
RFID and Product Intelligence

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Aim

Beyond bar code replacement ...

To emphasise the role that RFID-based identity sensing can play in building the “internet of things”

Overview

- Auto ID Labs
- RFID and the Product Intelligence
- Intelligent Products of the Future ?

Auto ID Center



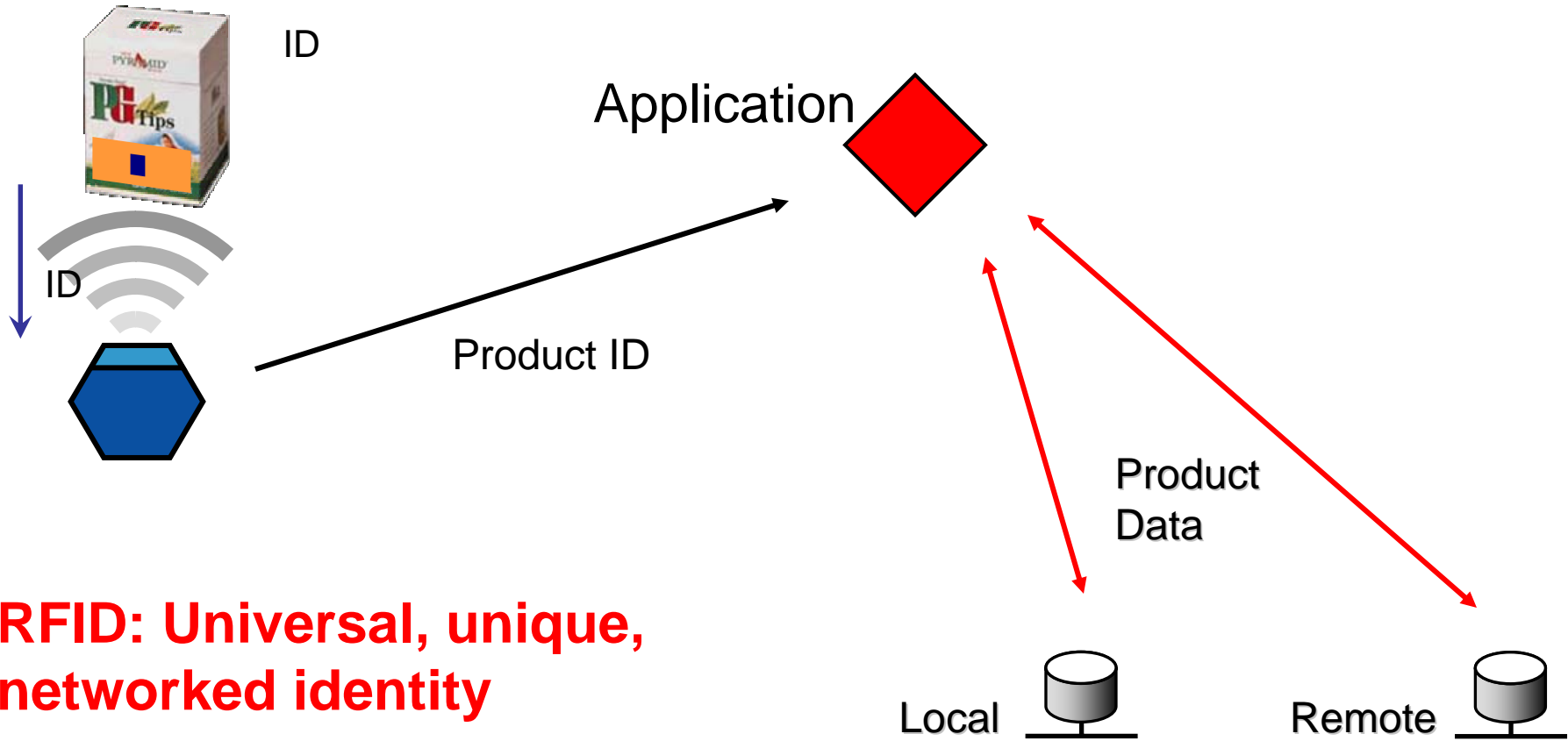
October 1999-
October 2003

Drivers

- Low cost, simple RFID tags and readers
- Universal specifications / multiple applications
- *Consumer goods oriented*



