



# Auto-ID Labs ID Technologies Programme

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Cambridge Auto ID Labs  
Institute for Manufacturing  
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Centre for Distributed  
Automation and Control





# Overview

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- Auto ID Labs – A Global Research Network
- Auto ID Labs at Cambridge
- Research Areas
- Aerospace ID Technologies Programme



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# 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





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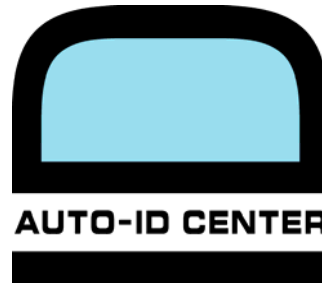
# Auto ID Center: Key Thrusts

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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
  - RFID network as extension to the internet



# EPCglobal and Auto ID Labs



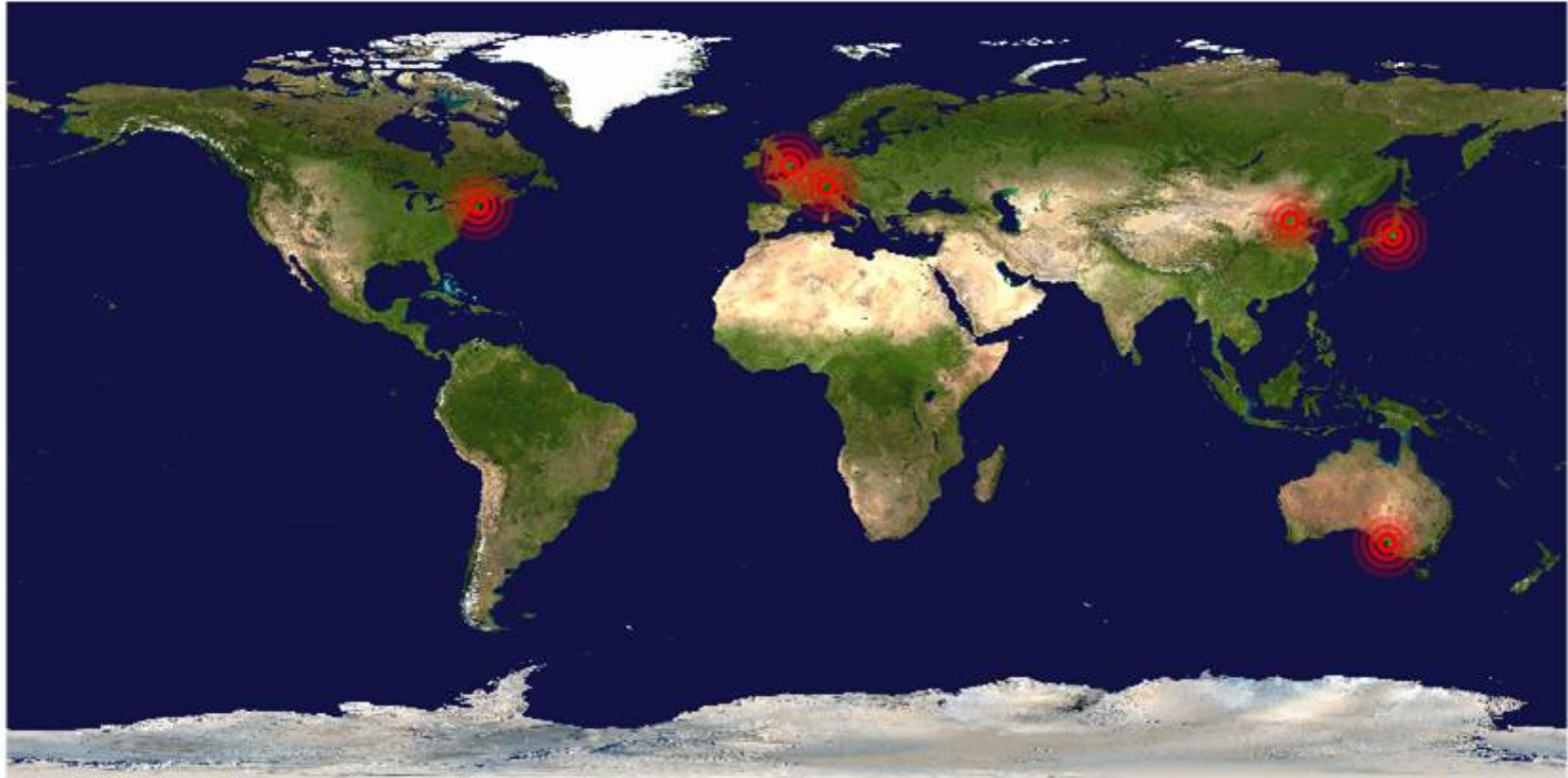
October 1999-  
October 2003

November 2003





# Auto-ID Labs - a global network





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# Cambridge Auto-ID Labs

- Based in Institute for Manufacturing at Cambridge
- Intelligent Automation Systems research since 1995
- Ran European Auto ID Center 2000-2003
- Industrially driven research programme
- 7 staff, 9 researchers, 3 industrial fellows
- Key People:

Director: Duncan McFarlane

Associate Directors: Alan Thorne, Mark Harrison

Business Manager: Andy Shaw



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# Industrial Collaborators

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**Manufacturing:** Britvic, Unipart, Alcatel, ASW, Corus, Henkel, BAeSys, Druck, Daimler Chrysler, BHP Billiton, Unilever, Kawasaki, Gillette, P&G, Bombadier, Fiat

**Retail:** Tesco, Walmart, Ahold, Metro

**Systems:** SAP, Invensys, Rockwell, OMRON, AOS, BT, Accenture, CGEY, IBM, Fanuc, Siemens

**Remanufacturing:** Mbaker, RefurbIT, Klassic, MIREC, Calyx, SecureIT



# Automation Laboratory

- Centre piece to CDAC activities
- Enormous development over 7 years
- Industrial strength testing of research developments
- Ongoing visitor stream (>1 per week)
- Third phase of development concluded
- Work underway integrating Rockwell, Invensys systems



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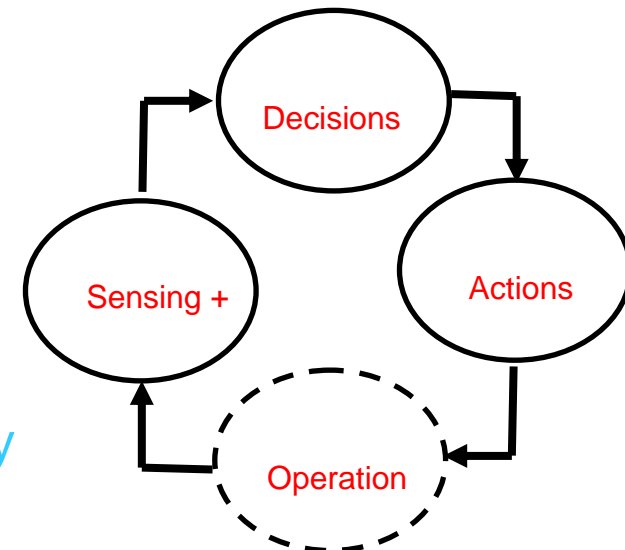
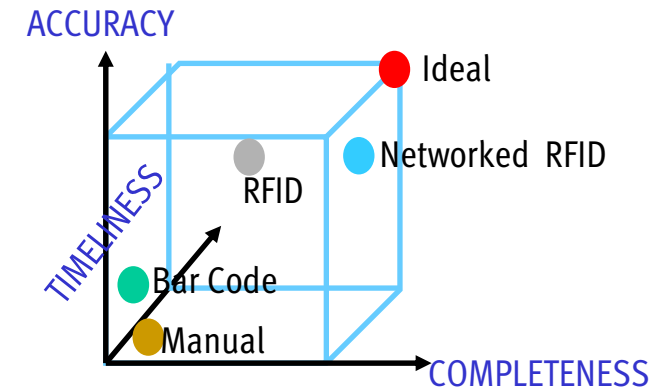
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# Cambridge Research Focus

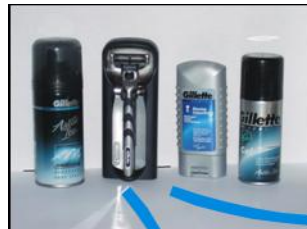
- Focus on managing ID information once on a network
  - EPCIS (EPC information service)
  - Distributed Product Information
- Closed Loop ID Systems:  
ID > Product Information > Decisions
  - Assessment of Product Data Quality
  - Impact of Product Information on business process
- Examining impact along supply chain
  - Business processes across the supply chain as a whole



# RFID and Late Customisation



*“The ability to delay the commitment to a particular customisation decision to the latest point in the order fulfillment process.”*

