
RFID in Manufacturing

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Overview

- Introduction to Networked RFID
- RFID in Manufacturing

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- RFID in Manufacturing

Auto ID Center: 1999-2003

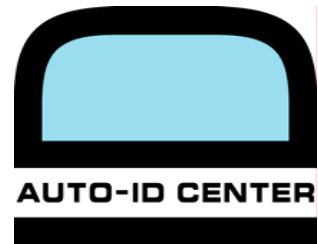
- **Mission**
 - Re-think the role and implementation of the barcode
 - Connecting information and physical flows (“ bits to atoms”) in the supply chain
- **What do you need to do this?**
 - Some way of automatic, reliable transfer and update of information based on physical operations
 - One single system for the whole supply chain
 - RFID as the key element
- **Project:** 103 companies, 6 universities, \$15M

Key Thrusts

1. **low cost tags and reader systems**

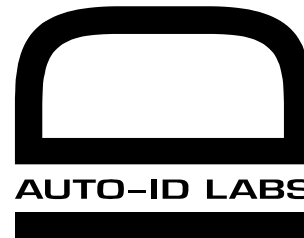
2. **business justification through multiple applications/companies**

EPCglobal and Auto ID Labs



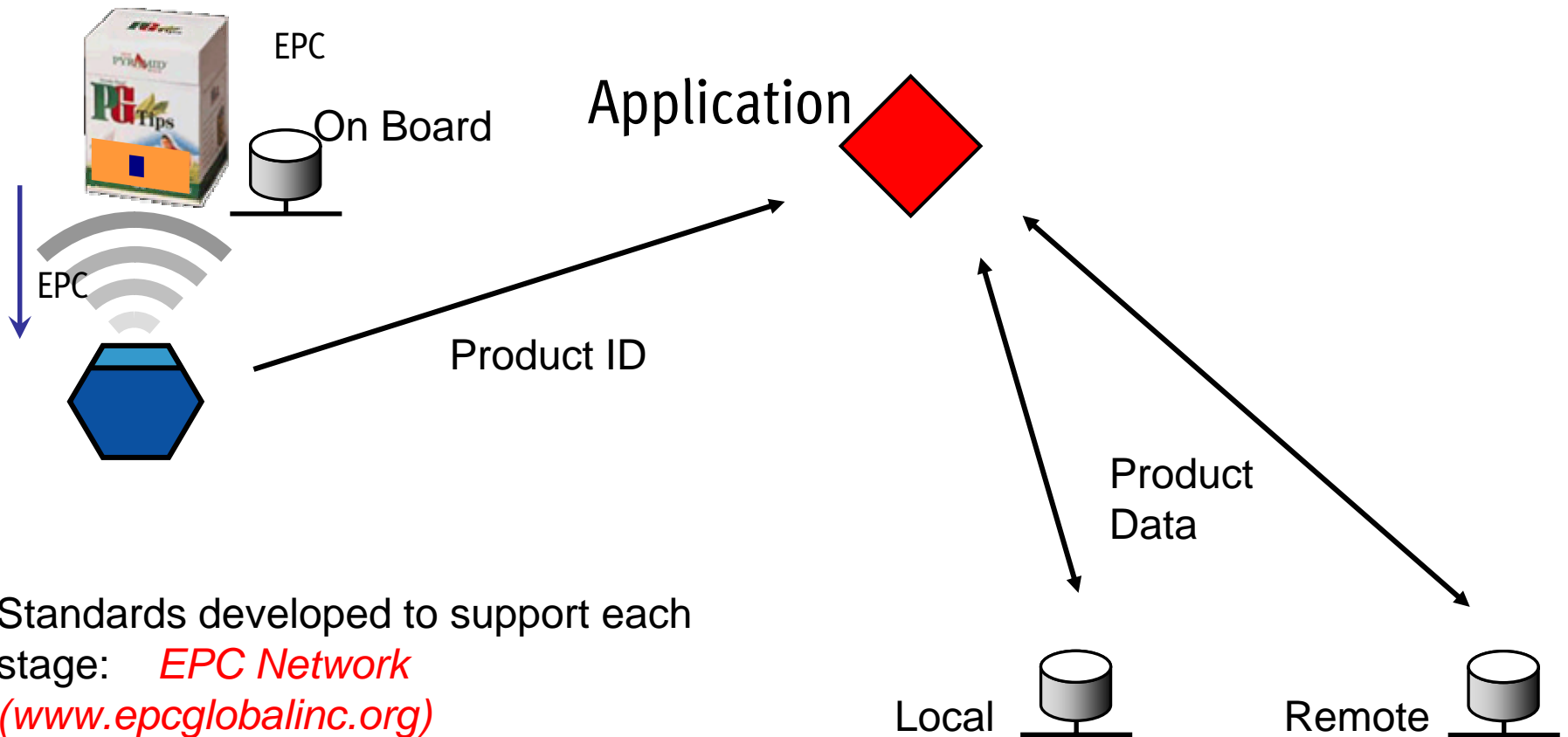
31 October 2003

1 November 2003



MIT, USA
Cambridge, UK
Adelaide, Australia
St Gallen, Switzerland
Keio, Japan
Fudan, China

Networked RFID



Standards developed to support each stage: *EPC Network* (www.epcglobalinc.org)

Key Thrusts again

- 1. low cost tags and reader systems**
 - > reducing chip price = reducing amount of silicon
 - > minimising information stored on chip
 - > ID on chip only, other information on data base

