
RFID and Products of the Future

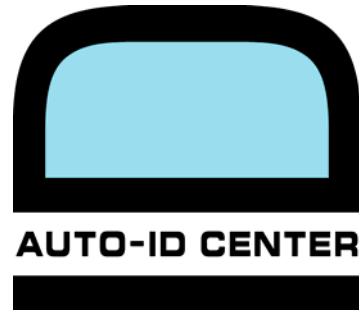
Duncan McFarlane
Research Director
Cambridge Auto ID Labs

RFID Forum, London
May 2005

Overview

- Auto ID Labs – Overview
- RFID and the Products of the Future

Auto ID Center

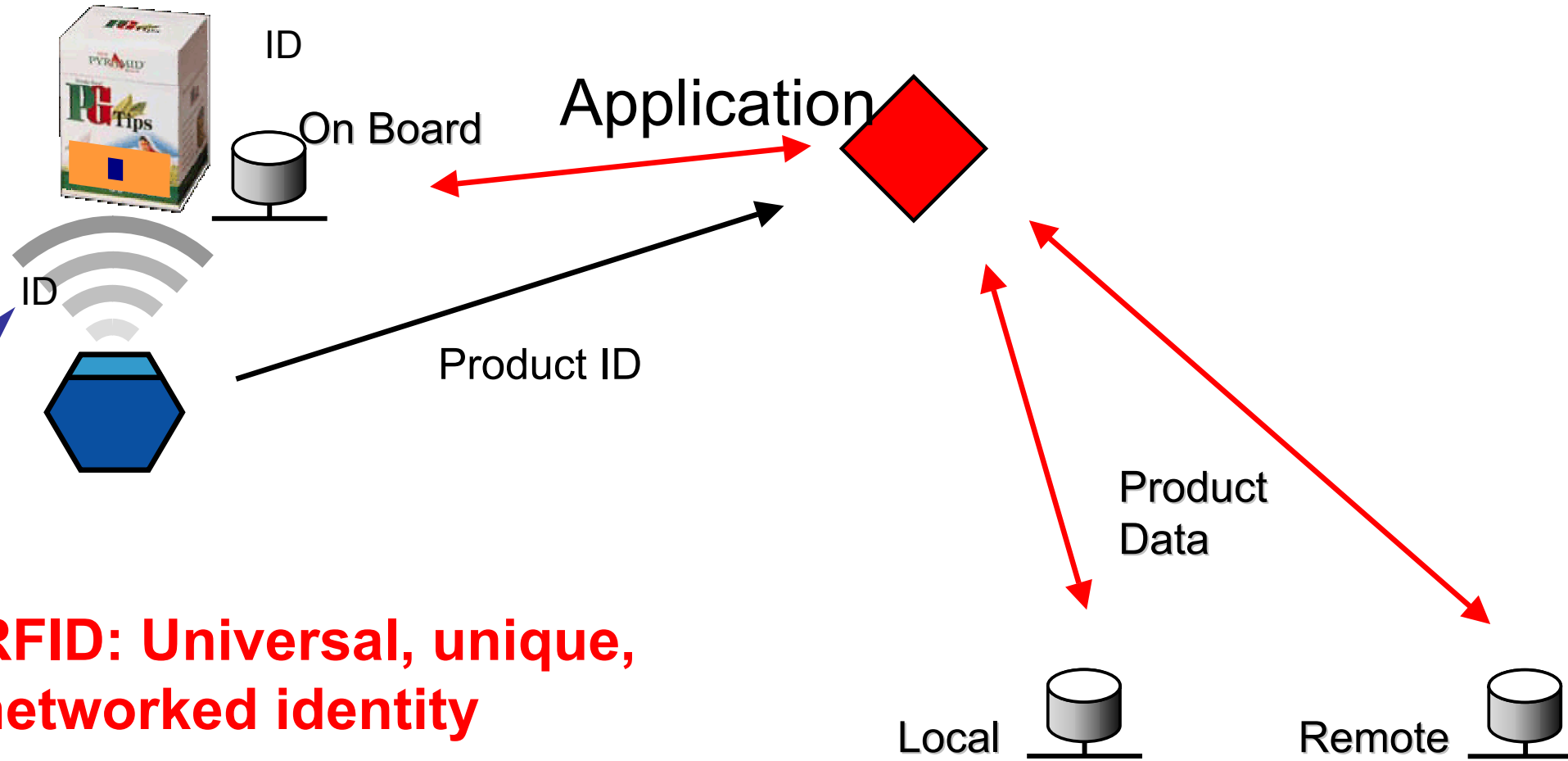


October 1999-
October 2003

Drivers

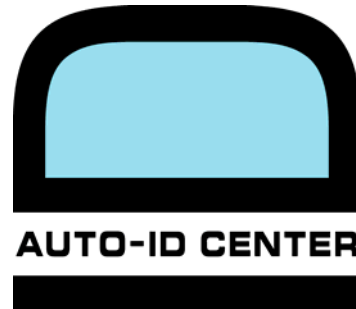
- Low cost RFID tags and readers
- Universal specifications / multiple applications

