



# Traceability through IBM Sensor Solutions

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# Delivering Business *Visibility*

## Real World Visibility

Identify Situations



## Business Instrumentation

Visualize & Tune



Instrumentation: the branch of science that deals with measurement and control in order to increase efficiency..

Wikipedia

## Process Innovation

What, When, Where  
Why, How to Respond



# Sensor Solutions: Created from a pallet of IBM software components

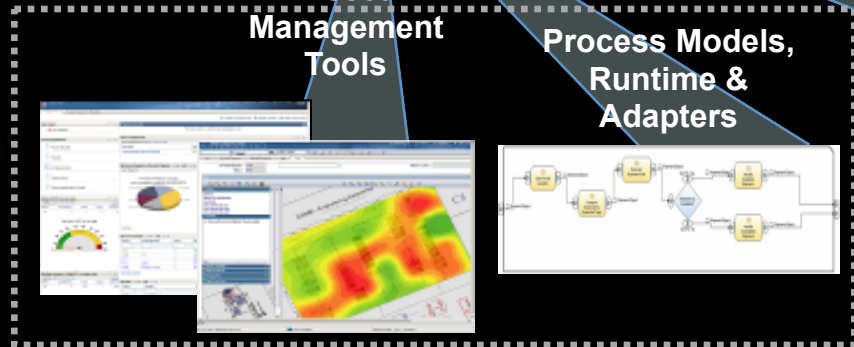
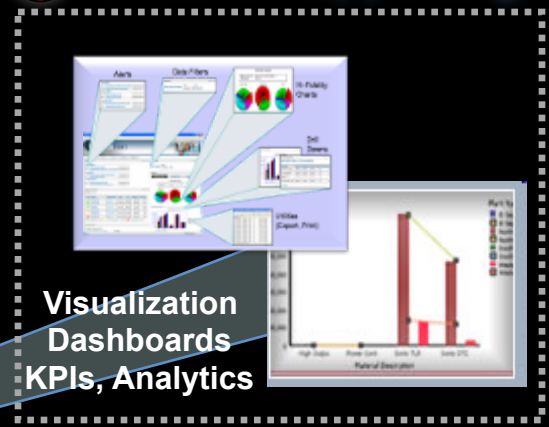
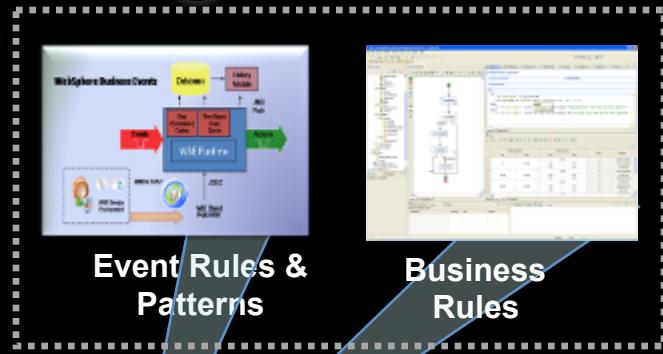
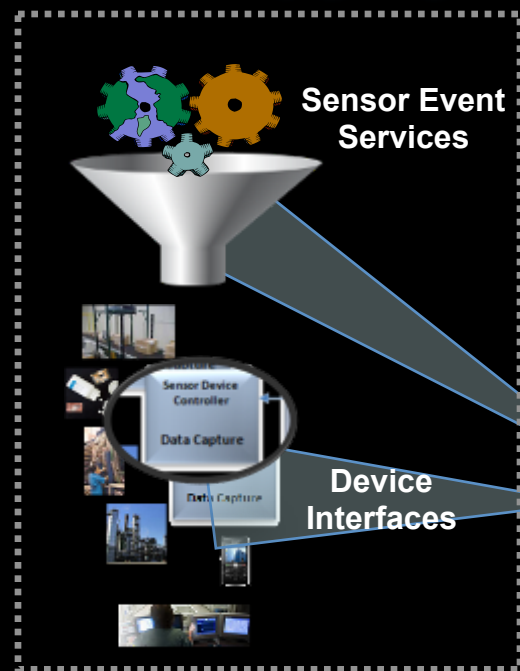
## 1. What is really going on?