Auto ID Center: Networked RFID



**RFID: Universal, unique,
networked identity**

Auto-ID Labs - a global network



Cambridge Lab Research Focus

- Integration: managing ID information once on network
Closed Loop ID Systems:
ID -> Product Information -> Decisions
- Product Lifecycle Information Management: examining impact along entire supply chain



High-speed conveyor belts and state-of-the-art technology help move merchandise efficiently through the distribution centers, keeping Wal-Mart's nearly 2,000 stores in stock.



100 million shoppers a week.

Relevant Project Activities

- PROMISE (EU)
- RFID in Product Life Cycle Decisions (retail, recycling) (EPSRC)
- Drug Security Network (CMI)
- Aerospace ID Programme (Ind)
- RFID in Service & Support Engineering (Ind)
- BRIDGE (EU)



Aero ID Programme

- Aim: To remove barriers to widescale Automated ID deployment through timely and effective R&D
- Approach: 18 month programme focussed on key research barriers
- Partners include: Boeing, Airbus, BAE Systems, Embraer, BT, T Systems
- Themes include:
 - Tracking and tracing models
 - Sensor fusion
 - Managing ID lifecycle



PROMISE: PROduct lifecycle Management and Information tracking using Smart Embedded systems

- Aim: Develop models and technologies for decision-making based on product lifecycle data
- Approach: 42 month program focussed on developing technologies and systems, and building demonstrators.
- Partners include: Bombardier, Caterpillar, Cognidata, Fiat, Infineon, SAP
- Themes include:
 - Lifecycle information flow models
 - PLM Infrastructure
 - Standards



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- **RFID and Product Intelligence**
- Intelligent Products of the Future ?

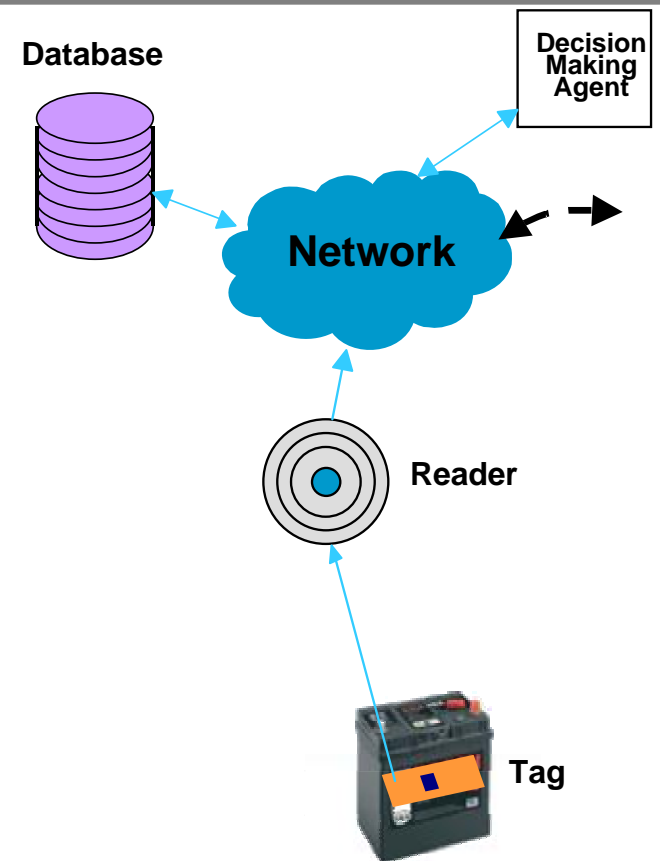
Product Intelligence

A physical and/or information based representation of an item which (McFarlane et al, 2002):