- 2. business justification through multiple applications/companies**
 - > standardised tag/reader systems
 - > standardised data management and comms
 - > EPC network as extension to the internet

Stand Alone RFID v Networked RFID

	Tolling	Library	Asset	Baggage	EAS	Supply Chain
Complexity of Information on Tag	M	L	H	L	L	L
Single or Multiple Applications for Each Tag	S	S	S	S	S	M
Volume of Tags	L	L	L	M	M	H
Expected Life of Tag	H	H	H	M	M	L

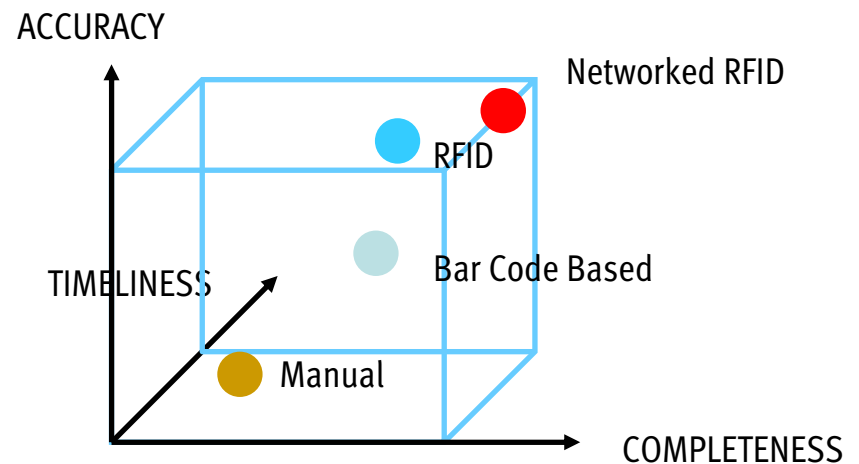
Source: Hodges, McFarlane, Radio Frequency Identification: Technology, Applications and Impact, OECD Report, Dec, 2003

Pre 99

Post 99

Benefit of Networked RFID

- value of Networked RFID is in enhancing the quality of information available to make decisions
- information quality dimensions
 - accuracy
 - completeness
 - timeliness



- benefits only extracted when *information is turned into action*
- ... *automation*

overview

- Introduction to Networked RFID
- **RFID in Manufacturing**

RFID in Manufacturing

Little direct attention lately but

- Applied in auto sector for 20 years
- most technological advanced element of the supply chain
- sophisticated IT systems geared for real time data
- manufacturer is increasingly responsible for the products life cycle
- manufacturer is often the central hub of the supply chain
- decoupled from the privacy concerns
- Growing interest in aero, pharma, electrical