## 2. When to act?

## 3. What is happening?

## 4. What to do?

## 5. How to do it?



## What's the RFID Advantage over Barcodes?

	Barcode / UPC	RFID Tag
Efficiency	Ability to read one tag at a time (line of sight required)	Ability to read multiple tags simultaneously (no line of sight required). Minimization, reduction, elimination of human intervention that can lead to labor and cost savings
Dependability	Labels easily damaged	Tags less susceptible to damage. Simultaneous reading of multiple tags, including high performance in harsh environments
Data Capacity	Limited amount of data can be assigned	Significantly higher data capacity to capture detailed information about product
Flexibility	Static information	Potential for read/write capability, making tags reusable

Sources: The RFID Aerospace and Defense Market, Supply-Chain and Asset-Management Application Market Opportunities, ABI Research 2006

# Smarter initiatives creating opportunities ...



smarter safe  
pharmaceuticals



smarter solutions  
for retail



smarter supply  
chains



smarter  
food



smarter  
manufacturing



smarter industrial  
operations



smarter  
data center



smarter  
healthcare



smarter  
transportation



smarter  
traffic



smarter water  
management

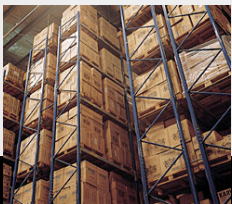


smarter  
cities

# Traceability can solve business challenges in multiple areas

## Supply Chain Visibility

- Cold Chain Management
- Food Traceability
- Raw Material Tracking
- Parts Replacement
- Promotions Tracking
- Shipment Verification
- Work in Progress Visibility



## Reverse Logistics

- Efficient Returns
- Targeted Recall
- Chargeback Resolution



## Asset Visibility

- Item/Asset Tracking
- Inventory Counting
- Returnable Container Management



## Supply Chain Integrity

- Diversion Detection
- Electronic Pedigree
- Product Authentication



## IBM Solution for Pharma Track & Trace

## The Business Drivers for Supply Chain Visibility of Pharmaceuticals



**8-10% of worldwide drug supply is counterfeit  
→ \$7.5 billion lost per year by 2010**



**Manufacturers carry up to 10% in safety stock**



**4.5% of revenue is lost due to supply chain inefficiencies.**



## AmerisourceBergen: One of the “Big Three” drug distributors in USA

### Pharmaceutical Track & Trace

#### Challenge

- Compliance with US state (CA) legislation requiring exchange of electronic drug history information
- Leverage compliance infrastructure to enable use cases that improve business processes (returns, verification, etc.)

#### Solution

- **Foundation for Compliance:** Capability to dramatically improve supply chain management, enabling product authentication and diversion detection.
- **IBM Components:** WebSphere Sensor Event Server V6.0, InfoSphere Traceability Server V1.1, ePedigree Feature, Software Group Lab Services: enterprise integration, and testing



#### Benefits

- ✓ Compliant with the California mandates and therefore able to create and receive an electronic certificate of authenticity for every drug that passes through its distribution centers, including a complete chain of custody.
- ✓ Able to offer value-added, compliance-driven services to its customers.
- ✓ Able to utilize serialized product movement data to address business problems such as automating charge back resolution, improving product expiration management and streamlining returns.