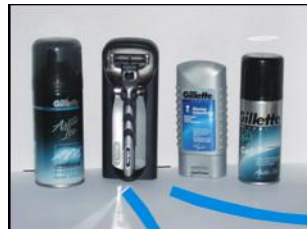


- Related to mass customisation
- Occurs in manufacturing, distribution, retail ...
- Late customisation requires
  - Flexible operations
  - Adaptable control logic
  - High fidelity sensing

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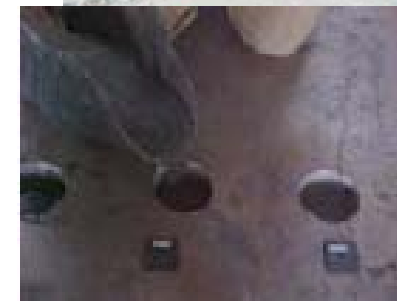
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  - Why a Research Programme
  - Current Programme Status
  - How to Get Involved





# FMCG: Situation Pre-1999

- **Technology:**
  - passive/active RFID, functional development,
  - UCC/EAN numbering systems
- **Applications:** asset based, single application, single company trials (P&G, Sainsbury, Gillette)
- **Standards:** tag level only, vendor oriented
- **Prices:** > \$0.50, a few established vendors
- **R&D:** technology oriented – no deployment research





# Auto ID Center: 1999-2003

- Programme: End User Driven, Cross Supply Chain, Standards Oriented, Deployment Driven

