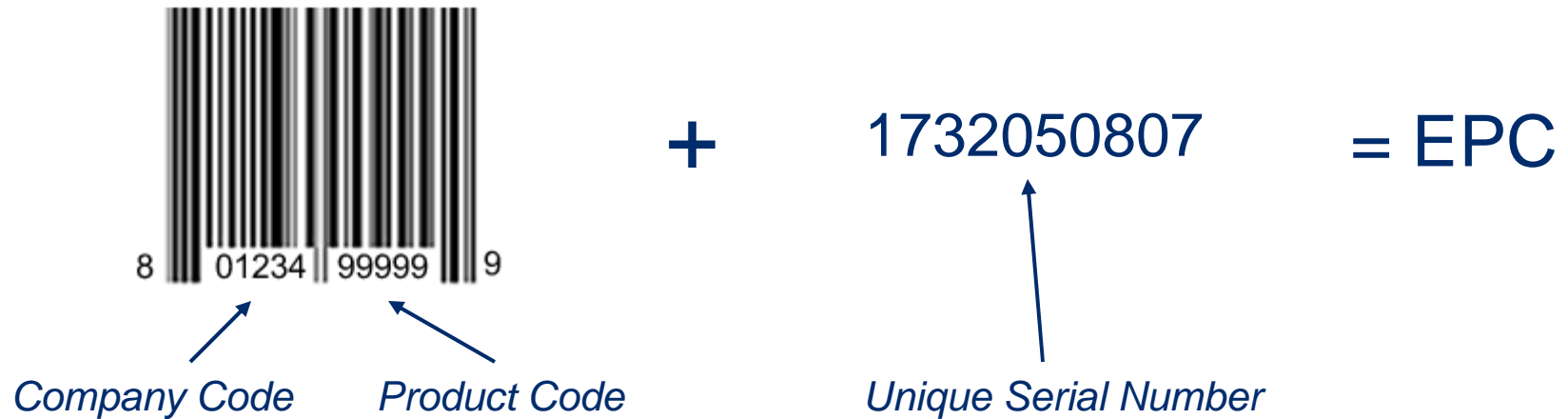
When

Where

Why



The **What** Dimension: the EPC



- Looks like this:
`urn:epc:id:sgtin:0801234.099999.1732050807`
- Tells you:
 - What product (GTIN / UPC)
 - What specific instance (serial number)