# implanet Logistics Flow for Automatic Replenishment with SAP ERP

**Nurses**

Validation and automatic transmission of orders for restocking

**Operating rooms**

Data collection: prostheses, instruments, patient



Prostheses: stock out

**implanet**

Order receipt

Orders confirmation

Preparation et packing orders -Stick RFID label including Client and Order numbers

Final control with RFID tunnel

**Stock**

Reception

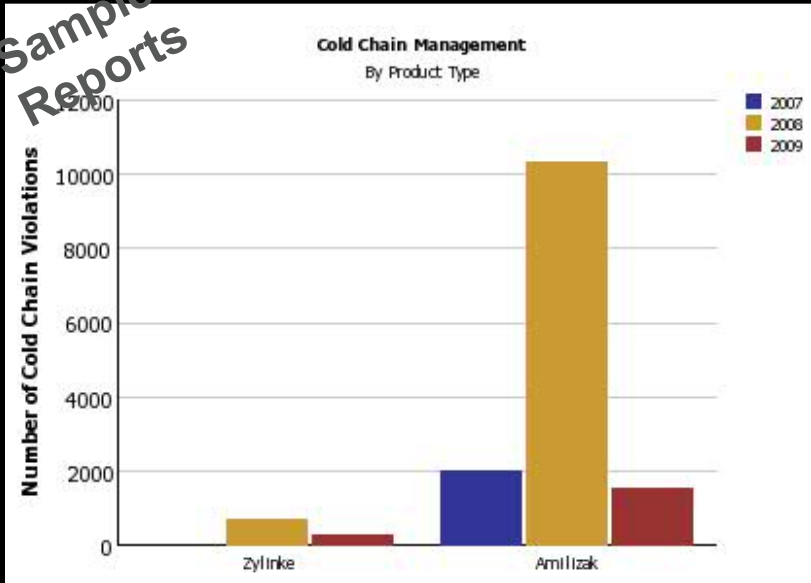


# Cold Chain Management in the Pharmaceutical Industry

## Getting drugs to market while maintaining proper temperature



Sample Reports



**Shipper Perspective**

	Average Cold Chain Violations		
	2007	2008	2009
<u>Retailer 8</u>	★	★	★
<u>Retailer 9</u>	★	★	★
<u>Wholesaler 5</u>	■	■	★
<u>Wholesaler 6</u>	★	★	★

## Other Examples of Traceability at Work in Pharma - Targeted Recalls

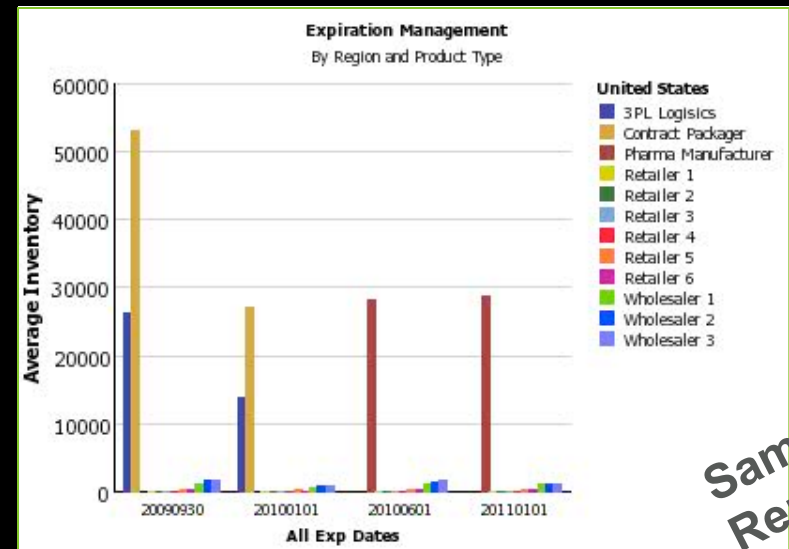
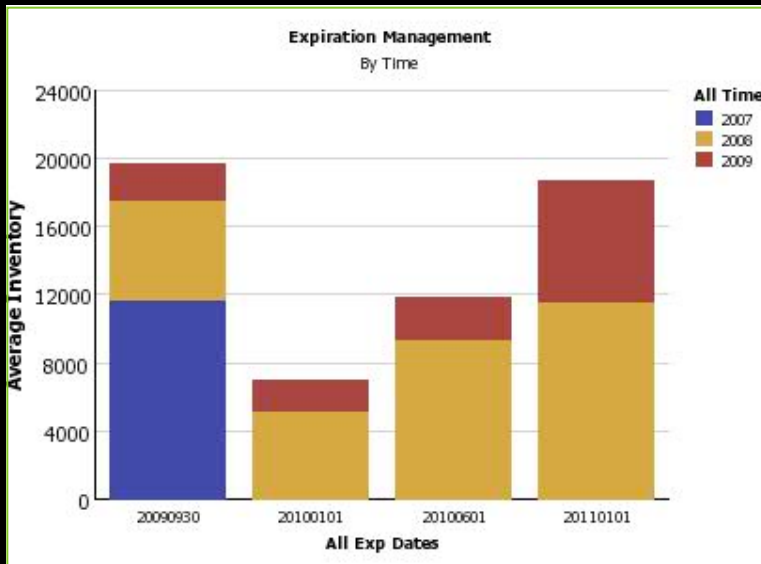
### Efficiently remove unsafe drugs from the market

