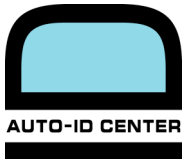

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AUTO-ID CENTER - VISION & TECHNOLOGY

Kevin Ashton, Executive Director, Auto-ID Center
Prof. Sanjay Sarma, Research Director, Auto-ID Center
Tokyo, January 22, 2003

AUTO-ID CENTER

- Founded 1999
- Research Labs at
  - Massachusetts Institute of Technology, USA
  - University of Cambridge, UK
  - University of Adelaide, Australia
  - Keio University, Japan
  - Fudan University, China
  - USG / ETH, Switzerland

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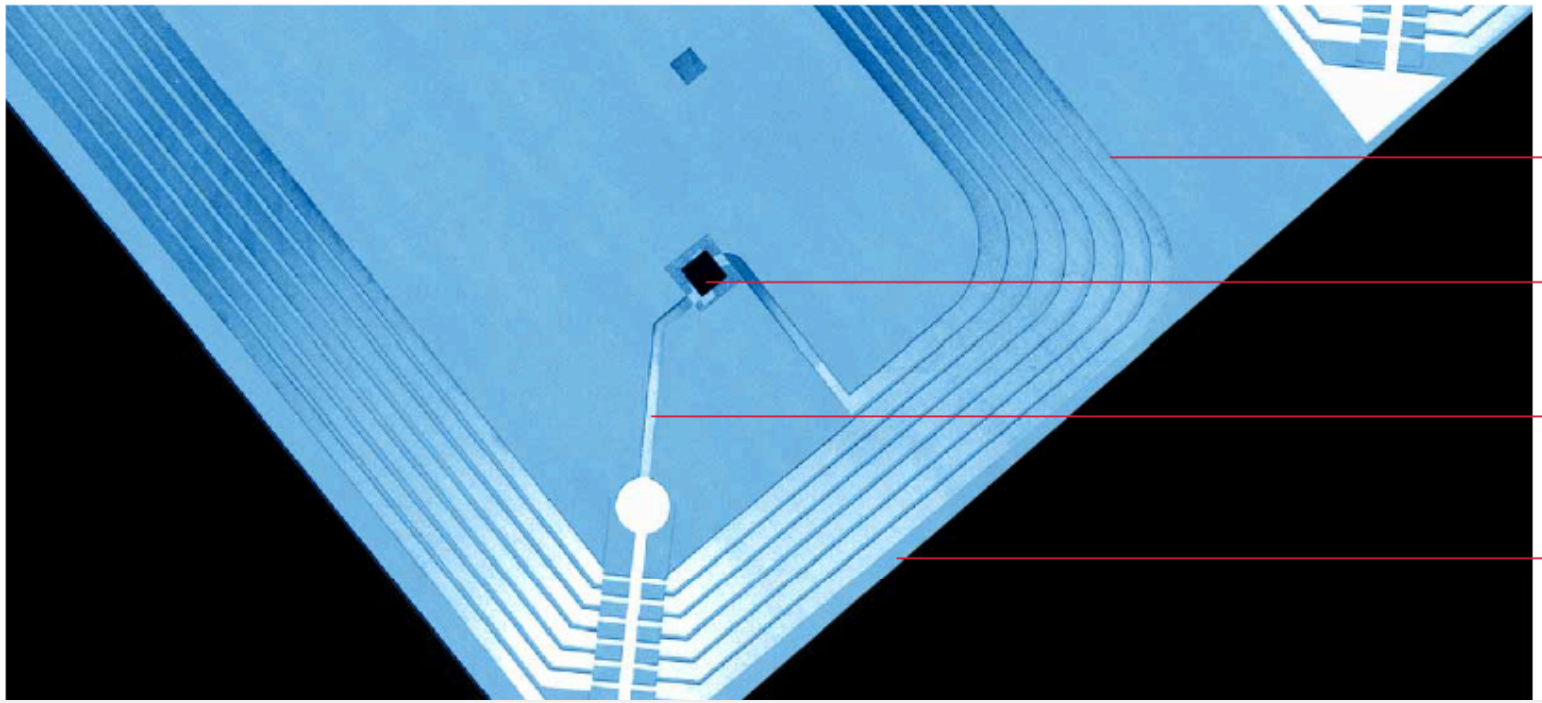
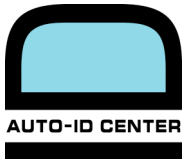


