

RFID

Going forward in Aviation & Transportation

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RFID Revolution ?

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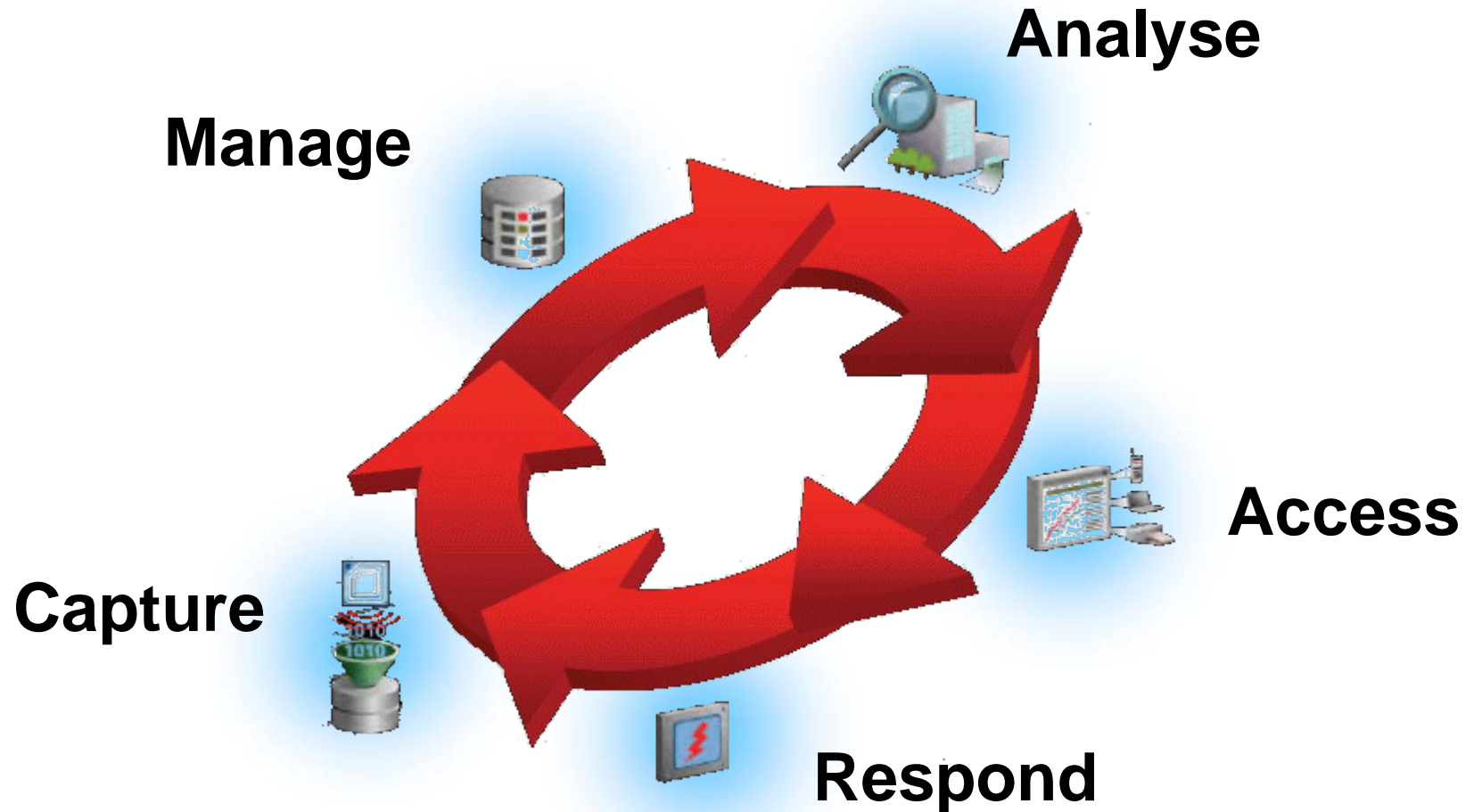
**RFID is a Business Revolution
NOT a Technology Revolution**