Auto ID Center: Networked RFID

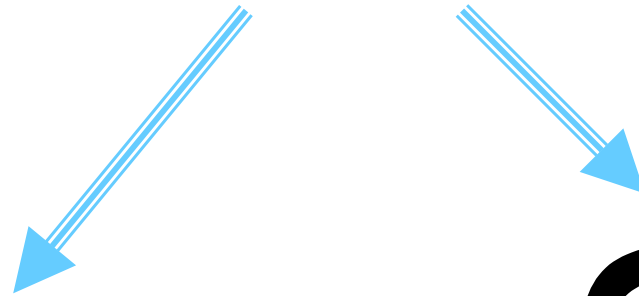


**RFID: Universal, unique,
networked identity**

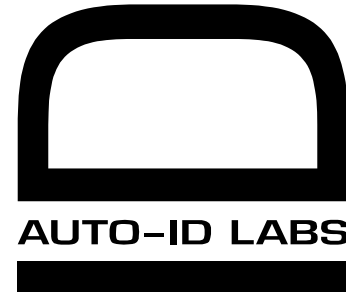
EPCglobal and Auto ID Labs



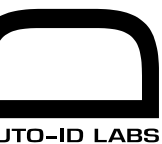
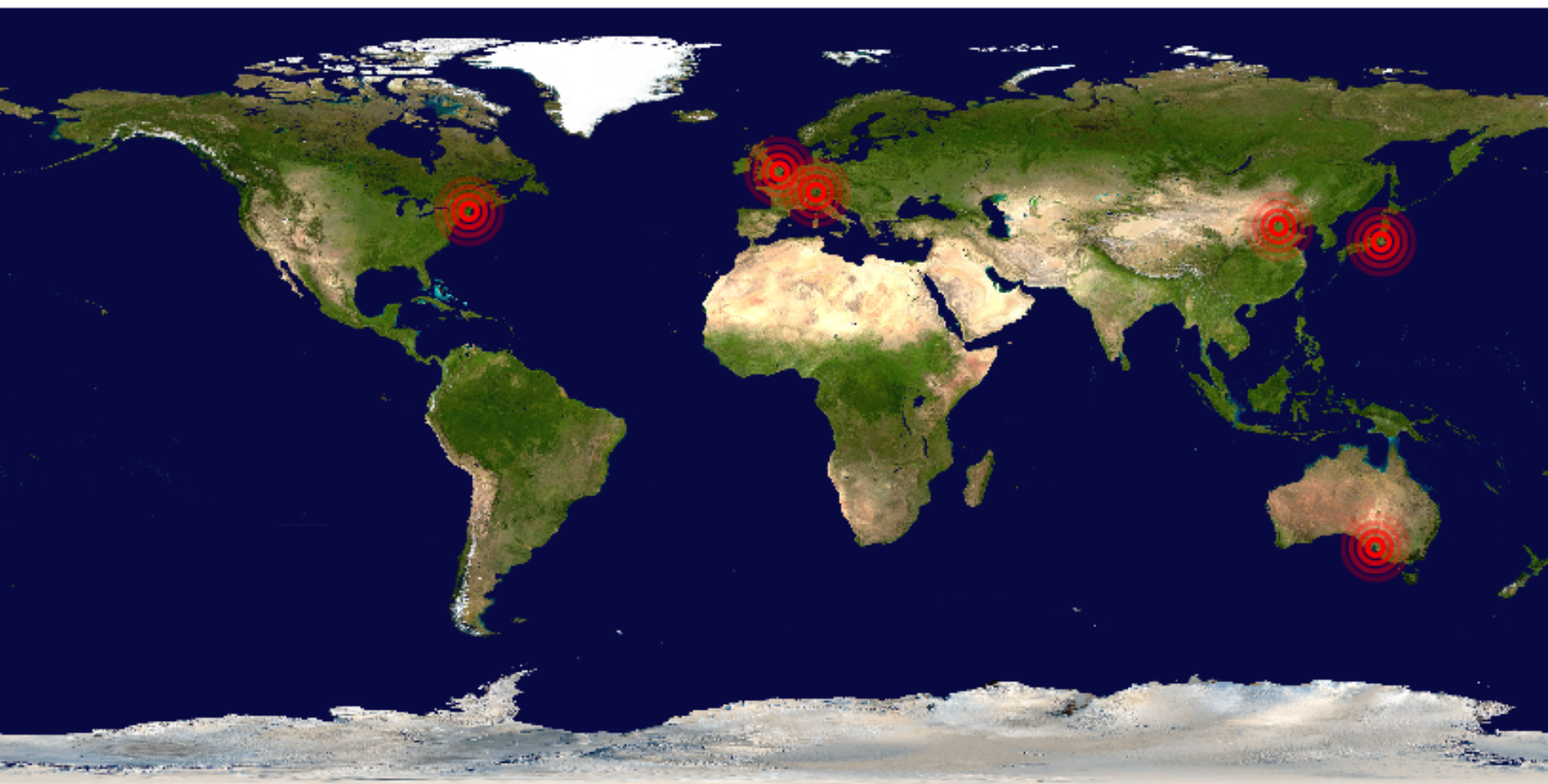
October 1999-
October 2003



November 2003



Auto-ID Labs - a global network



Centre for Distributed
Automation and Control



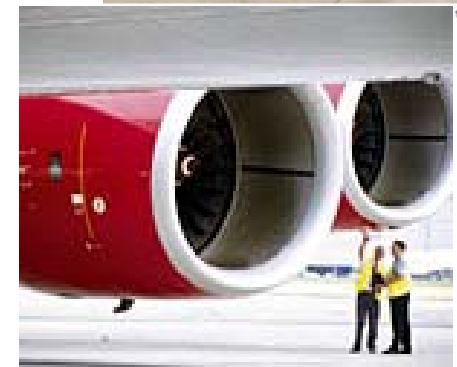
UNIVERSITY OF
CAMBRIDGE
Institute for Manufacturing

