

**IBM solutions for the pharmaceutical industry**  
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**IBM** **Information Management** software

**Visibility, compliance and  
collaboration through serialization:  
IBM solutions for the  
pharmaceutical industry**

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## Introduction

Pharmaceutical companies face multiple challenges each year in the form of supply chain security lapses, counterfeiting and stringent regulations. Burdensome logistics, excess inventory and safety stock only add to the complexity. Overcoming these challenges starts with establishing secure product track and trace capabilities among trading partners throughout the supply chain.

EPCglobal, an open standards organization, leads the development of the Electronic Product Code™ (EPC) standard promoting the use of Radio Frequency Identification (RFID) to boost trading partner networks. Based on a layered Service Oriented Architecture (SOA), EPCglobal Electronic Product Code Information Services (EPCIS) provides a standard and secure way to communicate data created by sensors such as RFID tags and tie it to existing business information and trading partners.

Built in conjunction with pharmaceutical customers, IBM WebSphere® RFID Information Center (RFIDIC) is a complete implementation of EPCglobal spec for EPCIS. Drawing on strict standards adherence, EPCIS interoperability and IBM leadership in B2B connectivity, the solution offers high-performance serialization capabilities, along with high data security that can interoperate with SAP or other legacy business systems.

This white paper discusses the opportunities in the sensor and serialization space, and outlines the features and capabilities IBM WebSphere RFID Information Center brings, including the ability to:

- *Help lower overall total cost of ownership by easing compliance with evolving EPCglobal EPCIS and Data Exchange standards.*
- *Augment supply chain visibility.*
- *Enable secure trading partner collaboration.*
- *Meet immediate and future product serialization needs through enterprise-class robustness, scalability and performance capabilities.*
- *Leverage granular, high-volume sensor data with existing technology infrastructure, such as SAP Enterprise Resource Planning (ERP) solutions.*

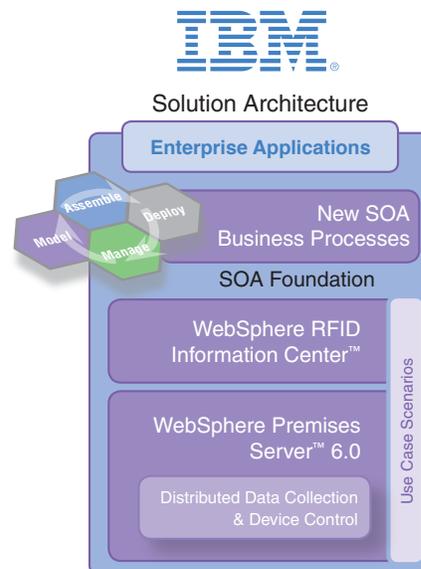
**IBM WebSphere RFID Information Center overview**

First released in December 2006, WebSphere RFID Information Center V1.0 offers an open standards J2EE™ and J2ME™ technology-based application environment that gives small, mid-sized and large businesses the flexibility to integrate information with external middleware and ERP applications, including SAP. RFIDIC is highly configurable and scalable, and is designed to scale to unit data volume and can call to hundreds of millions of items.

Built on a Service Oriented Architecture (SOA) platform to enable flexible business process innovation, the SOA foundation provides a solid base for new business process development to exploit sensor insights (i.e. 2D barcode or RFID). It offers flexible integration with legacy applications, as well as composite applications for new capabilities.

SOA implementation patterns can be used to help solve common challenges such as improving operational efficiency, increasing productivity and improving access to data to help reduce business costs. These patterns can include:

- *Using an existing Web service.*
- *Managing business processes.*
- *Aggregating user interfaces and interactions with applications.*
- *Implementing new applications based on Web services.*
- *Integrating IT applications with a service orientation.*



It is important to understand that RFIDIC is not just about automating a business process – it provides the foundation needed to execute those processes. SOA and scalability are important, but RFIDIC also offers high performance – a critical factor when dealing with millions of items and events along a distributed environment. Without high performance, virtually all benefits would be compromised.

RFIDIC has already been successfully deployed for a number of early-adopter IBM customers. For example, one pharmaceutical distributor customer uses RFIDIC for product serialization and authentication to automatically detect counterfeits. In addition, a large pharmaceutical manufacturer leverages RFIDIC track and trace software to help more accurately replenish safety stocks across the supply chain to avoid excess inventory and out of stocks.