**Technology is “just” a Enabler for new
meshed Realtime Business Processes**

Industry Mandates are driving Adoption



Capturing Data is only the first Step



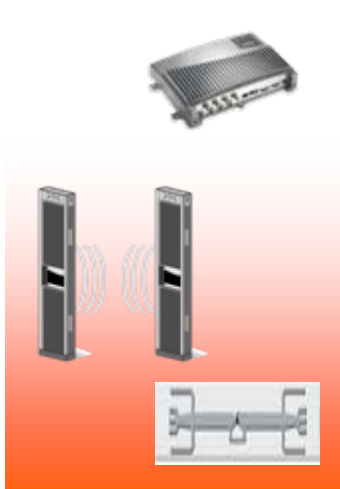
RFID must integrate SEAMLESS into the Enterprise



RFID Systems - Going forward



PHASE 1



**RFID Systems
that Work**

PHASE 2



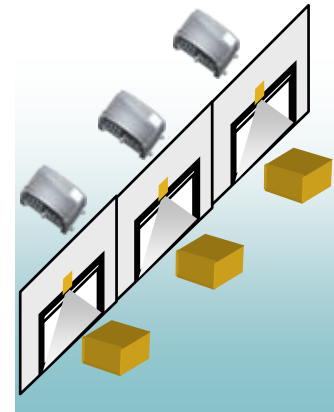
**Deployable &
Manageable
RFID Systems**

PHASE 3



**RFID Systems
essential to
business flow**

PHASE 4



**Ubiquitous
RFID Systems
across the
supply chain**

PHASE 5



**RFID Systems
transparent to
IT and
Operations**

Make it
WORK

Make it
MANAGEABLE

Make it
ESSENTIAL

Make it
UBQUITOUS

Make it
TRANSPARENT

Integrating RFID into the Network



“Things” become networked by adding ID-Tags

“Information” becomes networked by adding Sensor-Tags

Thick Client

Distributed Architecture

Enterprise-Scale Front-End

Enterprise-Scale Back-End

Enterprise-Scale Management

Enterprise Network

Enterprise Mobility Web

Network Element

Edge Intelligence

Enterprise Management

Mobile Networks

Sensor Networks

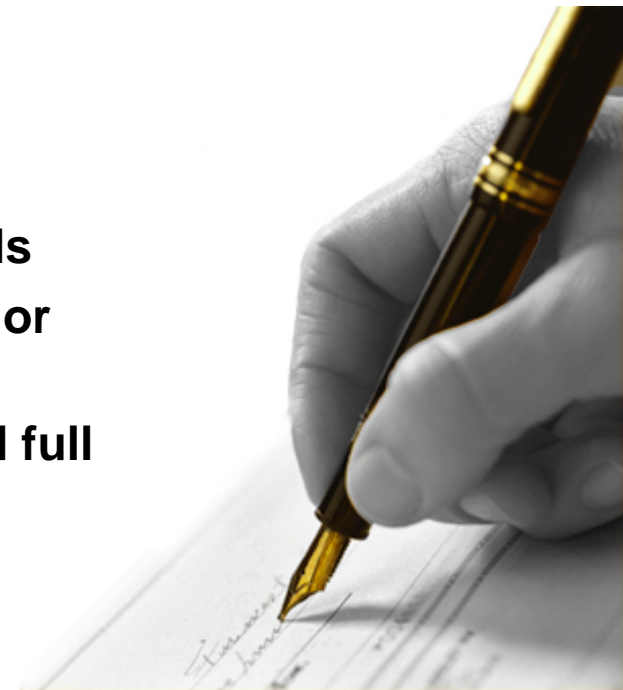
Focus is shifting



- **Standards ensure that a broad array of products exists to meet the needs of endusers**
- **Over time tight Standards will shift product differentiation from today's RF-Centric focus**
- **True differentiators will be factors like:**
 - **Full Integration in the Enterprise**
 - **Industry standard OS & APIs**
 - **Hardened and secured to counter any threat**
 - **Low lifetime costs due to easy deployment, manageability & maintenance**
 - **Turnkey Solutions for common tasks i.e Portals**
 - **Fully integrated rugged Handhelds with superior connectivity and battery life**
 - **Integration with location-awareness, voice and full mobility services throughout the enterprise**