JAPAN-BASED SPONSORS

END USERS	TECHNOLOGY VENDORS
Canon	NTT
Dai Nippon Printing	NTT Comware
Mitsui & Co.	Toppan Forms
Toppan Printing	Toray International
	Sun Microsystems KK



ALL SPONSORS

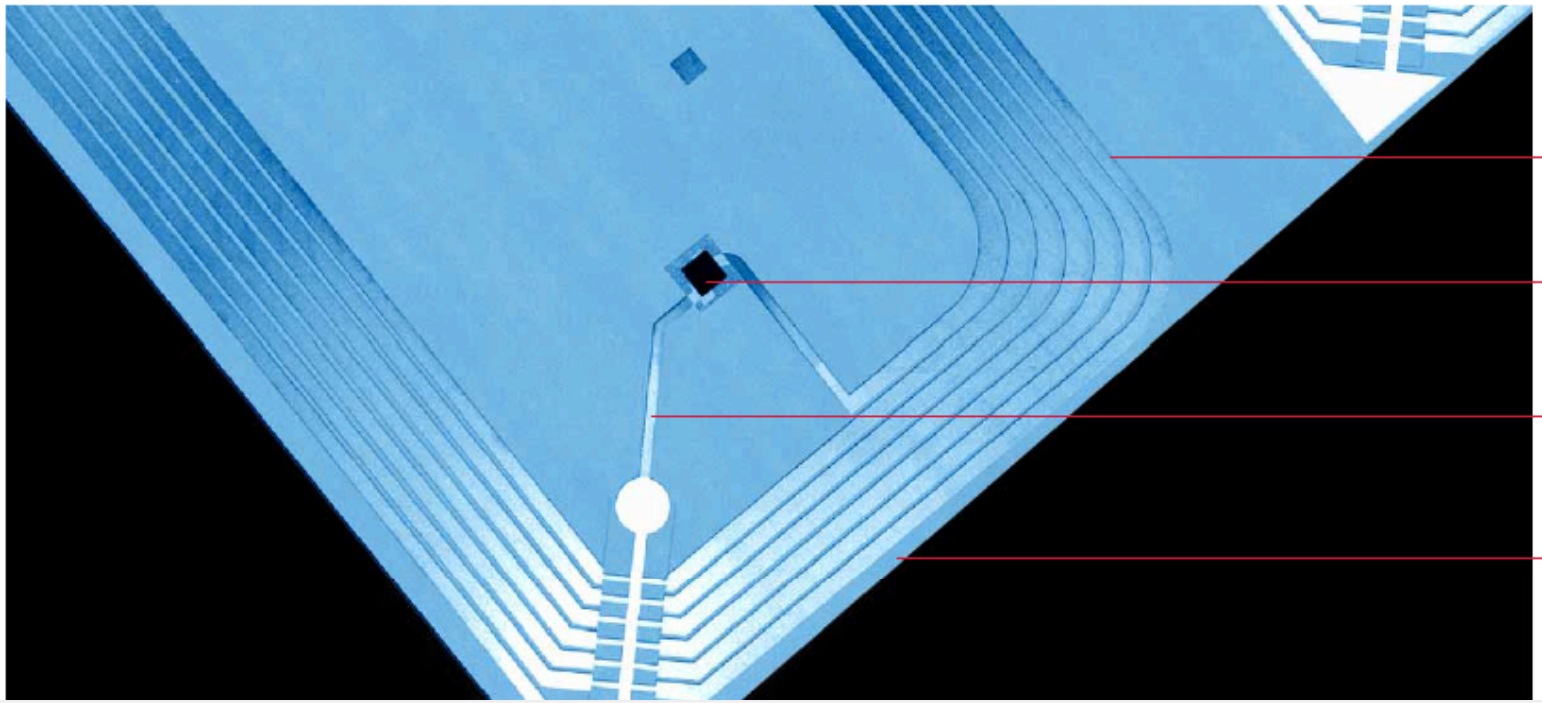
END USERS (39)

Abbot Laboratories
Ahold
Best Buy
CHEP
Canon
Coca-Cola
CVS
Dai Nippon Printing
Department of Defense
EAN International
Eastman Kodak
Home Depot
International Paper
Johnson & Johnson
Kellog's
Kimberly-Clark
Kraft
Lowes
Mead Westvaco
Metro
Mitsui & Co.
Nestle Purina
Pepsi
Pfizer
Philip Morris US
Procter& Gamble
Sara Lee
Target
Tesco Stores Ltd
The Gillette Company
Toppan Printing
Uniform Code Council
Unilever
United States Postal Service
UPS
Visy Industries
Wal-Mart Stores, Inc.
Wegman's
Yuen Foong Yu Paper Mfg. Co.