### **IBM WebSphere RFID Information Center and SAP**

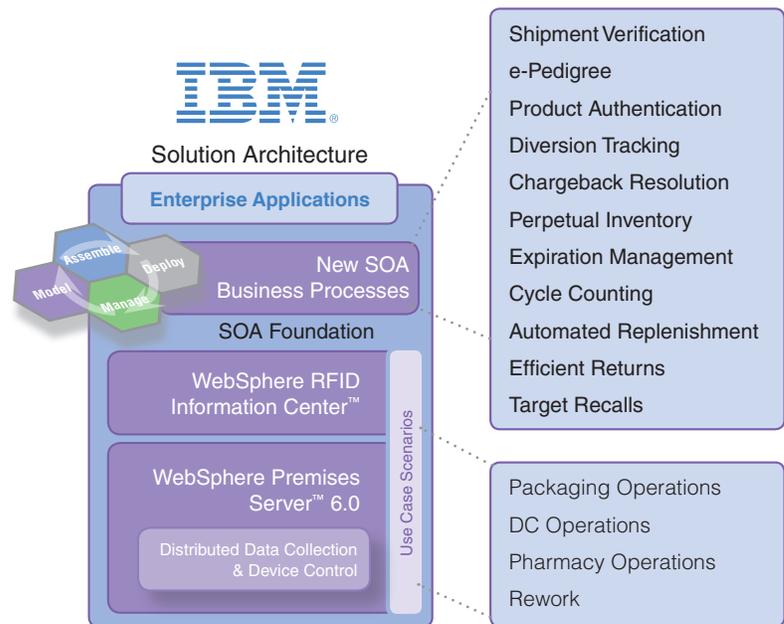
Designed to interact with SAP in a broad variety of ways, RFIDIC offers a low-risk solution for SAP users. The following examples illustrate how RFIDIC and SAP can work together to provide meaningful event data:

- *SAP AII can be a source of RFID events into RFIDIC through the capture interface.*
- *SAP MDM can be a source of product and location master data into RFIDIC through the master data interface.*
- *SAP xApps and SAP R3, etc. can gather events from calls to the query interface.*
- *RFIDIC can interface with SAP backend systems such as Warehouse Management and Order Management, share aggregate data where required, and utilize Web services where applicable.*
- *For more comprehensive integration with SAP, IBM offers Information Server which performs extracts, transforms and loads of disparate data into SAP while performing cleansing and de-duplication.*
- *WebSphere Process Service connectors can communicate with virtually all SAP modules.*

**IBM WebSphere RFID Information Center features**

The IBM approach to RFID solutions supports an incremental approach for adopting technology into a business environment, and provides components that are designed for future growth.

The following graphic shows the standards-based compliance of RFIDIC potential extending features that take advantage of serialized data for multiple business use cases:



**Shipment Verification: Collaboration**

The first available feature to take advantage of the robust data stored within RFIDIC is Shipment Verification, which is a two-way, business-to-business (B2B) communication that provides visibility into the delivery and receipt of goods. Part of a larger group of features called Order Management, it is primarily concerned with the delivery, receipt and order transaction of goods to help reduce short claims and provide advanced visibility of incoming goods.

Collaboration preempts errors and disagreements between trading partners along the supply chain simply because complete, accurate data is available to both parties. With granular security, the trading partner is limited to just that information they are intended to see augmenting negotiation. Decisions can be made quickly and soundly, to avoid supply chain issues around shipping and distribution.

**Pedigree: Compliance**

To combat drug counterfeiting, pharmaceutical organizations must soon meet stringent drug pedigree regulations. An electronic record of the transaction history, an e-pedigree helps validate the history of drug movement to give supply participants – and ultimately patients – confidence that drugs are safe.

Pedigree compliance is a critical component of the RFIDIC feature set. Designed through a close alliance with a Top 3 US Pharma Distributor, IBM offers an ePedigree feature that can help:

- *Significantly raise the cost barrier for counterfeiters and provide time accountability to the supply chain.*
- *Reduce counterfeiting and associated liability.*
- *Minimize discrepancies in shipping and receiving.*
- *Obtain downstream inventory visibility.*
- *Ease the burden of regulatory compliance measures.*

The IBM ePedigree feature utilizes the standard EPCIS framework to manage item, case and pallet level serialization as well as to provide standard queries to retrieve and share data. By enabling ePedigree via EPCIS, data captured for pedigree is accessible to help enable ROI through additional use cases such as efficient returns, targeted recall and inventory visibility.

Given the multiple means for producing and sharing pedigree that exist today in the industry, the flexible IBM ePedigree feature enables a framework for manufacturers, distributors and retailers to receive, create and share pedigree data in the form of a passed document (per the EPCglobal Drug Pedigree Standard) or via EPCIS events (through Track and Trace). This flexibility allows companies to interoperate with trading partners and to adhere to future pedigree laws with a single solution.

**Returns: Visibility**

Returns are an enormous cost and headache for pharmaceutical manufacturers. Not only do they represent lost sales, but often there is a discrepancy between what has occurred between retailer, distributor and manufacturer. Overall, returns can represent millions of dollars in lost sales and needless business effort.

Efficient returns are often categorized with a group of related business processes, including Reverse Logistics. Serialized data can be used to gain visibility to the movement of products and provide additional information for real-time decision making that is not available today. Reverse logistics, including efficient returns can take advantage of serialized data.

The business process for efficient returns would work something like this:

A drug is shipped from manufacturer to wholesaler to retailer or hospital. Unsold, the product is returned to the wholesaler who then queries to get the trace history of an EPC (the serial number is “burned into” the RFID tag carried with the product). This trace history enables the wholesaler to automatically determine the state of the item and identify issues. A decision to return or reject can be made automatically, enhancing what is now a manual and potentially error-prone process. Having this level of visibility and accurate, complete and readily available information offers the potential to save each member of the supply chain significant cost while improving revenue.