Symbol is committed to EPC Standards



Packaged solutions are a critical enabler

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- **Conveyer Systems**
allow instantaneous routing of cartons
- **Dock Door & Portal Readers**
motion sensors and alarms ensure correct pallet placements
- **Forklift Readers**
track inventory location
- **Multi-mode Handhelds**
for workers who manage exceptions



MC9000-G Rugged Handheld
with RFID, Barcode, & WLAN



Conveyor Reader System*

*Source: FKI Logistex



Applications & Case Studies

RFID is delivering real returns for Enterprise today



RFID Enterprise Deployments

Supply Chain | Retail | CPG

- Wal*Mart
- Target
- Albertsons
- Best Buy
- Staples



Industrial Manufacturing

- International Paper
- Boeing
- Pacific Cycle



Pharmaceutical Manufacturing

- HD Smith
- Purdue



DOD

- Two DLA distribution centers on-line
 - San Joaquin, CA and
 - Susquehanna, PA



Aviation

- McCarran & Hong Kong Intl. Airports
- Asiana Airlines
- Virgin Atlantic
- Boeing



Next Generation of Airport Technologies

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ISSUE

- Extensive time check-in and go through security
- Un-reliable process to ensure passenger-bag matching

SOLUTION

- RFID-enabled security cards w/ biometric authentication processes
- Readers that authenticate traveler at check-in, security & boarding
- Tag on luggage for passenger identification

RESULTS

- Better security
- Improved speed & efficiency of checking & boarding



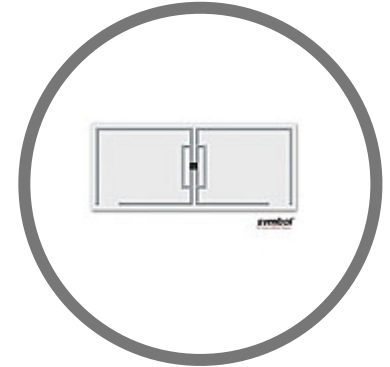
Automated Baggage Handling

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BUSINESS ISSUE

Accurately route checked passenger bags for screening and on to the airplane

Efficiently transfer bags to reduce turnaround time for planes at hub airports



SOLUTION

Reduce the amount of resources required for error and exception handling



BENEFITS

Baggage routing accuracy at 99.8% vs 90% with barcodes *

Accelerates aircraft turn-around time



Passive, UHF RFID: Worldwide Platform for Aviation Applications

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Transportation
Security
Administration

McCarran Intl. Airport

McCarran handles
65,000 to 70,000
bags per day

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Problem

Needed a way to track passenger bags on conveyors to screening machines and eventually on to the specific plane.

Bar Code line of sight and volume issues

Because of the random orientation of the bags, bar codes can be mis-scanned 15 percent to 30 percent of the time

Solution

- Symbol RFID bag tags provided near 100% visibility regardless of speed and orientation
- Symbol EPC RFID readers & reader stations

Benefits

- **Increased Customer Service and Safety**
- **End-to-end baggage visibility.**



Symbol Aviation Tag



McCarran was the first airport to commit to all bags, all airlines...

Hong Kong Intl. Airport



Problem

Inefficient Process of Tracking bags into right ULD

Volume Handling; 16 Million transfer bags per year

Poor baggage visibility
as baggage moves from conveyors to screening machines to planes.