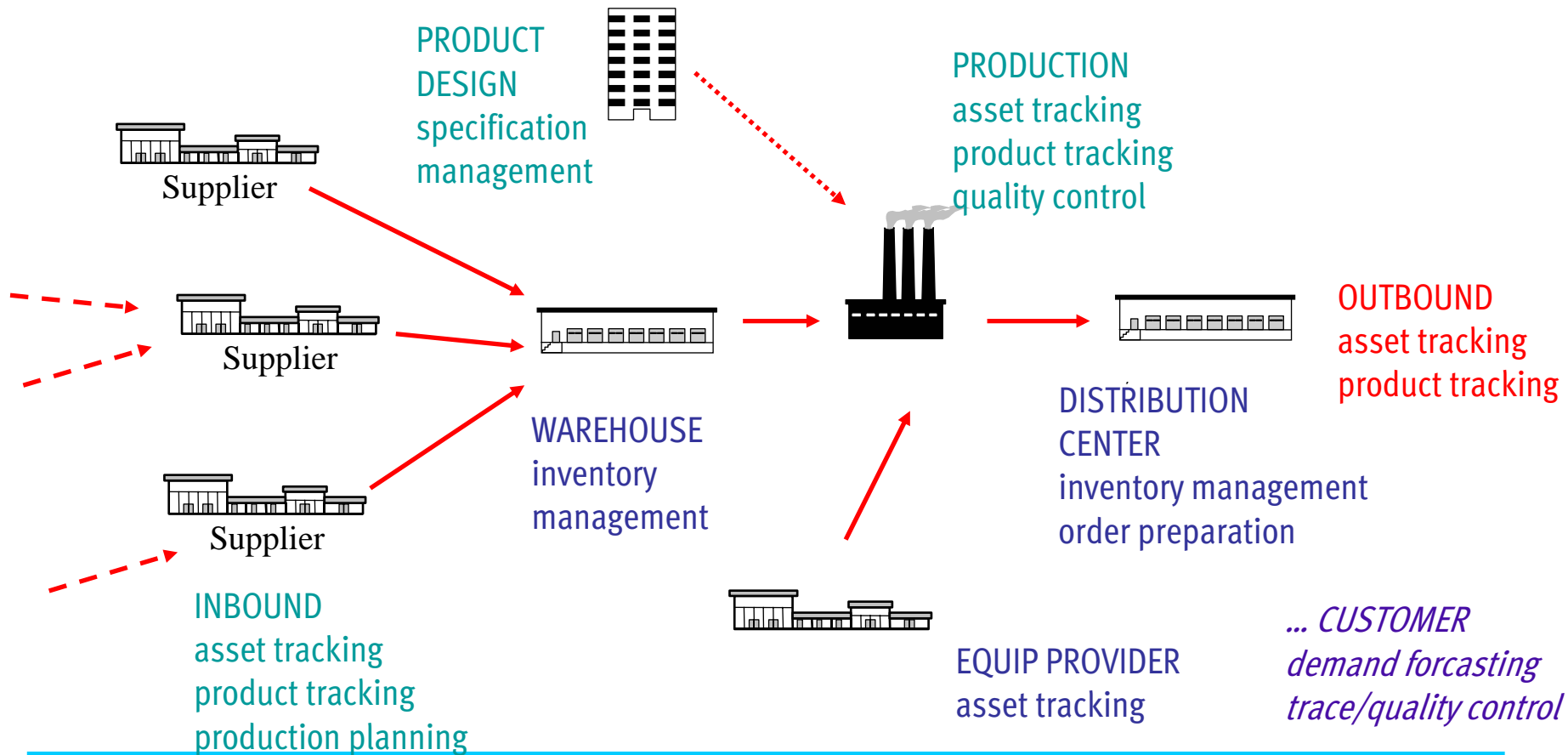
Why deploy in manufacturing?