				Number Shipped	Number Returned	Number Unaccounted For	% of Number Unaccounted For to Total Shipped
<u>2008</u>	<u>USA: Pharma Manufacturer</u>	Amilizak	7982	202,249	0	202,249	100%
	<u>USA: Retailer 1</u>	Amilizak	7982	594	12	582	98%
	<u>USA: Retailer 2</u>	Amilizak	7982	656	11	645	98%
	<u>USA: Retailer 3</u>	Amilizak	7982	720	14	706	98%
	<u>USA: Retailer 4</u>	Amilizak	7982	1,221	11	1,210	99%
	<u>USA: Retailer 5</u>	Amilizak	7982	5,219	134	5,085	97%
	<u>USA: Retailer 6</u>	Amilizak	7982	4,774	134	4,640	97%
	<u>USA: Wholesaler 1</u>	Amilizak	7982	6,010	418	5,592	93%
	<u>USA: Wholesaler 2</u>	Amilizak	7982	12,741	969	11,772	92%
	<u>USA: Wholesaler 3</u>	Amilizak	7982	14,666	1,215	13,451	92%
<u>2009</u>	<u>USA: Pharma Manufacturer</u>	Amilizak	7982	10,914	0	10,914	100%
	<u>USA: Retailer 1</u>	Amilizak	7982	1,363	52	1,311	96%
	<u>USA: Retailer 2</u>	Amilizak	7982	1,260	34	1,226	97%
	<u>USA: Retailer 3</u>	Amilizak	7982	1,406	51	1,355	96%
	<u>USA: Retailer 4</u>	Amilizak	7982	1,010	30	980	97%
	<u>USA: Retailer 5</u>	Amilizak	7982	6,795	301	6,494	96%
	<u>USA: Retailer 6</u>	Amilizak	7982	5,360	262	5,098	95%
	<u>USA: Wholesaler 1</u>	Amilizak	7982	4,919	640	4,279	87%
	<u>USA: Wholesaler 2</u>	Amilizak	7982	9,182	1,099	8,083	88%
	<u>USA: Wholesaler 3</u>	Amilizak	7982	9,059	1,469	7,590	84%

Sample Reports

# Expiration Management

Efficiently remove expired drugs from the supply chain



Sample Reports

# Food Traceability

# Matiq

## From Farm to Fork Traceability



Increases consumer confidence in the quality of pork they purchase

### Matiq

IT subsidiary of Nortura, Norway's largest food producer, uses IBM's solution to deliver the country's first farm to fork traceability

# Consumer Products Company

## Perishable Goods Tracking



**Goal: Reduce product waste by 10%**

**Perishable Goods Wholesaler**  
Food wholesaler uses IBM's solution to reduce product waste caused by temperature-related problems along the supply chain during transport and distribution.



# Metro

## Promotions Tracking with RFID



- Big parts of the **common turnover** of suppliers and retailers are realized in special promotions
- Extraordinary product presentation with displays
- Goals of Promotion Tracking
  - **Tracking and controlling** of the operative promotion process along the complete supply chain
  - **Optimize availability** of the display on the sales floor during the promotion
  - Finding and **reducing** supply chain inefficiencies
- Not too early and not too late...