Solution

- Symbol RFID solutions for Baggage carousels, ULDs, conveyors and mobile applications
- 5 year Contract, all airlines, all baggage, over 100 conveyor lines, 200+ RFID reader arrays

Benefits

- **Improved customer service**
- **Eliminates manual scanning during loading**
- **Reduce load time & cost**
- **Automatic electronic Container Manifest**
- **ULD to bag location & Validation**

HKAA's is Asia's largest RFID project

Bag's Bar code(s) & RFID Tag reading

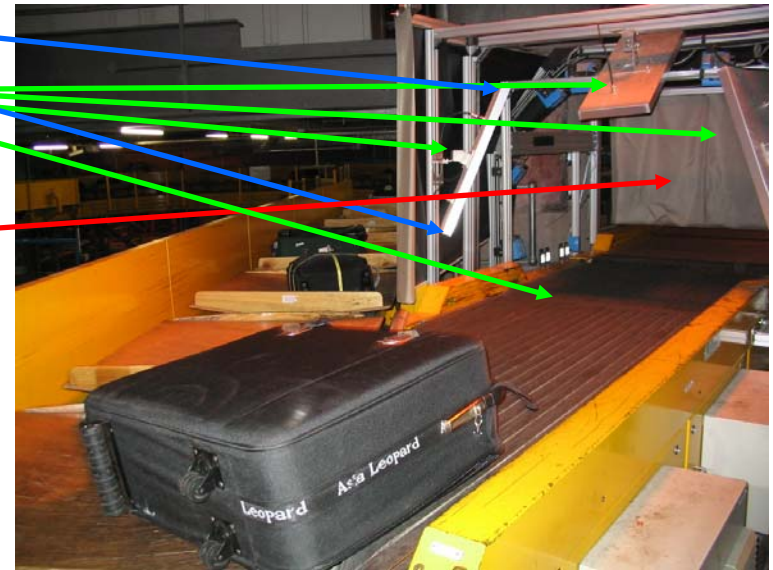
- 10/12 scanners
- AR400 with 4 antennas
 - 1 antenna under belt
- RF curtain
- System matches bar code LP & tag LP

Scan errors: up to 15%

- Manual scanning

RFID superior to bar coding

- > 95% read-rate



Technical Issues & Lessons learned:

Fit into environment designed for scanners

- Unable to perfectly locate antennas
- Unable to modify conveyor operation
- Unable to install “RFID tunnel”