Zero Term – Compliance Driven

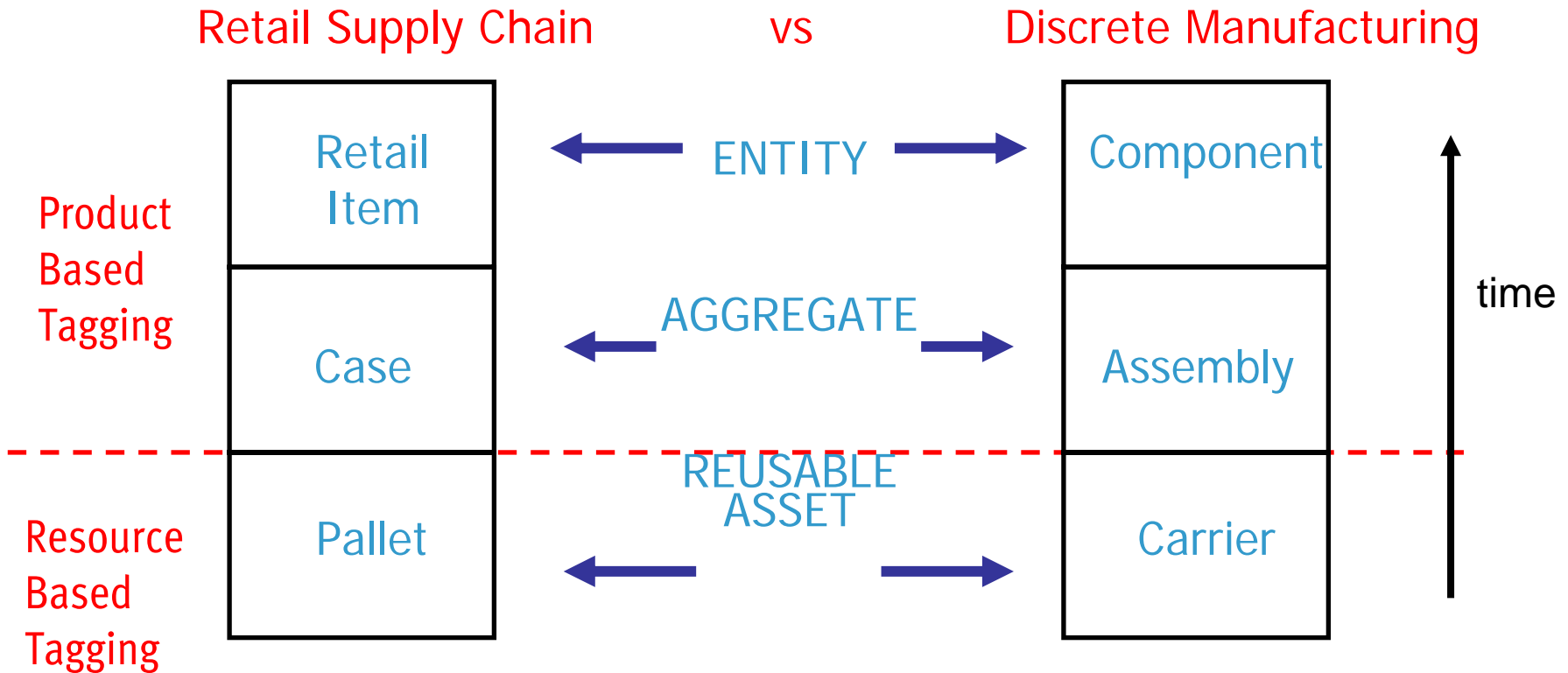
Near Term – Cost Driven

Medium Term – Value Driven

Where to deploy?