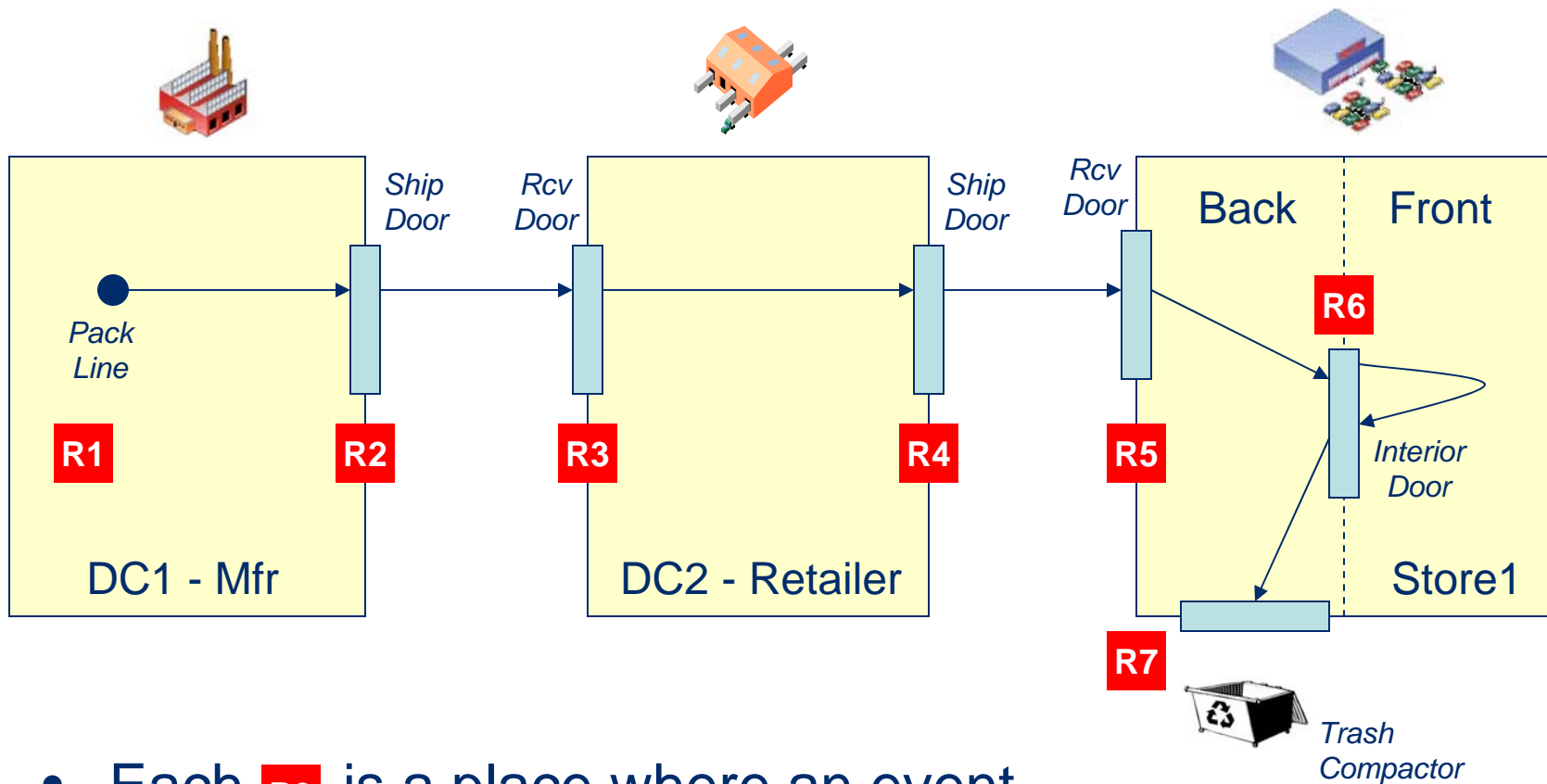


The **What** Dimension: the EPC

- Having a unique EPC for each product instance gives you **new information**
- The **specific** instance (serial number) of a product lets you:
 - Measure transit time from the factory to the store sales floor
 - Know when a specific lot has reached the store
 - Know if exactly the same things you shipped were received
 - Learn how retailers cycle inventory
 - Trace history of a product as it moves through supply chain
 - Ensure that every single recalled product is returned



The **Where** Dimension



- Each **R3** is a place where an event can occur



The **Where** Dimension

- The data contains a **location identifier**:
`urn:epc:id:sgln:0614141.12345.4153`
- You can look this up in Master Data to get:
 - The **type** of site (DC, store, etc)
 - **Which** store, DC, or other facility
 - **Area** within facility (e.g. for a store: front room, back room, etc)
 - Sometimes even more precise information:
 - End cap vs shelf
 - Upper “steel” storage vs lower stock area (warehouse-style store)
 - Which department (grocery, sporting goods, etc)
 - Warehouse bin number



The **Where** Dimension

- Having precise location gives you **new information**
 - When does product enter the sales area?
 - Was it stocked in the right part of the store?
 - At what storage location is a given lot being held?
 - How many products were brought to the dumpster?
 - Did the products show up at the right store?
 - Did they show up at all?
 - Where do I go to quickly find a missing asset?



The **Why** Dimension

- **Business Step:** what was happening to the product when the EPCIS event was generated?
 - Shipping
 - Receiving
 - Accepting
 - Stocking
 - + 27 others
- **Disposition:** what is true about the product afterwards?
 - In Transit
 - Sellable, not accessible (e.g., in back room)
 - Sellable, accessible
 - Non-sellable, expired
 - Sold
 - + 14 others