# Returnable Container Management

# IBM Returnable Container Management solution

## Optimize the supply chain to gain efficiencies

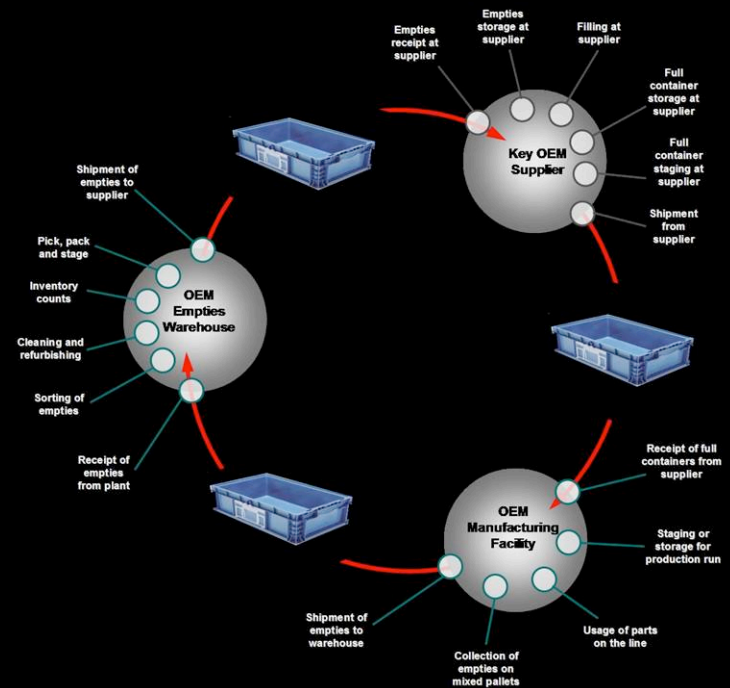
### The Power of Analytics

Determine how effective suppliers are in meeting target cycle times

Investigate WHY certain suppliers consistently exceed targeted container cycles

Understand how effective containers are utilized throughout their lifetimes.

Identify WHO is in most violation of targeted cycle times and investigate WHY



## German Auto Manufacturer Saves On Replacements Costs

Hundreds of thousands of containers in a complex supply chain.

Each new container costs about \$500.



**40%**  
reduction in  
container inventory

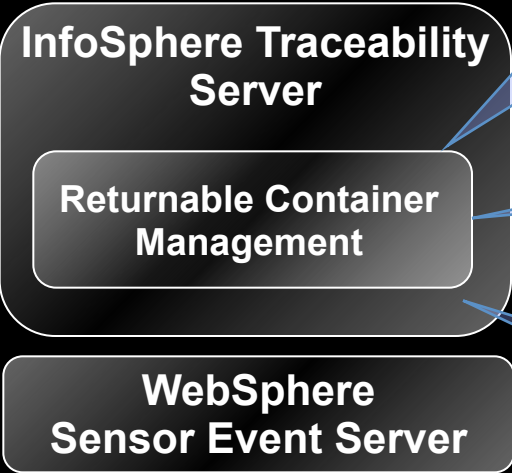
**German Auto Manufacturer**  
Reduces returnable container inventory by 40% by using RFID-based traceability to gain full visibility into supply chain

# InfoSphere Traceability Server

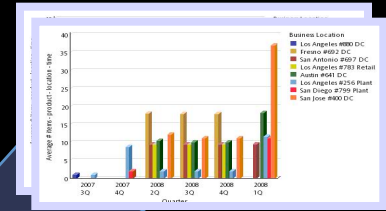
## Returnable Container Management

### Business Drivers

- Large and Aging Inventory
- Poor Utilization
- High Container Shrink
- High Substitution and Expedited Shipping Costs