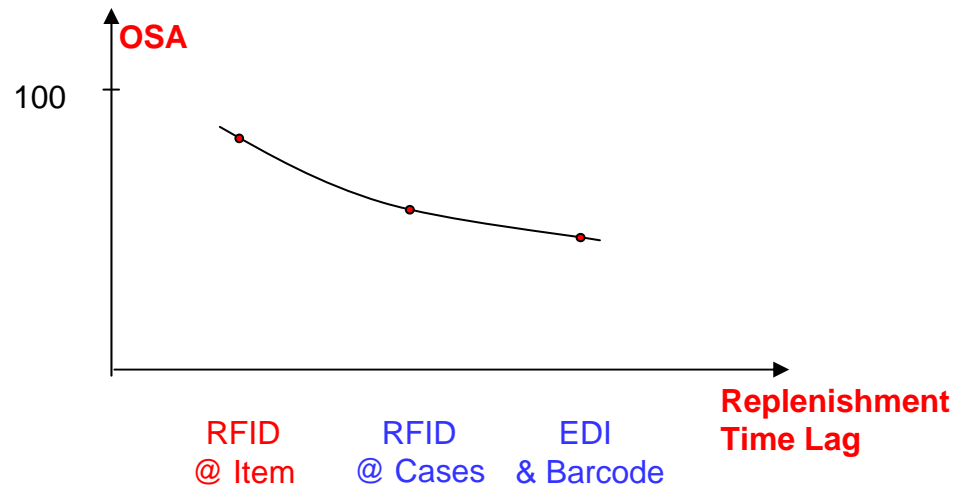


How to deploy RFID tags?



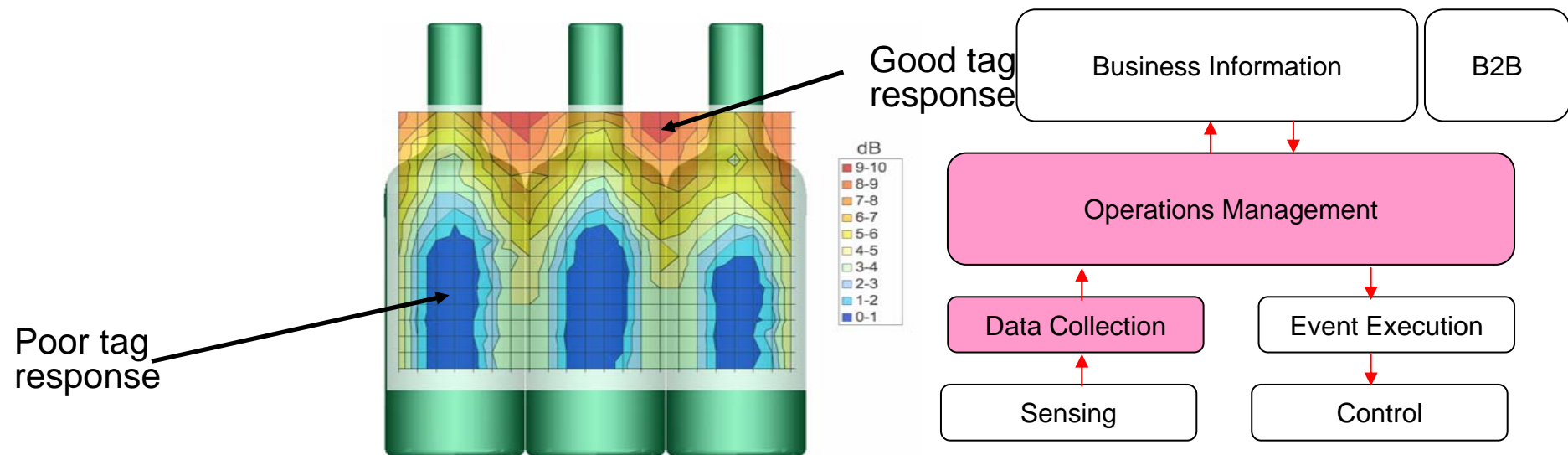
Deployment Issues: Short Term

- Business
 - Legislations/Mandates (FDA, DOD, Retailer)
 - RFID as an infrastructural technology
 - Neutral business cases based on local cost reduction
 - Downstream benefit / using downstream information