Cambridge Research Focus

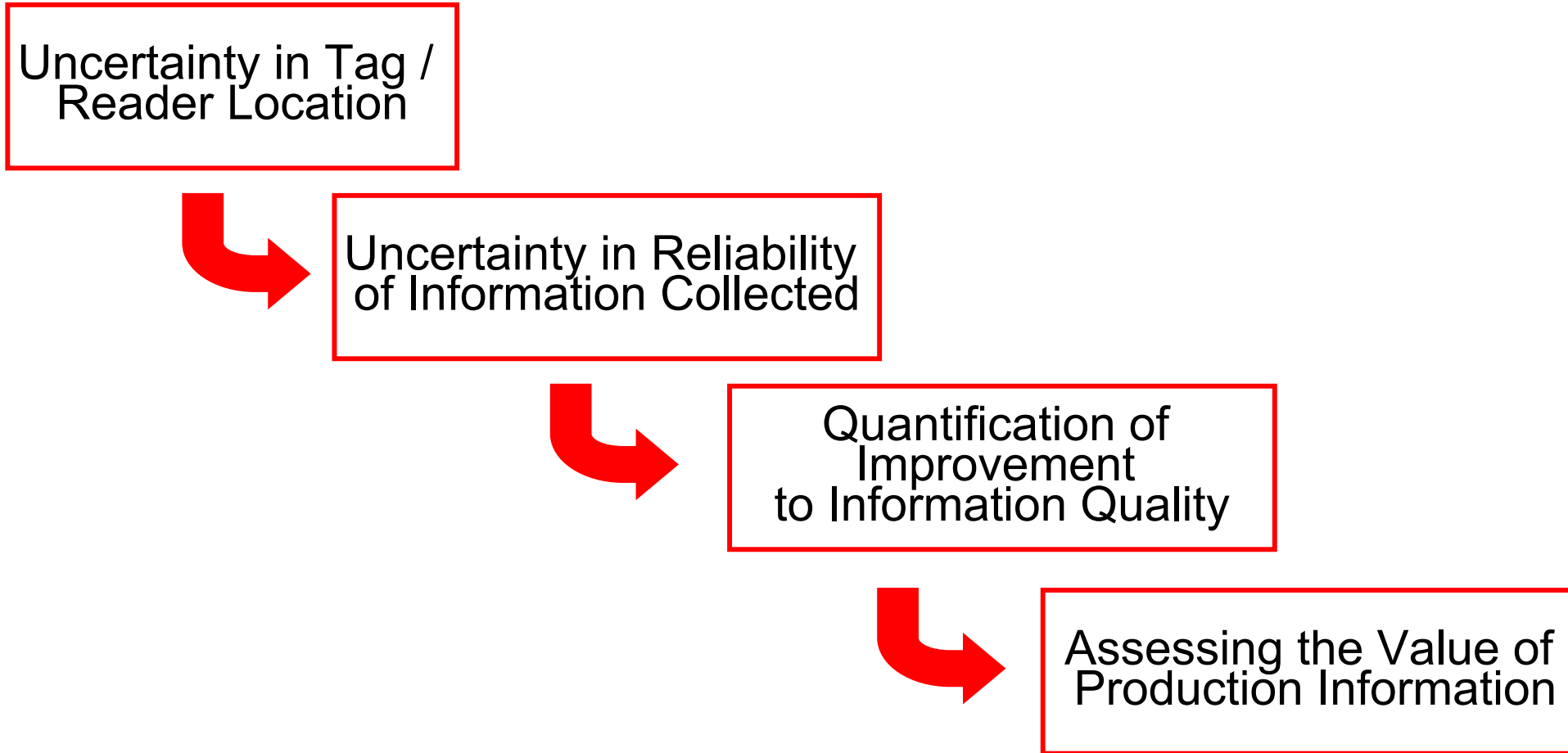
- Focus on managing ID information once on network (RFID a tool)
- Closed Loop ID Systems:
ID -> Product Information ->
Decisions
- Based in IfM, applications examining impact along entire supply chain
 - *Manufacturing*
 - *Distribution*
 - *Retail*
 - *Maintenance*
 - *Disposal/Reuse*



High-speed conveyor belts and state-of-the-art technology help move merchandise efficiently through the distribution centers, keeping Wal-Mart's nearly 3,000 stores in stock.



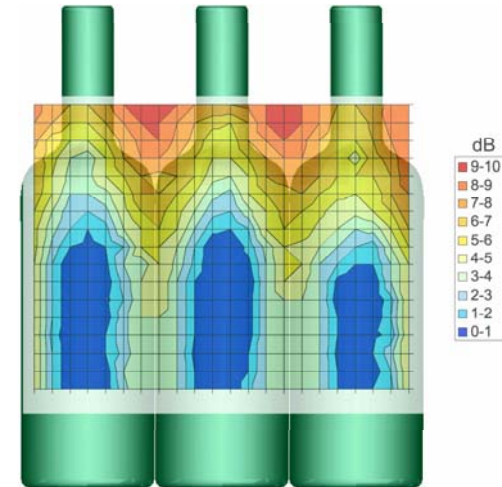
Benefits from RFID: Reducing Uncertainty



Activity Portfolio

- Tag Data Standards
- RFID and location, tracking
- Real Time RFID automation issues
- RFID information services

- RFID and Automation industry
- Retail replenishment
- maintenance, end of life studies



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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:

Revolutionary

Challenging existing business models providing opportunities for new players

RFID Revolution?