Information-Oriented

- (1) possesses a unique identification
- (2) is capable of communicating effectively with its environment
- (3) can retain or store data about itself
- (4) deploys a language to display its features, production requirements etc...
- (5) is capable of participating in or making decisions relevant to its own destiny

Decision-Oriented



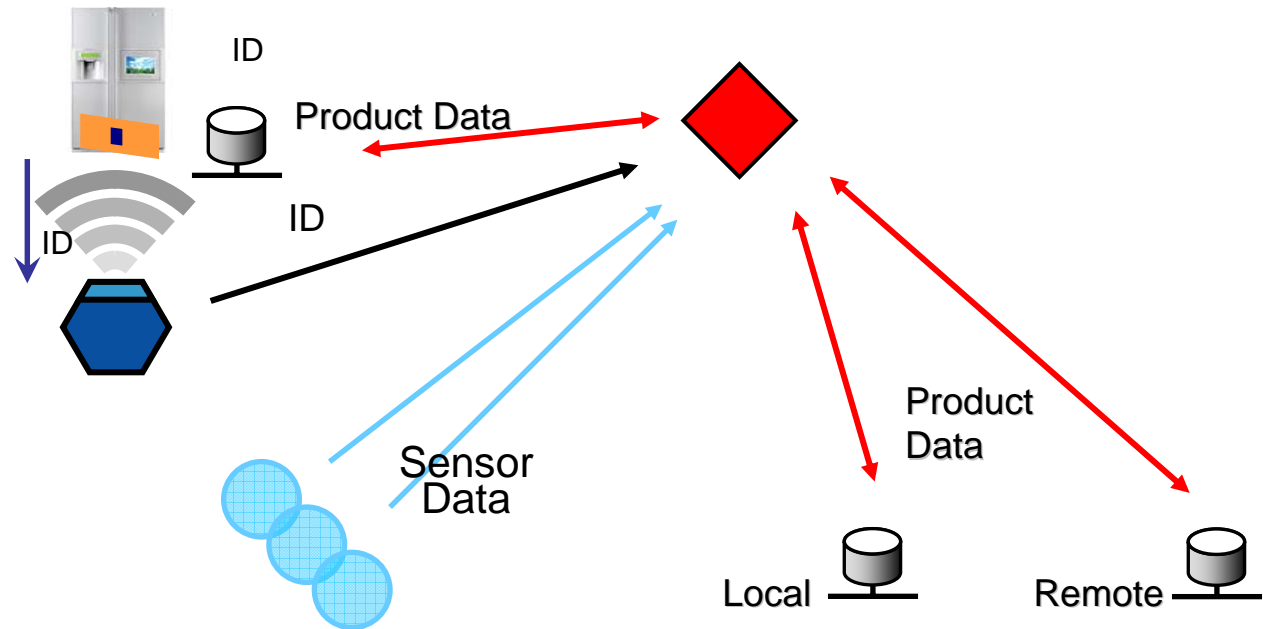
Product Intelligence

Key components for product intelligence?

Auto Identification

Sensory information

Product data



RFID and Products of the Future

“RFID at present appears to be an evolutionary rather than revolutionary technology?”

(Prof Charley Fine, MIT)

Evolutionary

Supporting businesses of large, incumbent organisations:

- Cost reducing
- Improving Efficiency
- Reducing response times
- Eliminating losses, waste, substitutions

Revolutionary

Challenging existing business models, providing opportunities for new players

... meaning??