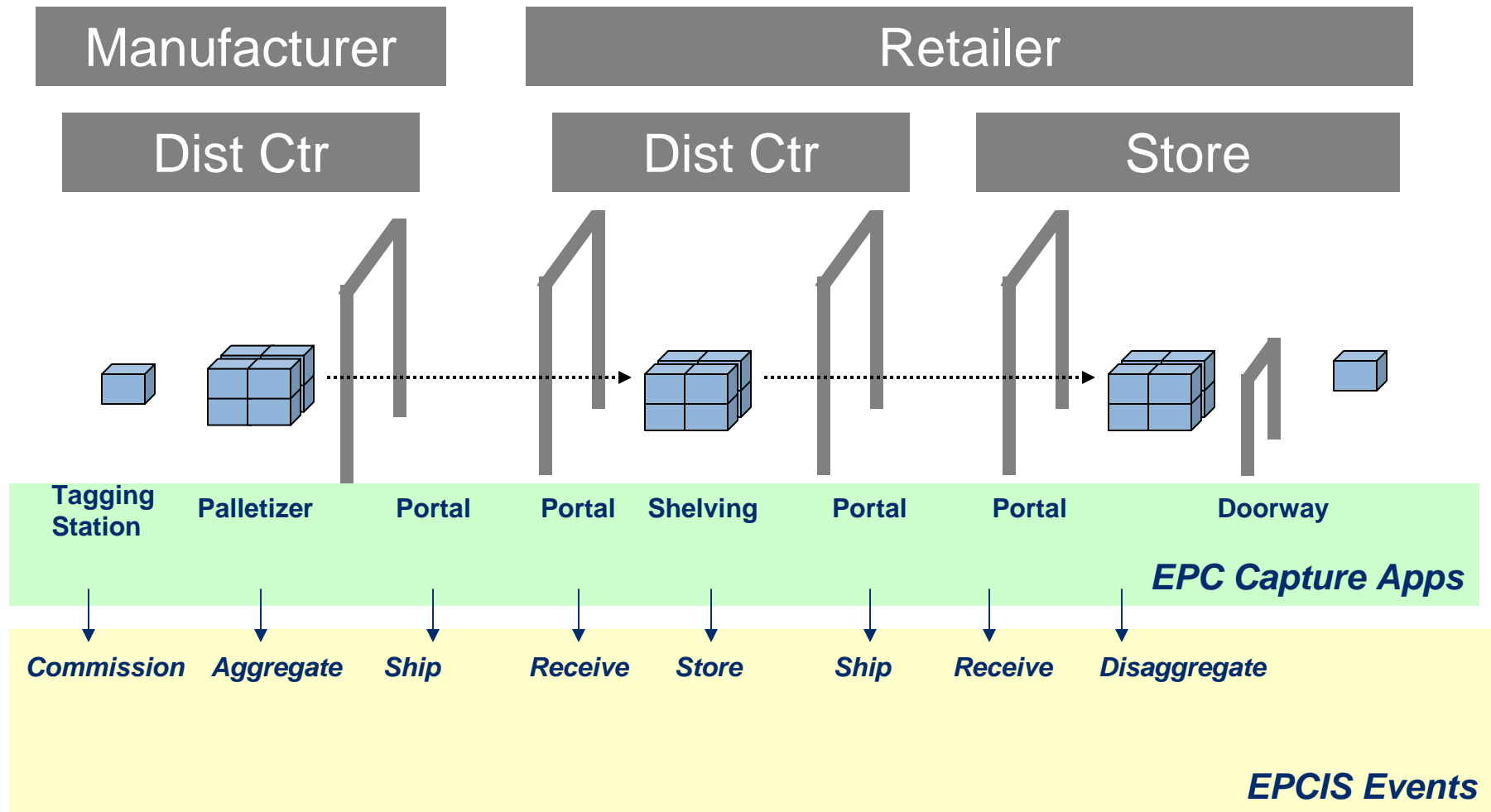


The **Why** Dimension

- Business Step and Disposition make it easy to process the data
 - Can easily correlate to business processes (shipping, receiving, ...)
 - No need to understand **how** the retailer collected the data
 - Search and analysis simplified