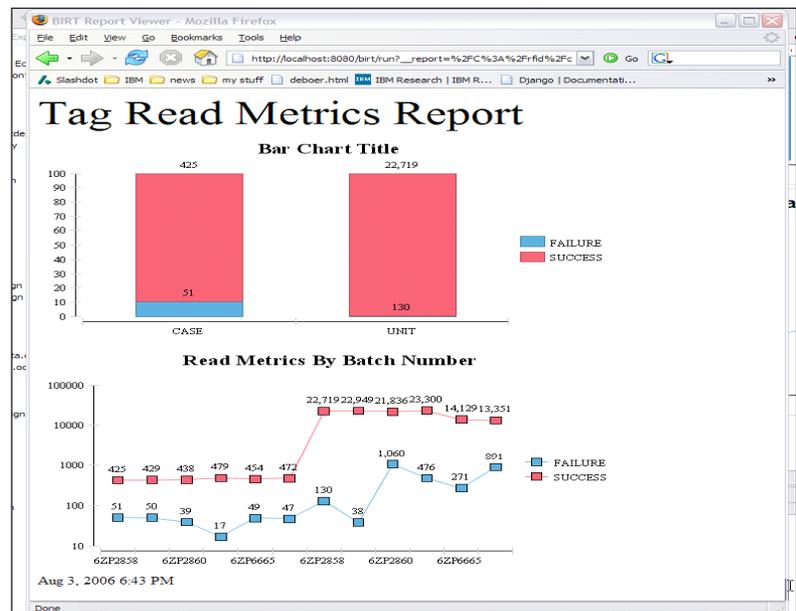
**Additional RFID capabilities: Alerts and reporting**

Alerts provide the big picture by keeping supply chain partners informed as to the state of the system. When a product is successfully received, an alert can be generated. Any member of the supply chain can subscribe to those alerts of interest to them. The following is a description of the four most common alerts:

- **Delivery notification:** *Endpoint and process that is to be used to deliver a message when the alert conditions are met for a single subscription.*
- **Discovery:** *Analysis of historical data alongside business processes to uncover scenarios and conditions that if proactively monitored could provide business optimization.*
- **Definition:** *Programmatic and semantic representation of input data and conditions that define a single alert scenario based on the underlying execution engine.*
- **Subscription:** *Individual subscriptions represent a single instance of predefined alerts with the ability to provide use-case specific parameters and information.*

RFIDIC provides an API and implementation for the definition, subscription and delivery of alerts. In the future, IBM intends to provide a stream of RFID event data, and MDM reference data into Coral8 which can then be used to integrate with IBM DB2®, IBM WebSphere MQ or RFIDIC as needed.

As with alerts, reports can help you achieve full visibility. RFIDIC integrates directly with BIRT, an Eclipse-based, open source reporting tool. Tooling is provided for development, testing and deployment of reports. These reports can be seen in a browser and exported to PDF or Microsoft® Excel®. Below is an example of a report.



### Summary

IBM WebSphere RFID Information Center is the first standards-based EPCIS and high-performance data repository that can help manage the growing volume of data, as well as provide real-time business information to support use cases that help prove ROI through visibility, compliance and collaboration.

Conducting pilots in the pharmaceutical, consumer product, transport and logistics, and retail industries helped support use cases including shipment verification, product authentication, inventory reduction and ePedigree.

These use cases leverage the power of the EPC Network for data sharing among trading partners and include:

- **Product authentication/anti-counterfeiting.** Detect counterfeit products before they reach the consumer—especially on high-margin items with high brand equity—including pharmaceuticals.
- **Shipment verification.** Allow shippers to verify receipts and receivers to plan for receipts to help mitigate the opportunities for theft or diversion of high-margin items in the supply chain and reducing chargebacks.
- **Serialized ePedigree/Regulatory requirements for traceability.** Comply with emerging government mandates—including pharmaceuticals (serialized ePedigree) and produce/animal tracking (regulations for tracking E. coli and mad cow disease).
- **Out-of-stock reduction.** Detect and prevent inventory shortages, especially on time-sensitive, high-value inventory including consumer products promotions in retail stores and medical devices in hospitals.
- **Excess inventory detection.** Detect and prevent excess inventory in the channel, including high-value products manufactured in batches—including pharmaceuticals and semiconductors.
- **Expiration management.** Detect and sell product before it expires—especially on high-margin rapidly decaying inventory—including fruits, vegetables, and consumer electronics.

**How to get started**

As part of its continued development effort, IBM has established Centers of Excellence that offer RFID-focused testing facilities to help clients and partners better understand and take advantage of RFID technologies.

Based on pilots, along with IBM leadership and involvement in the EPCglobal standards organization, WebSphere RFID Information Center is uniquely positioned to support you in leveraging RFID and other sensor data to transform your business, from strategy through pilot execution and solution, to process integration.

**For more information**

To learn more about IBM WebSphere RFIDIC, visit [ibm.com/solutions/businesssolutions/sensors/doc/content/solution](http://ibm.com/solutions/businesssolutions/sensors/doc/content/solution) or contact your IBM representative.



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