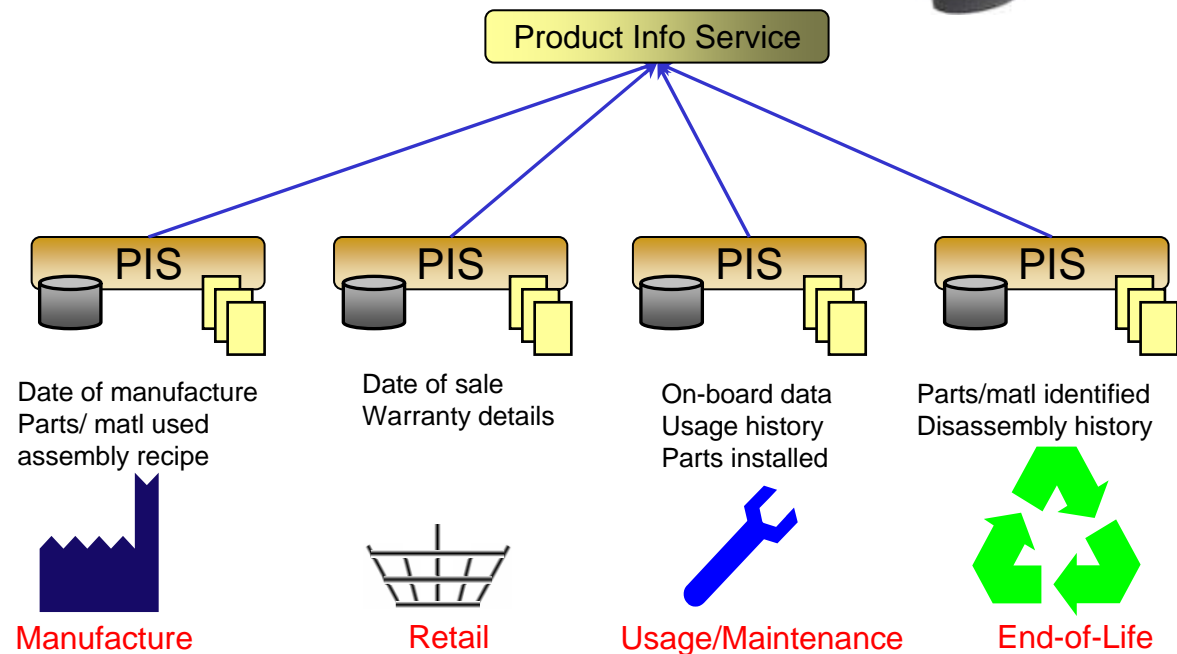
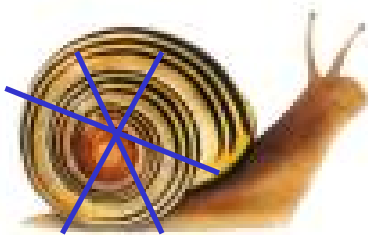


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Information Rich Products

The product as a self contained unit comprising all physical capabilities and information support



