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Finding your way to RFID ROI in your Supply Chain - Airline industry case study

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**LA PUISSANCE AU CŒUR DE LA SUPPLY CHAIN
THE POWER OF SUPPLY CHAIN**



- Air France: one of two airlines in the Air France KLM Group
 - World leader in terms of turnover, international passenger traffic, cargo activities
 - Number 1 in Europe for passenger traffic
 - Key figures : 23.1 billion euros in turnover, 73.5 million passengers, 1 800 flights per day, 247 destinations in 107 countries, 569 aircrafts in operation, 103 000 employees
- AERA.aero Consultants
 - Management and IT consultants assisting major clients in aerospace & defense, airlines, high tech & manufacturing
 - Expertise: track and trace in logistics and maintenance, RFID

- Context and history of RFID in the airline industry
- RFID pilots by Air France KLM
- Building the RFID business case
- Questions

A bit of history...

- RFID originally appeared during World War II when radar was invented. Radars initially could not distinguish British and German planes.
- IFF (identification friend or foe) was introduced to differentiate radar signals



Air France - KLM aircrafts of course have IFF but that is not what we will talk about today.

- Low margins
- Large investments, human resources
- No way to stock "production" (transport)
- Multiple partners and sites

On-going optimization of costs & processes

- Role of RFID for Air France - KLM :
 - Automate and systematic data collection
 - Cost-effective tracking points
 - Speed and volume of data collection
 - Flexibility and speed of operations

1990's: introduction of RFID in airports

- 125 kHz RFID tags were first used in automatic sorters at CDG to carry, stock and dispatch baggage on trays
- This is similar to factory-use RFID



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- The same technology was introduced the Air France Cargo warehouse at CDG (G1XL) to manage automatic carts and track pallets



For these applications, Air France KLM has over many years of experience of RFID in operations

2003: first baggage RFID trials

- 125 kHz is ruled out to identify baggage on conveyors.
- In 2003, it was still too early for UHF.
- First trials were done with 13.56 MHz tags at Amsterdam, Narita, San Francisco...



This technology usable worldwide was initially attractive but did not deliver performance

- In 2004, IATA (International Air Transport Association) launches the StB Program (Simplifying the Business)
 - CUSS (Common Use Self Service kiosks)
 - e-ticket
 - BCBP (Bar Coded Boarding Pass)
 - **RFID**
 - e-freight
- RFID objectives in StB
 - Support RFID pilots, confirm business case for baggage RFID
 - Provide consulting on other RFID opportunities in the industry
 - Ensure coordination with ACI (Airports Council International)

This decision signaled that RFID investments are globally supported and therefore be less risky

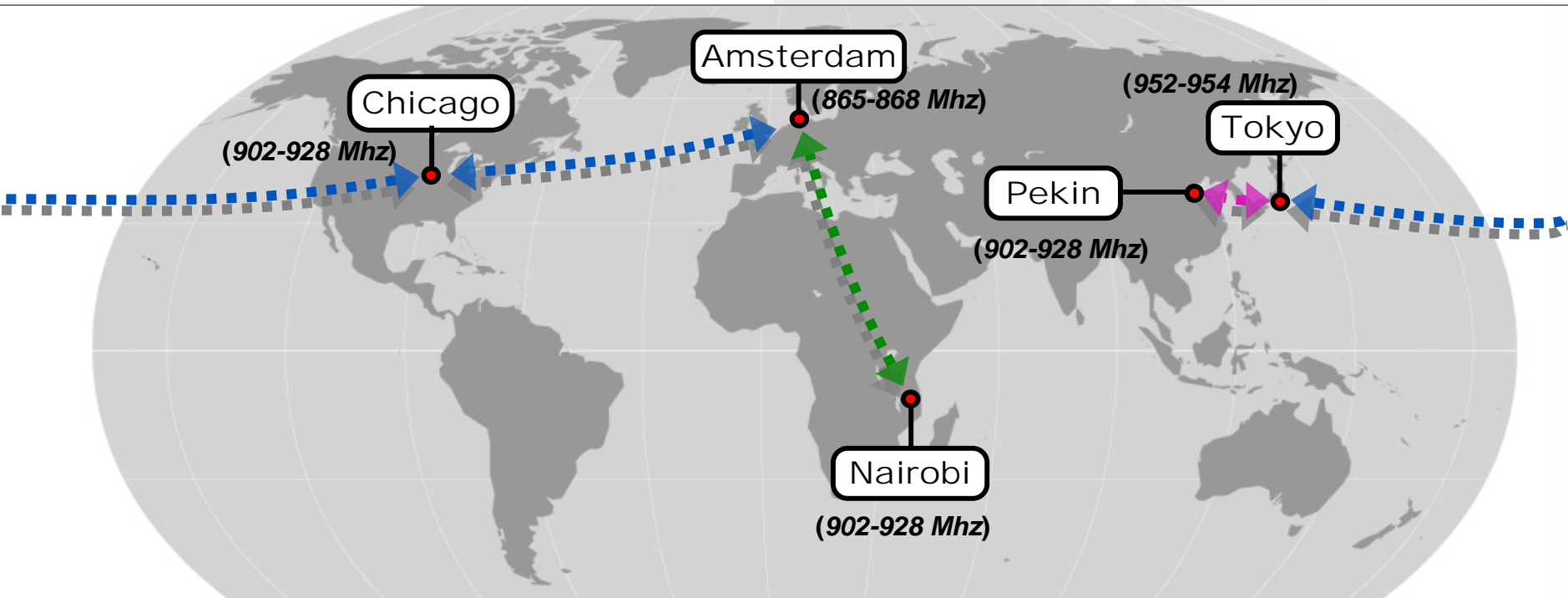
2005: large RFID trials

- UHF tags (EPC class 0, class 0+) are introduced in Hong-Kong, Las Vegas, San Francisco and achieved good results