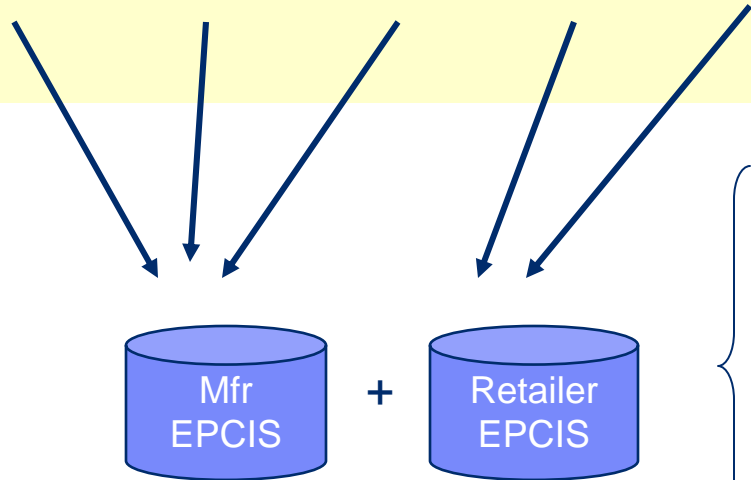
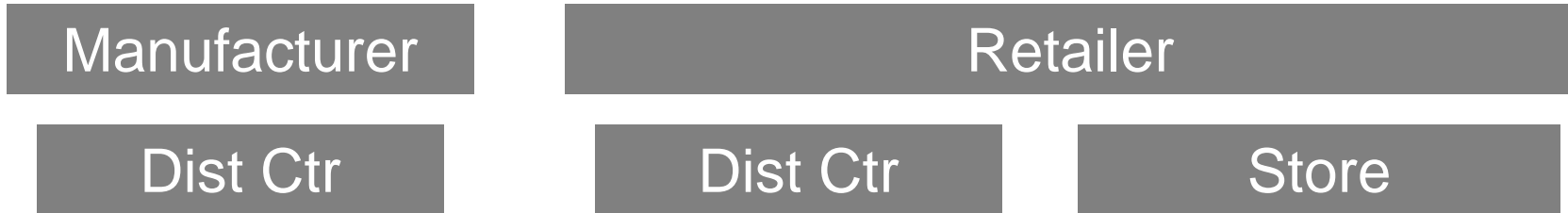


EPCIS Data Across the Supply Chain





EPCIS Data Across the Supply Chain



Case #123 of Cherry Hydro		
2/5 1:23pm	Mfr DC #2	Shipping
2/7 4:28am	Retail Store #5 back room	Receiving
2/8 5:23pm	Retail Store #5 front room	Observe



EPCIS Data Sharing

- How do you get data from across the supply chain?
 1. Capture your own EPCIS data
 2. Find other parties who also have data
 3. Exchange data point-to-point using EPCIS
- EPCIS is not a single giant database:
Each party keeps its own data, and shares it only with whom it chooses