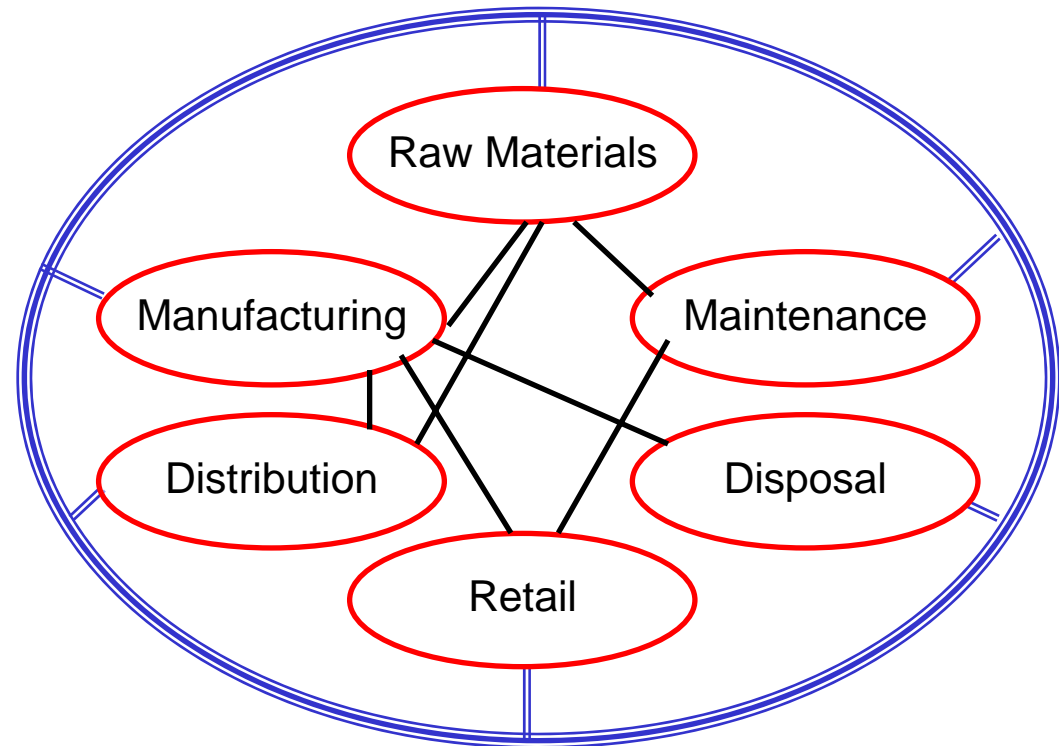
Information Rich Products

RFID Role?:

Provision of unique ID
pointer to networked
data

Why Revolutionary?:

Entire rethinking of SC
data management



SC Data Service

Highly Customised Products

Products made, packed, delivered, displayed based on a specific, unique user need



Role for RFID? Ensuring instructions are uniquely & tightly linked to physical components, products, equipment.

Why revolutionary?: embed consumer directly into supply chain

Service Oriented Products

Products increasingly linked to service agreements – leasing models, domestic and low cost industrial products included

Role for RFID?

Service reference point,
coupling with other sensors



Why revolution

open loop =>
closed loop appliances



Self Managing Products

Embedded or networked product intelligence enabling designs, products, orders to manage their own make, move, use, dispose functions



- Product data base contains assembly recipe
- Software Agent negotiates assembly process for the order
- Software Agent *escorts* products through manufacturing
- RFID tags on items, containers and shuttles ensure perfect synchronisation

Self Managing Products & Orders

Role for RFID?

Wireless connector between intelligent instructions and physical object

Why revolutionary?:

Transform the entire notion of industrial automation to a user driven environment



Intelligent Consumer Product

Role for RFID?

Wireless connector for sensor data and information exchange

Why revolutionary?:

Opportunity for consumer products to interact with users providing useful intelligent service



The 'Adidas 1' uses a sensor, a microprocessor and a motorized cable system to adjust shoe's cushioning

RFID and Products of the Future

Evolutionary

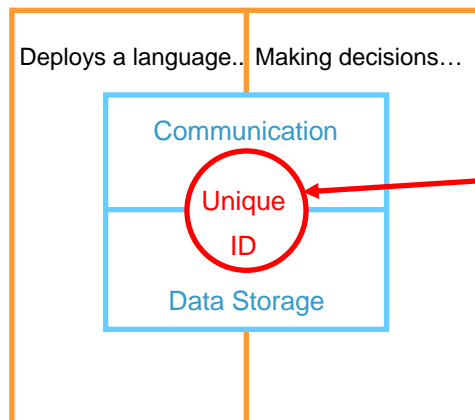
Supporting businesses of large, incumbent organisations:

- Cost reducing
- Improving efficiency
- Reducing response times
- Eliminating losses, waste, substitutions

Revolutionary

Challenging existing business models, providing opportunities for new players:

- Customisation
- Decentralisation of information and intelligence
- Enabling new supply chain models
- Intelligent consumer products



RFID as a key linkage between products and their associated sensory and networked data