Some points:

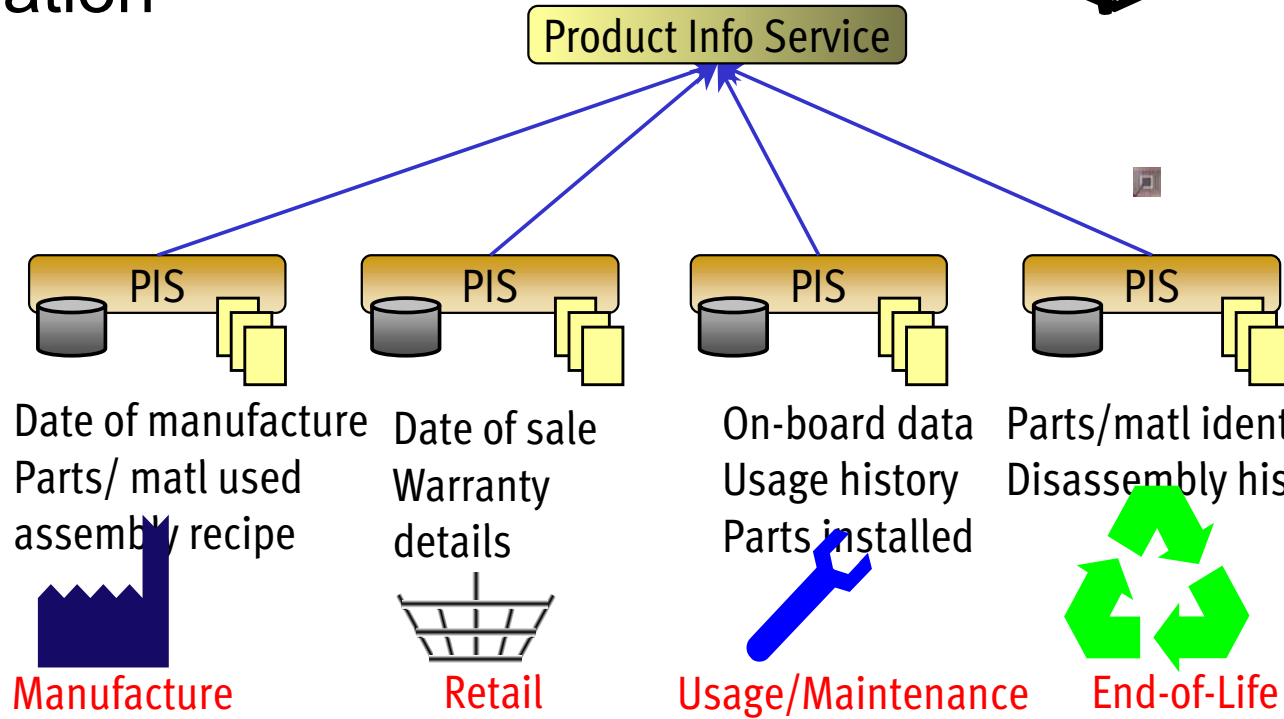
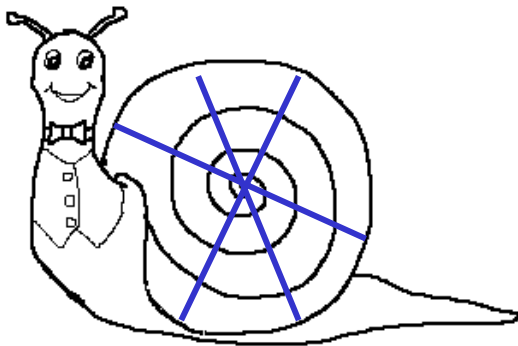
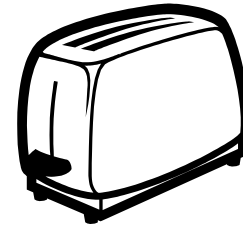
- Mobile phones/PDAs, internet, ethernet didn't begin as revolutionary technologies
- Business cases have been a problem for many (successful) new technologies
- The key to RFID is the placing of a unique ID on a network automatically ... not simply as a bar code extension