Finding EPCIS Data

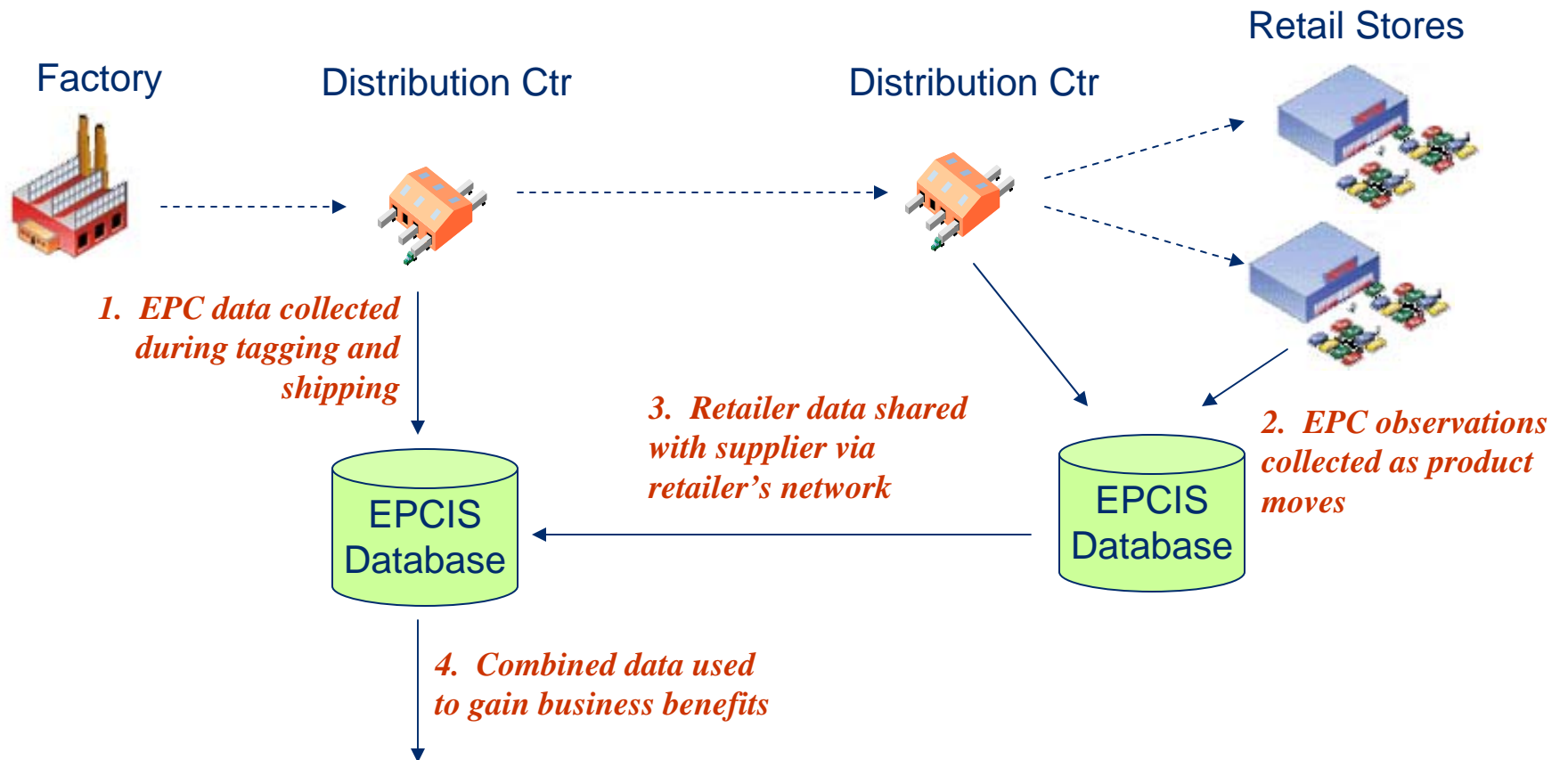
- How do you find other parties who have data of interest? Three options:
- Pre-arrangement
 - with your known trading partners
- Object Name Service (ONS)
 - finds the party that commissioned a given EPC
- Discovery Services
 - finds all data in the supply chain
 - still under development



Data Sharing with Known Trading Partners

Supplier

Retailer





Uses for Visibility Data

- Many business questions need visibility:
 - Has my product reached the consumer?
 - Was my shipment delivered?
 - Is my product authentic?
 - Where are the missing products?
 - Where are the trouble spots in the supply chain?
 - How can I reduce inventory?
 - Am I making best use of my fleet?



Top CPG Use Cases Today

- Sales Promotions / New Product Introduction
 - Are products getting to the right place at the right time?
- Recall execution
 - Where are the products that need recall?
 - Have they been removed?
- Delivery Execution
 - Did products actually arrive?
 - Were they checked in quickly?
- Sales Floor Visibility



Promotion Execution Errors



Set-up OK



Left in Back



Worked into Riser



Worked into Side Shelf



Promotional Execution

Widget PDQ Lift Comparison	# of Stores		Average Weekly POS (\$/Store)				
			Before	During	Lift	After	Lift
Displays Set-up	68	45%	\$11.6	\$14.1	22%	\$12.3	6%
— Displays Set-up Early	14	9%	\$12.4	\$14.1	14%	\$13.1	6%
— Displays Set-up On-Time	43	29%	\$10.7	\$13.9	30%	\$11.6	8%
— Displays Set-up Late	11	7%	\$14.1	\$14.9	6%	\$13.8	-2%
Worked In / No Display	55	37%	\$13.2	\$13.7	4%	\$13.3	1%
Left in Backroom	15	10%	\$12.7	\$12.5	-2%	\$12.4	-2%
No Display Reads at the Store	12	8%	\$12.1	\$13.2	9%	\$12.5	3%
RFID Enabled Stores	150	25%	\$12.3	\$13.7	11%	\$12.7	3%
Non-RFID Enabled Stores	450	75%	\$12.5	\$13.6	9%	\$12.7	2%
Summary for All Stores	600	100%	\$12.5	\$13.6	9%	\$12.7	2%