### Dashboards



### Reports & Alerts

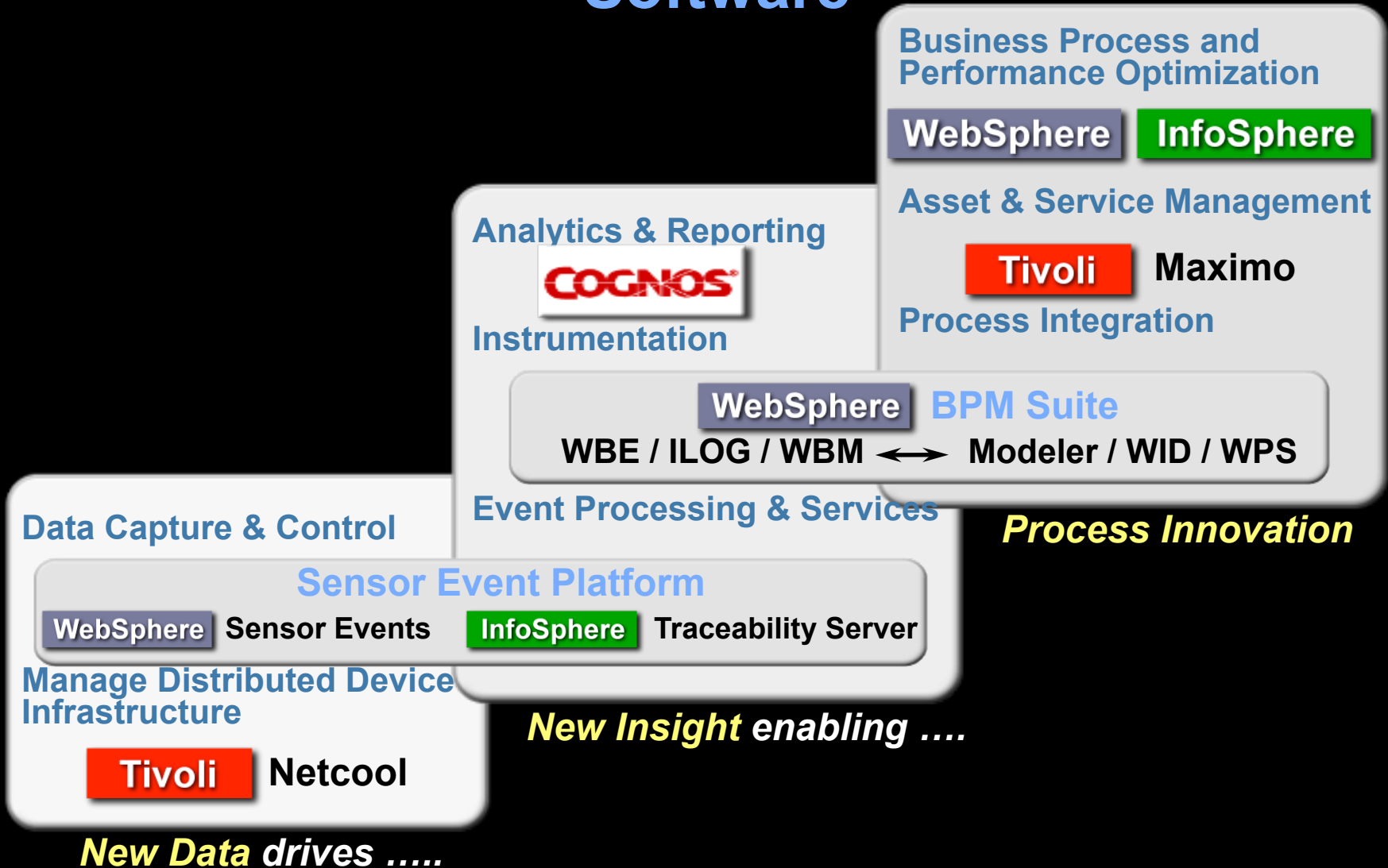
Container History Report

Event Time	Company	Business Location	Status	Business Dept	Disposition
Mar 15, 2009 9:03:37 PM	Manufacturer 1	San Diego #759 Plant	Commissioning 3	Commissioning	Active
Mar 16, 2009 10:32:01 AM	Manufacturer 1	San Diego #759 Plant	Storage 2	Storage	Substituted - In Storage
Mar 22, 2009 4:54:01 AM	Manufacturer 1	San Diego #759 Plant	Pack	Packing	Drumcases
Mar 24, 2009 10:22:01 AM	Manufacturer 1	San Diego #759 Plant	Shipping/Doc Center 2	Shipping	In Transit
Mar 27, 2009 5:13:37 PM	Manufacturer 1	San Jose #800 DC	Shipping/Doc Center 1	Shipping	Drumcases
Mar 28, 2009 10:22:01 AM	Manufacturer 1	San Jose #800 DC	Storage 2	Storage	Substituted - In Storage