Products of the Future?

- Information Rich
- Highly Customised
- Service Oriented
- Self Managing (“Smart”)

Information Rich Products

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



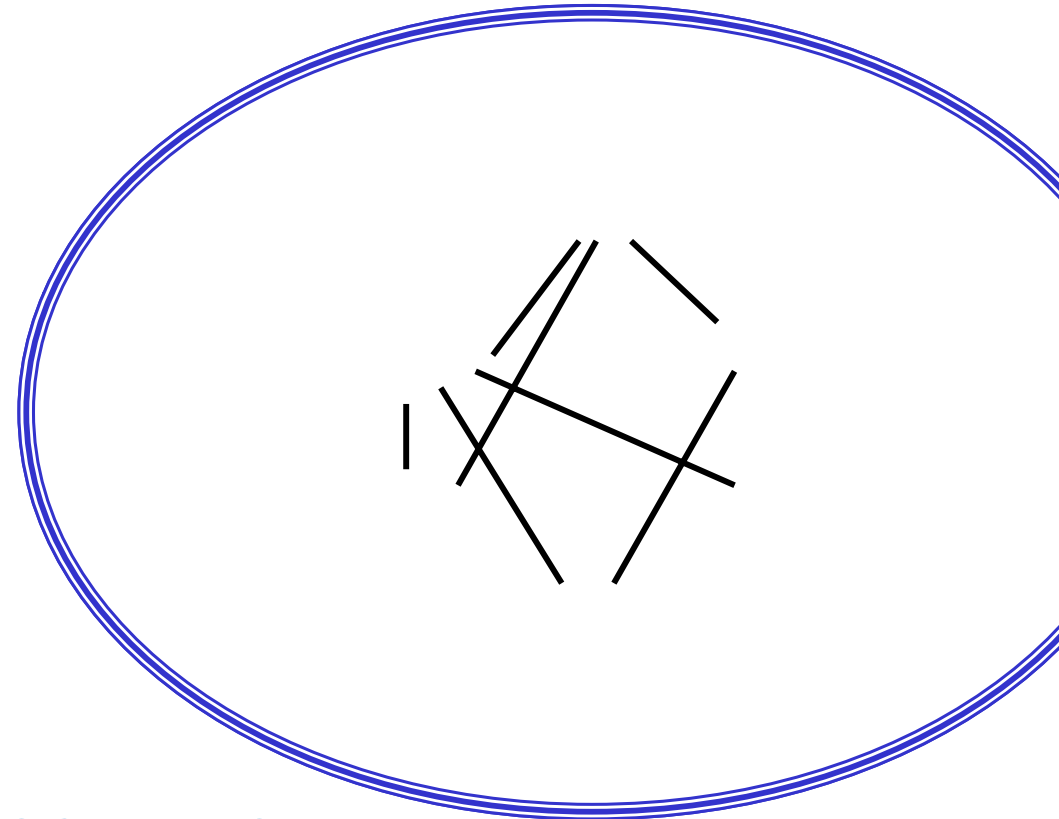
Information Rich Products

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
revolutionary*

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
- Where Next?

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



Self Managing Products

Automated Product Recall



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

RFID as the unique linking between products and their associated networked data

Wrap-Up

- RFID R & D issues
autoid-enquiries @ eng.cam.ac.uk
- Aerospace ID Technology Programme
www.aeroid.org
- Open Source RFID Software
www.opensourceinnovation.com