- During and after promotions, visibility data can help identify:
 - What was the lost revenue opportunity due to poor execution by the stores?
 - Which stores repeatedly discard displays and simply work-in the product?
 - What best characterizes the highest lift stores? And the worst?
 - What type of stores (format, revenue) were most likely to set-up the displays on-time? What type of stores were most likely to work-in product?
 - What role did beginning on-hand inventory play in store execution?



Top Pharma Use Cases

- Forward Logistics
 - Detailed trace of product whereabouts
 - Full case → tote → each
 - Drop ship, repackaging, kitting
- Reverse Logistics
 - Returns, recalls, withdrawals
- Product Authenticity
 - Did product take an authorized path through the supply chain?
 - (if not, possible counterfeit)
 - Any unexplained gaps in custody during which product may have been tampered?
 - Are products received identical to those that were shipped?



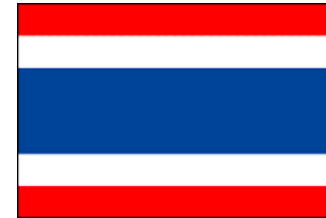
Food Safety

- Food-borne illness a major problem worldwide:
 - In US alone, \$152 billion / year in losses
 - 76 million cases of illness, 5000 deaths
- Requirements:
 - **Trace** path of food in supply chain
 - When contamination discovered, **track** and remove the bad lots
 - **Record** critical information:
 - Farm of origin, date of harvest, temperature during shipping, etc



Food Safety – Case Study

- March 26, 2010: Thailand gov't announces program to trace agricultural products from farms to store shelves
- Unique serialization using bar code and RFID
- Data shared with trading partners using **EPCIS**





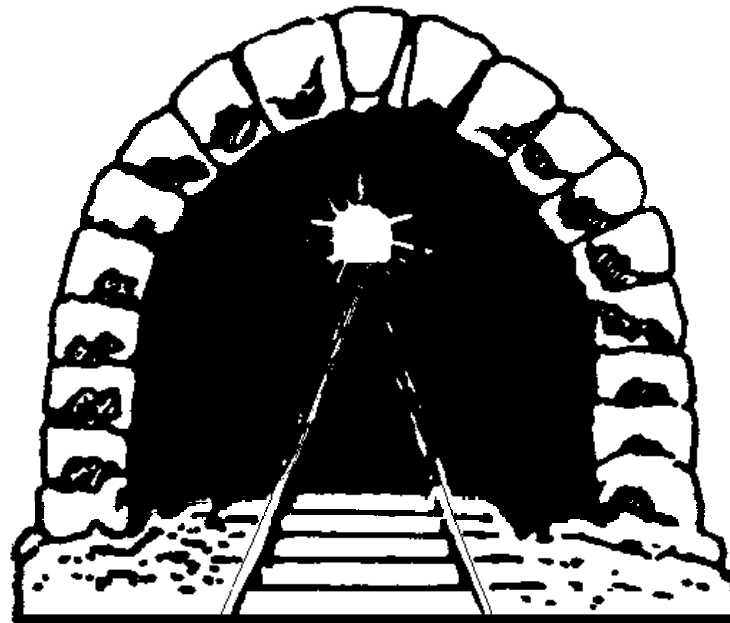
Other Industries

- Transportation and Logistics
 - Full visibility through complex trans-oceanic logistics process
- Defense
 - Tracking repairable parts between active supply chain and repair depots
- Airlines
 - Tracking baggage Unit Load Devices across airlines
- Automotive
 - Tracking tires through supply chain, retreading
 - Tracking of material handling conveyances



The Value of Visibility

- Supply Chains can be like a dark tunnel...



- Visibility information helps you see inside!



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Thank You