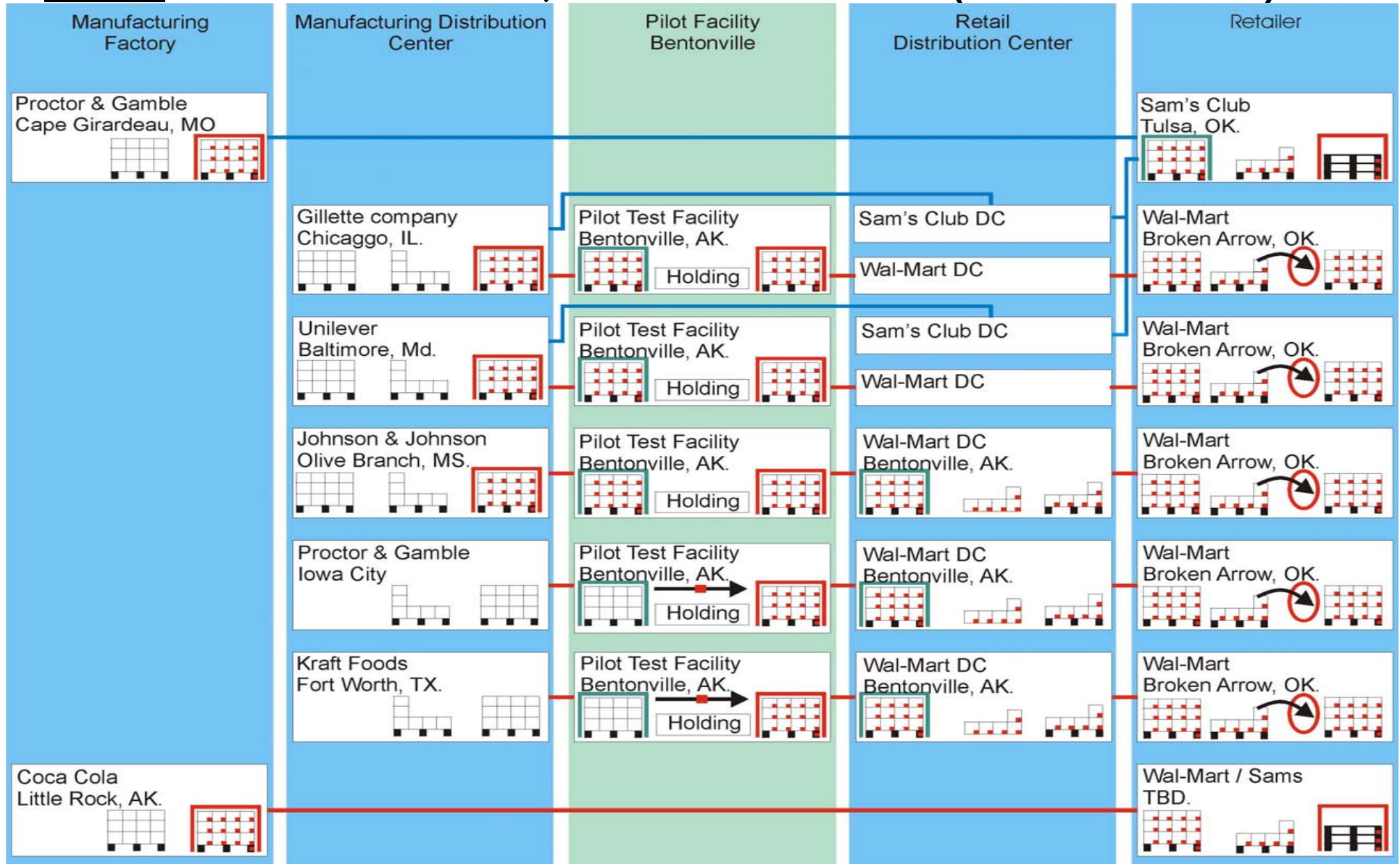


## Key Thrusts

1. **DRIVE TAG PRICE DOWN**
  - Minimal tag/network connect
  - High volumes
2. **GREATER BENEFITS PER TAG**
  - Multiple applications
  - Multiple Companies



# Auto-ID Center US Field Trial, Phase 2, Case Level (Feb 2002)





# FMCG: Situation Post 2003



Wal-Mart Supercenters range from 109,000 square feet to more than 260,000 square feet and offer shoppers a wide variety of goods and services.



**Technology:** low cost, passive RFID, cost focused developments

**Applications:** case based, multiple application, multi company pilots (Walmart, Metro, US DOD)

**Standards:** tag and all interfaces between ID and data, user driven (via EPCGlobal)

**Prices:** ~ \$0.05, a new emerging vendors

**R&D:** deployment oriented research (Auto ID Labs, Academic Alliance)



# Impact of Boeing/Airbus Initiative & Aerospace ID Programme?

- Programme: End User Driven, Cross Supply Chain, Standards Oriented, Deployment Driven



## Key Thrusts

### 1. APPROPRIATE TAG PRICES & FUNCTIONALITY

- Standardised, *Appropriate ID solution/ synchronised* network connect
- High volumes / common deployment

### 2. GREATER BENEFITS PER TAG

- Common applications & standards
- Multiple companies



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# Aerospace ID Technologies Programme

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- Aim: To remove barriers to widescale Automated ID deployment through timely and effective R&D
- Launching March / April 2005
- Approach: 18 month programme focussed on key research barriers
- *Synchronise research with industry initiatives such as Boeing/Airbus*





# Organisations in discussions around joining the project

- Airbus
- Boeing
- Bombardier
- Embraer
- Westland Helicopters
- BAE Systems
- American Airlines
- British Airways
- Korean Airways
- Virgin Atlantic and Virgin Cargo
- Asian Airlines
- Cathay Pacific
- Emirates
- Lufthansa
- Malaysian Airlines
- Singapore Airlines
- UK Ministry of Defence
- US Department of Defence
- General Electric
- GKN Aerospace
- Honeywell Aerospace
- Pratt and Whitney
- Raytheon
- Rolls Royce
- DHL
- FedEx
- UPS
- British Airports Authority
- Marshalls Aerospace



# Research issues raised in formation Discussions / Questionnaires

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- Lifecycle ID Management
- ID Technologies Application Matching
- Sensor Fusion
- RFID Enhanced Track and Trace
- Tag and Database Synchronisation





# Capability to deliver this programme

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- 6 Years experience in RFID in industrial driven research programme.
- Global research organisation – with a vast skill set that can be drawn upon
- Background in manufacturing, logistics & service
- Knowledge from the activities carried out in the FMCG
- History of working with the Aerospace Industry
- Impartial technical research organisation
- Can provide an interface to standards bodies





# Current Aero-ID Technologies Programme Team



Dr. Duncan McFarlane  
**Research Director**



Alan Thorne  
**Associate Director**



Dr. Mark Harrison  
**Associate Director**



Andy Shaw  
**Business Manager**



James Lyon  
**Programme Manager**



Dr. James Brusey  
**Senior Researcher**



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# Benefits for you in joining the Research Programme

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- Have access to the latest research findings
- Help steer the focus of the research programme around your needs
- Participate and gain knowledge from field trial activities
- Understand how this technology can enhance your operations
- Take part in an open research forum for the industry





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  - Current Programme Status
  - **How to Get Involved**



# Come to the next meeting!





# Contact us (Get Involved!)

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During the conference:

Alan Thorne (Associate Director)

[ajt@eng.cam.ac.uk](mailto:ajt@eng.cam.ac.uk)

Andy Shaw (Business Manager)

[as2@eng.cam.ac.uk](mailto:as2@eng.cam.ac.uk)

For further details please see our web site:

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or contact James Lyon (Aerospace ID Programme Manager)

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