Apr 7, 2009 4:58:49 PM	Manufacturer 1	San Jose #800 DC	Shipping/Doc Center 2	Shipping	In Transit
Apr 8, 2009 7:18:01 PM	Manufacturer 1	San Jose #800 DC	Pack 1	Packing	Drumcases
Apr 12, 2009 10:22:01 AM	Distribution Center 1	Fresno #802 DC	Shipping	Shipping	Drumcases
Apr 12, 2009 10:12:34 AM	Distribution Center 1	Fresno #802 DC	Shipping	Shipping	Drumcases
Apr 15, 2009 12:06:11 PM	Manufacturer 1	Austin #641 DC	Shipping/Doc Center 2	Shipping	Drumcases
Apr 16, 2009 #10:22:01 AM	Manufacturer 1	Austin #641 DC	Controlled Distribution Storage	Storage	Substituted - In Storage
Apr 21, 2009 11:24:47 AM	Manufacturer 1	Austin #641 DC	Pack 1	Packing	Drumcases
Apr 23, 2009 #10:12:34 AM	Manufacturer 1	Austin #641 DC	Shipping/Doc Center 1	Shipping	In Transit
Apr 30, 2009 11:02:34 AM	End User 1	San Antonio #897 Retail	Shipping	Shipping	Drumcases