TECHNOLOGY VENDORS (49)

Accenture
ACNielsen
ADT / Sensormatic
Alien Technology
AWID
Avery Dennison
British Telecom
Catalina
Checkpoint Systems, Inc.
Composite Materials plc
Connecterra
Display Edge
Ember Corporation
Flexchip AG
Flint Ink
GEA
GlobeRanger
IBM
ID Tech Ex
Information Resources, Inc.
Intel
Intermec
Invensys
KSW
Manhattan Associates
Matrics
Markem Corp.
Morningside Technologies
NCR Corporation
Nippon Telephone & Telegraph
NTT Comware
OATSystems
Philips Semiconductors
Rafsec
RF SAW Components
SAMSYS
SAP
Savi Technology
Sensitech
Siemens Dematic Corp.
STMicro
Sun Microsystems
Symbol Technologies
TAGSYS
ThingMagic
Toppan Forms
Toray International, Inc.
Vizional
Zebra Technologies Corporation

AUTO-ID CENTER



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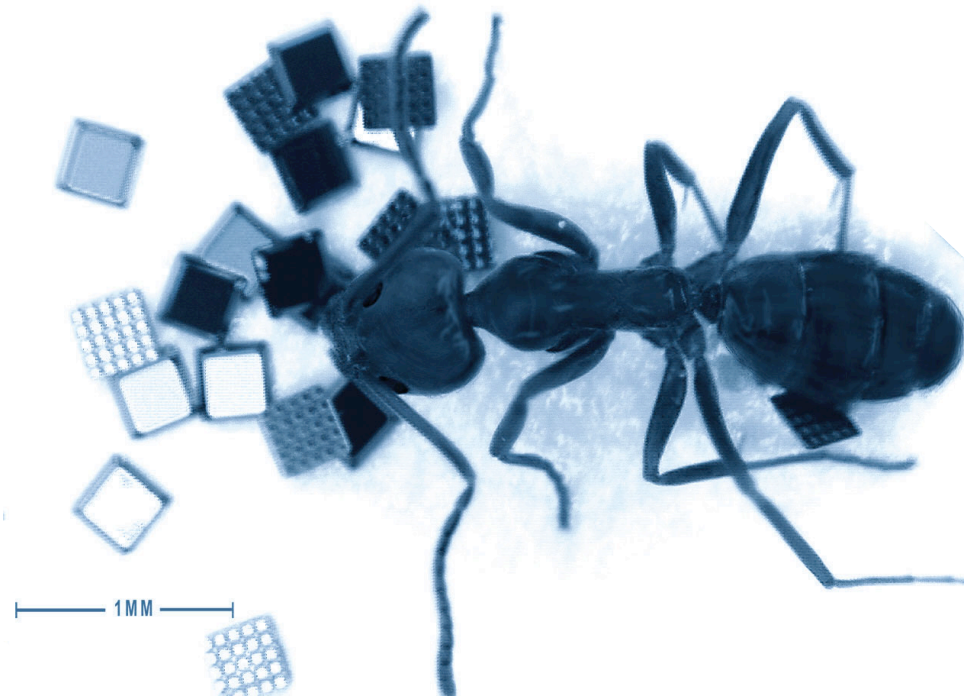