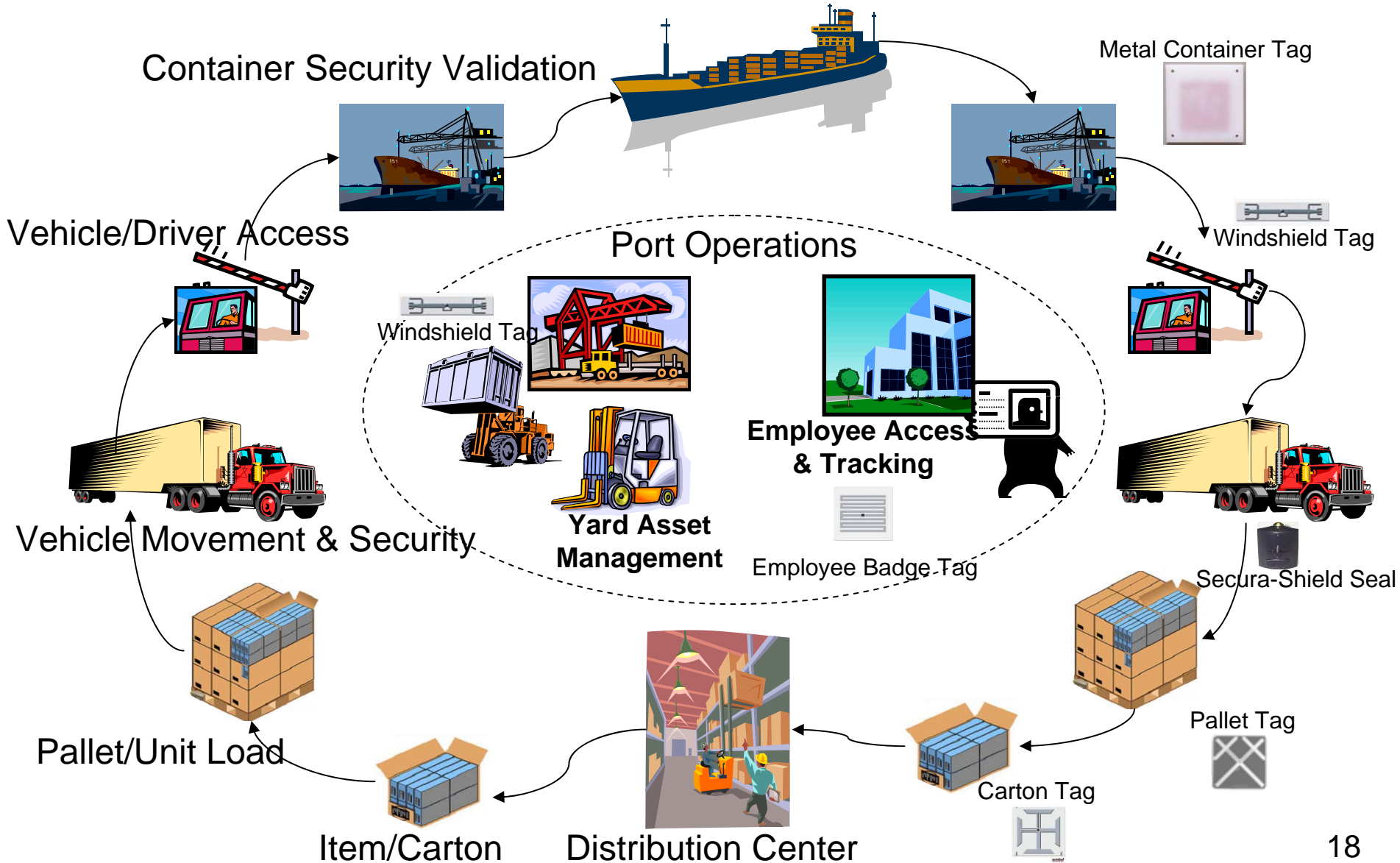
Positioning & Gain of antennas critical

Tag read issues

- Tags read before reaching read point
- Tags read when passing on adjacent conveyor

“RF curtains” used to limit “RFID Footprint”

Port Operations : Passive UHF



“Secura-Shield” Description

- **ISO/PAS 17712 compliant RFID container seal**
- **EPC (Class 0 or Gen 2) compliant**
- **Incorporates an industry standard ISO bolt seal manufactured by EJ Brooks**
- **Designed to comply with homeland security initiatives**
 - **C-TPAT**
(Customs-Trade Partnership Against Terrorism)
 - **OSC**
(Operation Safe Commerce)
 - **CSI**
(Container Security Initiative)
- **Disposable one time use device, cannot be counterfeited or reused**
- **Designed for long read ranges >7m**



Conclusions

Major Areas for Passive UHF in APAC

- **Vertical Industry Applications:**
 - Transportation & Logistics
 - Manufacturing
 - Security and Access Control
- RFID provides opportunities for companies to use the technology to “**leap frog**” in delivering efficiency gains
- Theft, shrinkage, counterfeiting and stock-outs are addressed
- RFID is about **Automation**
 - Automation brings **Visibility**
 - Visibility brings **efficiency and control**
 - Efficiency and control brings **profit**

- **Delays in regulatory decision making**
- **Shortage of qualified experts, technical & business process consulting**
- **Lack of credible industry training and certification programs**
- **Lack of information sharing about experiences and ROI benefits**
- **Difficulty for companies to prove ROI**
- **High cost of readers, tags and middleware applications**
- **IP ownership Litigation causing customer concerns and delays**
- **Benefits and capabilities of technology oversold**
- **Implementation not approached from a “Systems Perspective”**
- **Lack of packaged and integrated solutions**

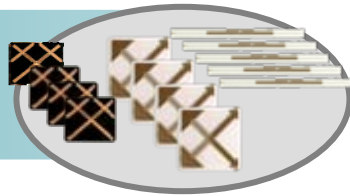
Symbol offers the complete solution for RFID



A Systems Approach to RFID

Tags

UHF Tags that meet performance/cost needs



Readers

Multi-protocol fixed & handheld readers



Antennas

Array of UHF Antennas



Systems

Application Specific Systems for Scale Deployments



Services

EXPERIENCE to take you from pilot to deployment



Broad Partner Ecosystem

...for Total Solution Delivery



Thank You

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