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Radio-Frequency Identification (RFID)

Panorama of RFID

Current Applications and Potential Economic Benefits

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Potential Economic Benefits

Research firms report global shipments of RFID systems (hardware, software, and services) are growing:

- Research firm VDC Corp: market reached nearly \$1.8 billion (2004), will reach \$5.9 billion in 2008.
- The Wireless Data Research Group: market will grow from \$1 billion in 2003 to \$3 billion by 2007.
- Frost & Sullivan Research: European market will grow to over €5 billion in 2007.

The Promise of RFID

- Enable commerce, innovation, economic growth, and competitiveness.
- More efficient markets.
- Productivity gains.
- Customer convenience and products recalls.
- Better service.
- Expedite processing; no bar code line of sight required.
- Improve product visibility.

Transportation



EZPass SM
New Jersey Customer Service Center

Exxon SpeedPass

- Car toll transponders
- Access cards to facilities, subway systems
- Anti-theft keys for automobile
- Marathon timing chips



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Drug Safety

RFID tags on pill bottles

- quality assurance & anti-counterfeiting,
- reduce potential for unauthorized access and expedite drug recalls.

Healthcare

Blood tracking to ensure correct blood type.

- Patient tracking for location identification of Alzheimer's patients and babies.
- Medication and high value item asset tracking.
- RFID tags included on surgical devices.

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Food Safety

- Temperature sensors attached to fresh food and on perishable goods to monitor temperature ensure that products have maintained chill compliance throughout the supply chain. RFID can help to quickly identify exact products by batch code when recalls are necessary.
- RFID can be used to track food from point of origin, e.g. meat products.



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Transportation Safety

- Aviation: Delta Airlines using special RFID technologies to monitor the performance of aircraft engines to compare latest data with historical data to anticipate potential problems. Maintenance costs have been reduced by half.
- Autos: Designed to broadcast at regular intervals the temperature and pressure of each tire to the driver. Passenger safety and reduced wear on tires will save on fuel.

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Airport Safety, helping people do their jobs better.

- Frankfurt airport maintains 22,000 ventilation units with fire shutters designed to close automatically.
- The airport operator has mounted RFID tags on the fire shutters and equipped service technicians with hand-held readers to identify shutters, perform, and document maintenance work.
- Visual inspections are still used to confirm work. Annual maintenance savings of €100,000.

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Internal Business Applications

- HP is tagging cartons for PCs, printers, ink cartridges. Projected internal benefits include:
 - increased speed and efficiency of manufacturing and distribution;
 - improvements in transfer of pallet/case-level inventory between manufacturing and distribution center sites;
 - increased product offerings, including those tailored to toward individual solutions.

Panorama of RFID Current Applications

Retail Benefits

- Improved on shelf availability.
- Reduced inventory handling costs.
- Reduced warehouse facilities cost.
- Reduced waste.
- Increased display of products effectiveness.

Panorama of RFID Current Public Applications

Table 3: U.S. Government RFID Applications

Agency	Application
Department of Defense	Logistics support and material tracking
Department of Health and Human Services	Drug authentication
General Services Administration	Asset management and transportation
Department of Transportation	Freight and mass transport
Department of Homeland Security	Immigration, border control, and customs (US-VISIT), search and rescue, and disaster response
Department of Veterans Administration	Patient and supply chain tracking
Department of the Treasury	Records management
U.S. Postal Service	Mail security and tracking
National Aeronautics and Space Administration	Hazardous materials management
Department of State	Electronic Passports
Department of the Interior	Access cards
U.S. Department of Agriculture	Animal tracking for disease control

Source: US General Accountability Office (GAO).

Privacy and Security Perspectives

- Many current uses of RFID do not implicate privacy issues.
- Others are consent oriented e.g. EZ Pass.
- However, privacy concerns are complex and must be addressed for RFID to reach its full economic potential.
- Some worry the mere existence of RFID tags will lead to surveillance and data gathering.

- A strong comprehensive partnership is needed between industry, government, and civil society to create a voluntary self-regulatory solution that respects and protects the need for privacy and security, giving consumers the tools and choices they need to protect themselves, while sustaining innovation.

Privacy and Security Perspectives Continued

- Privacy and security are two sides of the same coin and must be baked in at the beginning to build trust and confidence.
- For an emerging technology like RFID to gain broad acceptance, accurate information about the technology, its benefits, applications, and the challenges are a vital component of our constructive and ongoing dialogue.

RFID U.S. Resources of Note

Department of Commerce
Workshop and Report (04/2005):
www.technology.gov/reports.htm

RFID Intra-government Council: a forum for exchanging information among federal agencies emphasizing government applications, privacy and security, standards, and regulatory matters.

Federal Trade Commission
Workshop (06/2004) and report (03/05).
<http://www.ftc.gov/bcp/workshops/rfid/index.htm>

Radio Frequency Identification

Opportunities and Challenges in Implementation

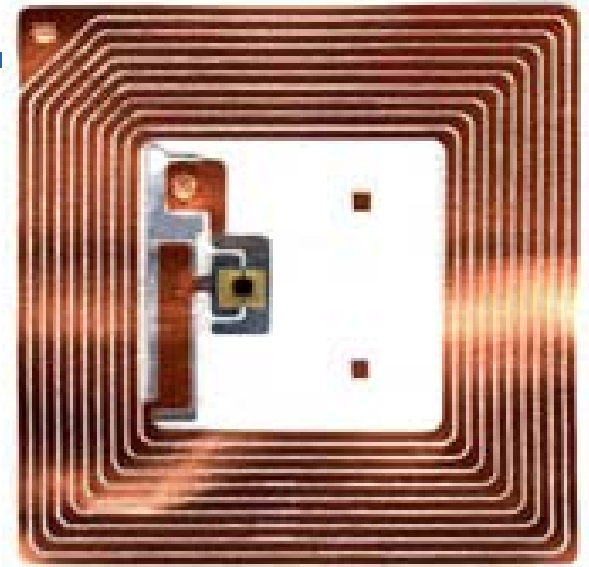


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The Future: RFID and the “Internet of Things”

- Some experts believe RFID will be one of a set of technologies representing a new way of doing business-- brought about by convergence in which computing, communications, and interactivity are available in most places through a world of wireless, sensors, and network computing.
- RFID has the potential to enable machines to identify objects, understand their status, and communicate and take action if necessary, to create “real time awareness.”





Thank You

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