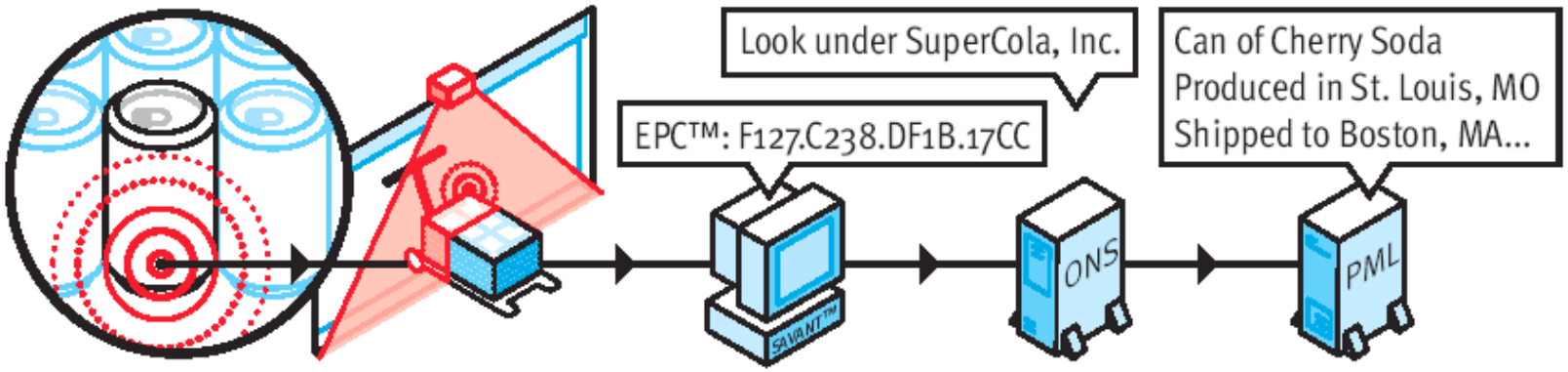
AUTO-ID CENTER

ELECTRONIC PRODUCT CODE

01.0000A89.00016F.000169DC0

Header	EPC Manager	Object Class	Serial Number
0–7 bits	8–35 bits	36–59 bits	60–95 bits

AUTO-ID CENTER

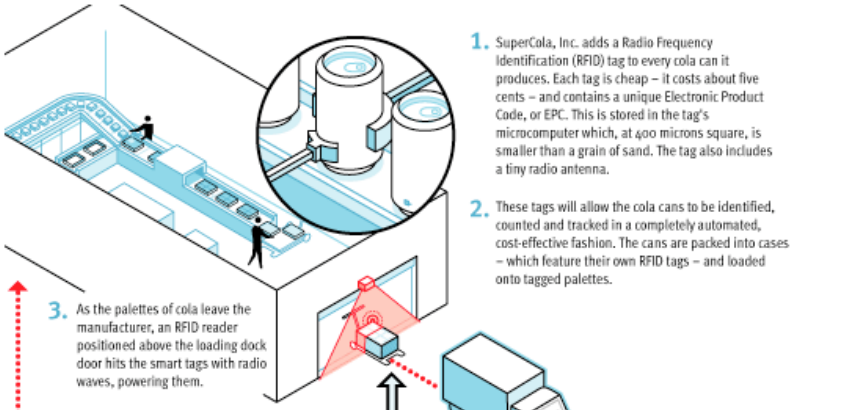


AUTO-ID CENTER

HOW THE AUTO-ID SYSTEM WILL AUTOMATE THE SUPPLY CHAIN

XPLANATIONS™ by XPLANE®

With Auto-ID technology, physical objects will have embedded intelligence that will allow them to communicate with each other and with businesses and consumers. Auto-ID technology offers an automated, numeric system of smart objects that revolutionizes the way we manufacture, sell, and buy products. Here's how it works:

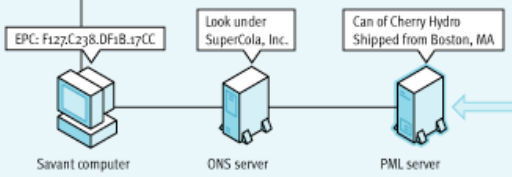


1. SuperCola, Inc. adds a Radio Frequency Identification (RFID) tag to every cola can it produces. Each tag is cheap – it costs about five cents – and contains a unique Electronic Product Code, or EPC. This is stored in the tag's microcomputer which, at 400 microns square, is smaller than a grain of sand. The tag also includes a tiny radio antenna.

2. These tags will allow the cola cans to be identified, counted and tracked in a completely automated, cost-effective fashion. The cans are packed into cases – which feature their own RFID tags – and loaded onto tagged palettes.

3. As the palettes of cola leave the manufacturer, an RFID reader positioned above the loading dock door hits the smart tags with radio waves, powering them.