Deployment Issues: Short Term

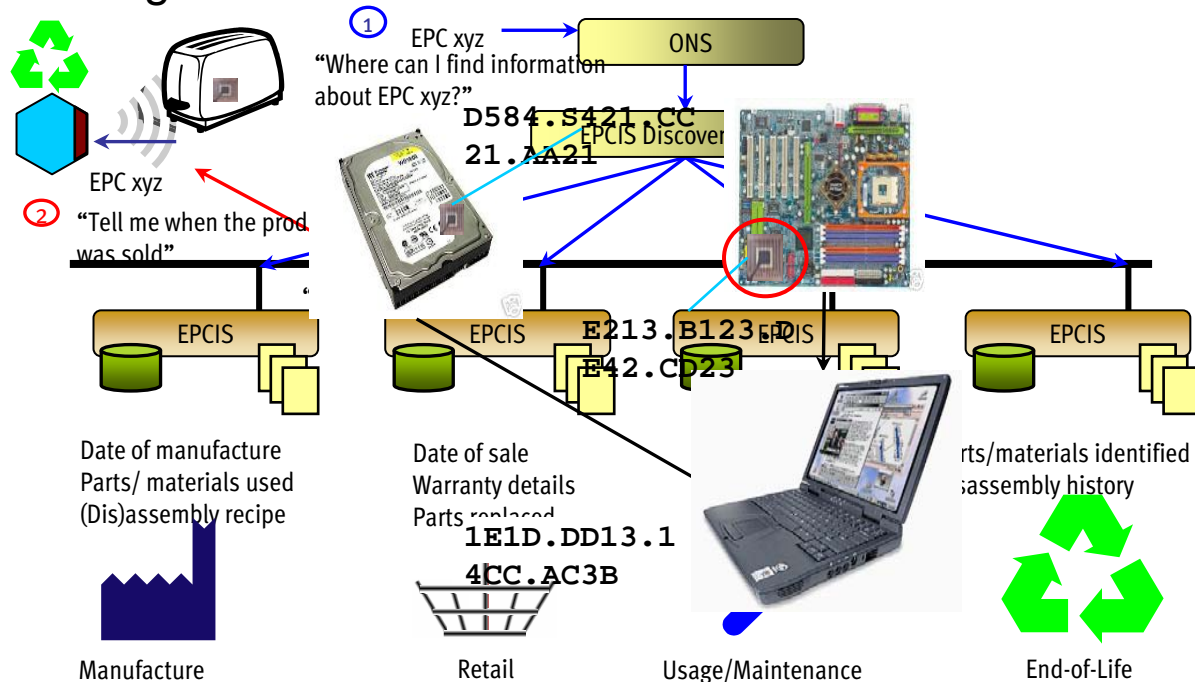
- Technical
 - RFID issues (metals, interference, location)
 - Integration with existing infrastructure
 - Real time rfid?



Deployment Issues: Long Term

- Business

- Innovation: RFID for strategic advantage
- Support: product -> service migration
- Reverse Logistics
 - Product recalls
 - returns management
 - End of life legislations



Deployment Issues: Long Term

- Technical
 - Managing networked product data
 - Enabling “thinking” products
 - RFID as part of a tool kit for
 - Low cost customisation
 - Flexible Outsourcing

Cambridge Manufacturing RFID Development Environment



↓
(late) customised order
& manufacturing “recipe”



Flexible manufacturing
RFID tagged parts, packaging
Order drives its own production

Auto ID Labs: RFID in Manufacturing SIG

- **Aim:** Provide a focus for common research and development issues in manufacturing RFID deployment
- **Typical R&D Themes**
 - RFID Deployment
 - Systems Integration
 - Reengineering
 - Adoption support
- **Programmes:** Sector specific – aerospace, ...electrical goods, consumer products
- **Location:** Cambridge – global team of labs/organisations
- **Register:** autoid-enquiries@eng.cam.ac.uk

