RFID and Security





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Who We Are

- Supply Chain Research
- Supply Market Forecasts
- Supply Chain Consulting





Agenda

- Background on RFID
- Airport and Airline Applications
- Case Studies
- Conclusions



Background on RFID

In use for 65 years

- 1940s Friend or foe
- 1960s Electronic Article Surveillance (EAS)
- 1970s Automated toll collection
- 1980s Automatic Equipment Identification
- 1990s Keyless entry, 1990s Speedpass™
- 2000s EPC, Smart cards, and more





The Wal-Mart mandate

LOGMARS and EPC Mandates

- 2003 EPC standard
 - Albertson's
 - Best Buy
 - Coca-Cola
 - Department of Defense
 - Gillette
 - Target
 - Wal-Mart



Wal-Mart Current Status

- Top 300+ suppliers→600
- 23,753+ tagged pallets
- 663,912+ tagged cases
- 5 million+ tag reads
 - > 90% for cases on carts
 - 95% on conveyors in DCs
 - 66% on cases in pallets
- RFID data available to suppliers within 30 minutes via extranet



A flurry of pilot programs

Non-Airline Deployments

Used For:

- Chevrolet
- Good Shepherd Hospital
- Marks & Spencer
- MasterCard
- Pakistan passports
- Port of Long Beach
- Purdue Pharmaceutical
- Shanghai Masters Cup
- Tesco
- TNT Logistics
- UPS
- Velje bus terminal
- Virginia drivers license

- Tracking Equipment
- Tracking Inventory
- Deploying Labor
- Tracking Production
- Tracking Devices
- Monitoring Access
- Speeding Interactions



Some negative ROIs

Large Retailer

- Problem: Out-of-stocks
- Solution and Cost: x
- Benefit: Up to 0.4x
 - 10-20% fewer out-ofstocks (stock-outs = 3-8% of sales)
- ROI: 15% to 170% (depends on stock-outs)

Large CPG Company

- Problem: Compliance
- Solution Cost: 0.12x
- Benefit: 0.009x
 - Labor savings at DCs
 - Deductions
 - More promo sales due to fewer out-of-stocks
- ROI: -7% (before deductions, promos)





Some positive ROIs

- Orthopedic implant mfr.
- Problem: Pipeline stock of
 high-value inventory
- Solution:
 - 250,000 items tagged
 - 7 tunnel readers
 - Software
- Benefit:
 - 5% savings on inventory @ 10%
 - 20% less overtime counting returned items
- ROI: 101%

- Hospital
- Problem: Misplaced medical equipment inflates asset rental costs
- Solution:
 - Active tags on each device
 - Central reader
- Benefit:
 - 5% reduction in 30-day leases
- ROI: 107%



Airport and Airline Applications



Security and service are key drivers

- Ensure security
- Enhance service to customers
 - Asset utilization
- Reduce cost of lost baggage
 - Claims
 - Manpower

Objectives of Implementation



Source: Boston Logistics Group survey



Wide variety of applications

RFID Applications

Application	Benefit	Financial Metric
Track Equipment	Utilization ↑	ROA ↑
Track Inventory	Turns ↑	Working Capital ↑
Deploy Labor	Productivity ↑	Profits ↑
Track Production	Cycle time ↓	Revenues ↑
Track Devices	Availability ↑	Performance ↑
Monitor Access	Violations ↓	Claims/damages ↓
Speed X-Actions	Throughput ↑	Revenues ↑
Inter-Operate	Applications ↑	Revenues ↑



Challenges to recognize

- Standards
 - China: UHF 840 MHz-925 MHz
 - Europe: UHF 860 MHz
 - US UHF 920 MHz
 - ISO HF 18000-3 and UHF 18000-6 tags
- Investment cost
- Interlining
- Interference
- Privacy



Case Studies



Cargo and baggage pilot programs

Airports

- Amsterdam Schiphol
- Atlanta
- Boston
- British Airports
- Emirates
- Hanover
- Hong Kong
- Honolulu
- Jacksonville
- Narita

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Airlines

- Air Canada
- Air France/KLM
- British Airways
- Continental
- Delta
- FedEx
- Japan Airlines
- United



Deployments

- Madrid put in a pilot program that generated read rates of 99.8%, and Air France's Amsterdam-Paris trial is having a 100% read rate, according to sources. The new deployments include, for example:
- Thailand's Suvarnabhumi Airport decided to deploy RFID. Thai Airport Ground Services (TAGS) is targeting a 15-20% reduction in logistics cost and a 66% increase in the velocity of cargo transiting the free zone.
- Britain's Heathrow Airport is testing RFID behind selected check-in desks.



Deployments (continued)

- Airports of India (AAI) introduced plans to implement RFID at four airports by 2009. Also looking at RFID. Talking to hardware and software vendors to shop a solution.
- Korea Airports deployed an RFID solution from UPM Raflatac. It bought 350,000 UHF EPC Generation 2 inlays. Their \$3.3m budget has covered 98 readers and 85 printers at Gimpo, Korea and Haneda, Japan. The tag being used is designed to be relatively insensitive to the direction of the baggage, partly because of its dipole antenna design.



Recent vendor activity

- IBM and Vanderlande Industries to manage a program that will implement RFID as part of a larger scheme to increase baggage handling efficiency through robotics at Schiphol airport.
- UFIS Airport Innovation is setting up a consortium of suppliers to demonstrate the value of RFID to transportation service providers. It is relying on its experience deploying RFID in baggage handling at Oslo's Gardermoen Airport. The consortium of vendors includes RFID Lab Norway, UPM Raflatac Finland and the Nordic Innovation Center.
- IER is supplying Paris Charles de Gaulle airport with a full solution including hardware (including IER's 506 RFID bag tag printers), software, and tags.
- Matrics will supply Hong Kong with tags and readers, according to the head of Technical Services and Procurement at the Airport Authority of Hong Kong.



San Francisco Airport

- Scope of application
 - Since 2001
 - International terminal
 - Selected passengers
 - 4 portals = 5-10% of bags
- Tags and readers
 - SICK Stargate dual barcode/RFID portal
 - EPCGlobal tags
 - Singulation with validation

<u>ROI</u>

- Capital paid-in by Department of Homeland Security
- Low operating expenses
- Could be justified on labor savings



Las Vegas Airport

- 73,000 bags per day
- 35,000 on RFID today
- \$125 million program
 - 6 buildings, conveyors, RFID antennas
 - \$94 million from Transportation Security Administration
- 100 million Matrics tags
 - 5-year agreement for Symbol tags and readers
 - Not EPCGlobal
- Cooperation with Amsterdam and Narita
- 99%+ read rate



Conclusions



Growth will continue

- Security imperative
- Lower costs



RFID Market Size

Consumer convenience
 Track emergency resources
 Track inventory
 Track equipment



Source: Boston Logistics Group, Inc. Note: Excludes consulting services

- Baggage handling at hub interchanges
- Cargo handling at the container level
- Needs strong base of "anchor tenants" to encourage widespread adoption



Action plan

- 1. Conduct a preliminary ROI assessment to verify that volume and scale warrant a pilot
- 2. Launch a pilot to establish accurate cost and operational baselines
- 3. Independently validate pilot success and expansion potential
- 4. Deploy based on standards
- 5. Target and measure improvements in customer satisfaction and loyalty



Global Supply Chain Economics

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- Research that helps investors and policy makers identify emerging issues that affect their supply chains, and quantify the impact that they will have
- Analysis that helps financial and operational managers plan and budget by providing benchmark, best practice, and forecast data tailored to their companies' supply chains
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