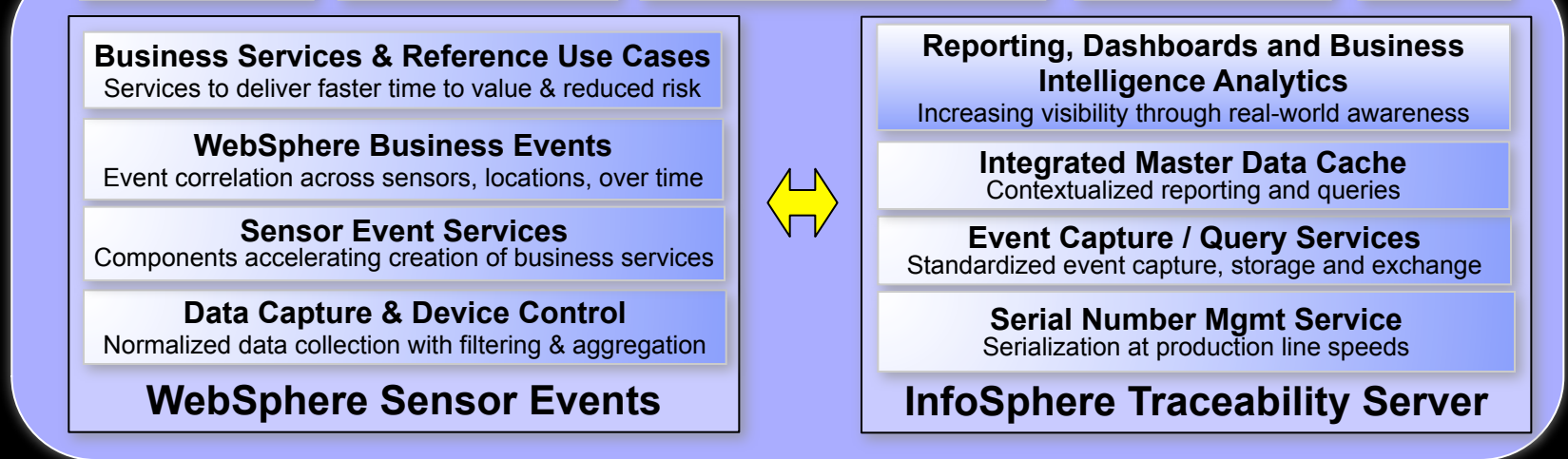
### Scorecards

- Container Inventory
- Container Losses
- Cycle Times
- Aged Inventory

# Visibility and Process Innovation through IBM Software



# Sensor Solutions Architecture



SOA Foundation

Sensor Event Platform

Multi-technology data capture



# Additional Information

## Websites

IBM InfoSphere Traceability Server

<http://www.ibm.com/software/data/infosphere/traceability-server/>

IBM Sensor Solutions

<http://www.ibm.com/solutions/sensors/us/detail/solution/W693490T04462S08.html>

## Whitepapers & Collateral

IBM InfoSphere Traceability Server Data Sheet

[http://www.ibm.com/software/sw-library/en\\_US/detail/C924949R74553T28.html](http://www.ibm.com/software/sw-library/en_US/detail/C924949R74553T28.html)

Returnable Container Management: Optimizing Logistics for Manufacturers

[http://www.ibm.com/software/sw-library/en\\_US/detail/C924949R74553T28.html](http://www.ibm.com/software/sw-library/en_US/detail/C924949R74553T28.html)

RFID-Enabled Returnable Container Management: Solution to a chronic and wasteful automotive industry problem

[http://www.ibm.com/software/sw-library/en\\_US/detail/C924949R74553T28.html](http://www.ibm.com/software/sw-library/en_US/detail/C924949R74553T28.html)

**IBM Global Business Services**

**RFID-enabled returnable container management:**  
Solution to a chronic and wasteful automotive industry problem  
*Chris Handberg and Mahesh Laxari*

**Returnable container management: Optimizing logistics for manufacturers**

**Highlights**

- Improves turnaround time and reduces losses of automotive containers in the automotive industry
- Provides container tracking through RFID technology
- Optimizes investment in containers through a combination of process and organizational change and a corresponding IT solution
- Benefits all participants in the container network due to improved visibility and elasticity of containers

The automotive industry has long used standardized, reusable containers to simplify the transport of parts and materials from a supplier to an original equipment manufacturer (OEM), and between OEM plants. The containers, which come in a wide variety of sizes, are provided to supply chain partners—often free of charge—by the manufacturer.

This arrangement represents an excellent example of waste and cost reduction, because the containers are durable and reusable.

In addition, the rise of globalization is driving the increased use of (and investment in) containers because of longer turnaround times caused by reliance on remotely located suppliers; additional containers need to be fed into the network to ensure an adequate supply.

Ideally, there should be little cost for the OEM associated with them beyond initial purchase: containers may need routine maintenance and are replaced as they wear out in the normal course of events. For the suppliers, there should be no cost at all. By driving waste and cost out of the system, product prices can be kept low and competitiveness maintained.

But the reality is somewhat different. Containers can get lost, stolen, damaged or soiled, requiring replacement, repair or cleaning. Normally, OEMs charge their costs to the suppliers, shippers or business units that are at fault for these losses. Yet, it is often challenging or impossible to do so because of the difficulty associated with tracking the location and status of the containers.

**IBM**



## How do I get started? Here are some options

- Aid with small study project (business and technical)  
Proof of Concept or pilot project/phase zero deployment ?  
You can start small.  
Vertical or horizontal deployment ?

- Existing business process/flow analysis. Identify biggest problems.
- Link to company business strategy. e.g. new services
- Business benefits analysis, including sharing new insights across other processes.
- Quantify cost reductions, process optimization, potential new revenue, competitive advantage
- Build solution.
- Estimate costs, technical , organisational, integration, training, project management, etc.
- Define project roadmap.
- Construct business case.