4. The tags "wake up" and start broadcasting their individual EPCs. Like a good kindergarten teacher, the reader only allows one tag to talk at a time. It rapidly switches them on and off in sequence, until it's read them all.

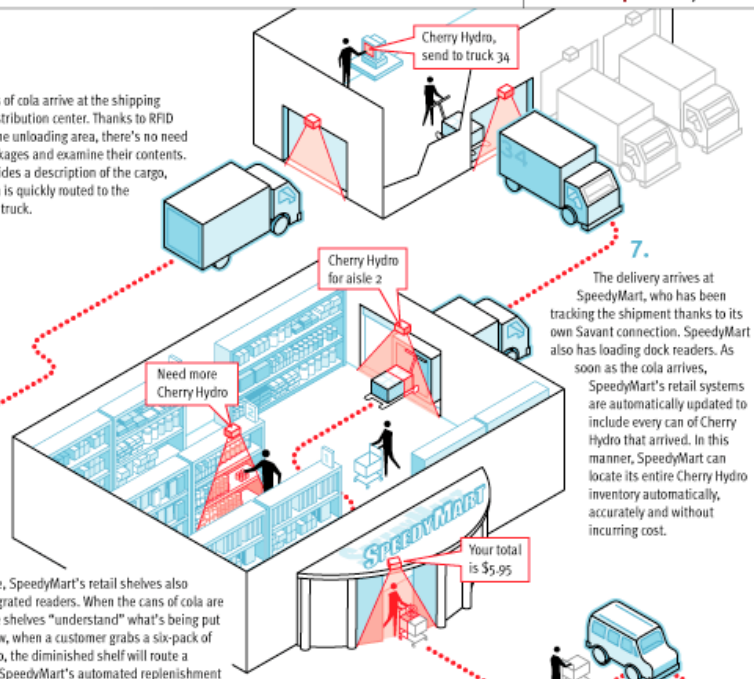


5. The reader is wired into a computer system running Savant. It sends Savant the EPCs it's collected, and Savant goes to work. The system sends a query over the internet to an Object Name Service (ONS) database, which acts like a reverse telephone directory – it receives a number and produces an address.

The ONS server matches the EPC number (the only data stored on an RFID tag) to the address of a server which has extensive information about the product. This data is available to, and can be augmented by, Savant systems around the world.

This second server uses PML, or Physical Markup Language, to store comprehensive data about manufacturers' products. It recognizes the incoming EPCs as belonging to cans of SuperCola, Inc.'s Cherry Hydro.

Because it knows the location of the reader which sent the query, the system now also knows which plant produced the cola. If an incident involving a defect or tampering arose, this information would make it easy to track the source of the problem – and recall the products in question.



6. The palettes of cola arrive at the shipping service's distribution center. Thanks to RFID readers in the unloading area, there's no need to open packages and examine their contents. Savant provides a description of the cargo, and the cola is quickly routed to the appropriate truck.

7. The delivery arrives at SpeedyMart, who has been tracking the shipment thanks to its own Savant connection. SpeedyMart also has loading dock readers. As soon as the cola arrives, SpeedyMart's retail systems are automatically updated to include every can of Cherry Hydro that arrived. In this manner, SpeedyMart can locate its entire Cherry Hydro inventory automatically, accurately and without incurring cost.

8. What's more, SpeedyMart's retail shelves also feature integrated readers. When the cans of cola are stocked, the shelves "understand" what's being put in them. Now, when a customer grabs a six-pack of Cherry Hydro, the diminished shelf will route a message to SpeedyMart's automated replenishment systems – which will order more Cherry Hydro from SuperCola, Inc. With such a system, the need to maintain costly "safety volumes" of Cherry Hyrdo in remote warehouses is eliminated.

9. Auto-ID makes the customer's life easier, too. Rather than wait in line for a cashier, she simply walks out the door with her purchases. A reader built into the door recognizes the items in her cart by their individual EPCs; A swipe of the debit or credit card and the customer is on her way.

10. At home, the refrigerator updates its records to reflect the influx of Cherry Hydro. As the cola is depleted, the fridge will add the beverage to its automated grocery list.

11. When the cola cans hit the recycling center, RFID readers will automate the process of sorting them into the appropriate recyclable category – eliminating expensive manual sorting. The cans can even be routed to their manufacturer for reuse at the plant.