Hong-Kong and Las Vegas went ahead with local roll-outs but the industry still needed a standard

- US Transportation Security Agency (TSA) & IATA conduct RFID reading & writing tests with passive UHF tags



Through test baggage, UHF was proven to be usable in all regions (and frequencies) of the world

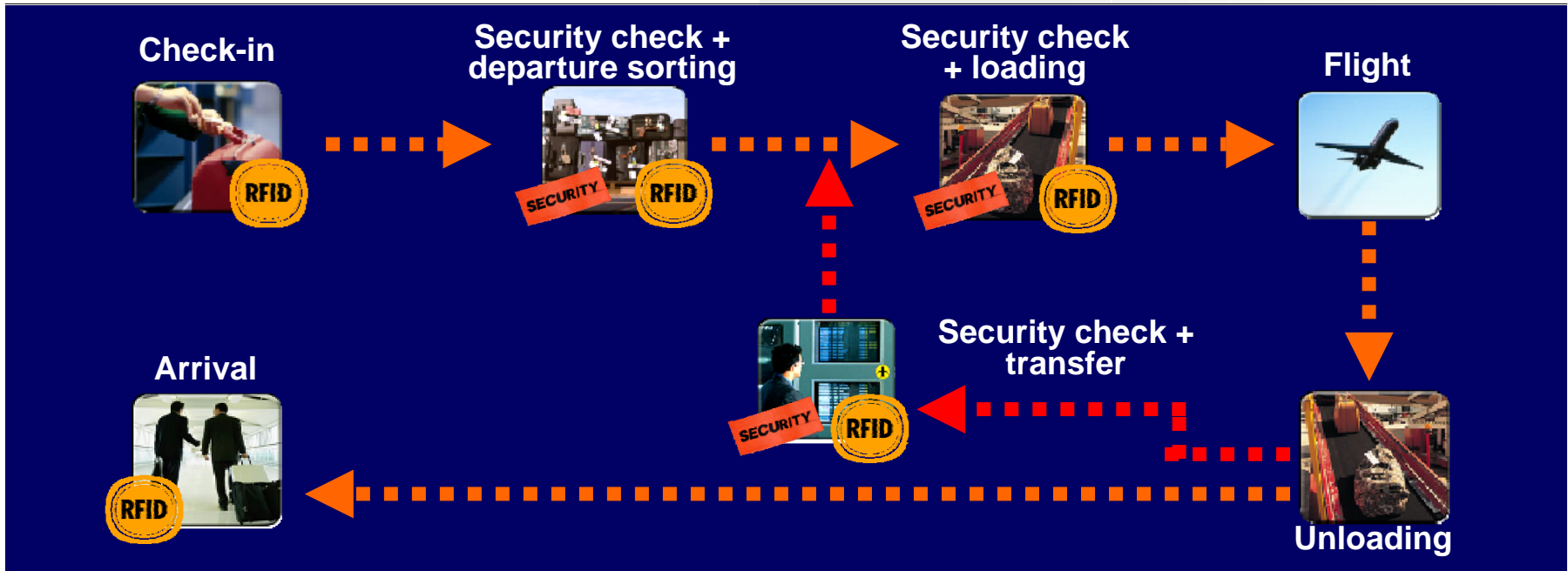
- The IATA Baggage Working Group (BWG) produced the Recommended Practice 1740C defining RFID for interline baggage tags
 - ISO 18000 6C for the air interface : consistent with EPC (Class 1 Gen 2), using passive UHF tags, proven safe in aircrafts, allowing multiple read/write
 - ISO 15961 and 15962 for encoding

Object Identifier	Object	Memory Bank
1 0 15961 12 1	License Plate Code (10 chiffres)	01
1 0 15961 12 93	Door to door Service Delivery Company	11

The airline industry now has the open standard (ref. ISO) it needs for its supply chain

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- From the start, project scope includes the whole baggage handling process from check-in to arrival, with a strong emphasis on transfers



Is RFID reliable enough for airlines? Can we use the data effectively to sort, track and trace baggage?

July 2006: RFID check-in

- On July 3rd 2006, Air France at CDG T2F1 and KLM at AMS T2 officially launch RFID check-in
- The launch is communicated widely to passengers through the the press and media, and on check-in counters with specific signs



Air France, KLM and their hubs are the first to implement the IATA RFID standard

- Amsterdam installs a first RFID tunnel reader in its departure pre-sorter under terminal 2 with the aim to replace bar code scanners



From the start, infrastructure and logistics flows specificities drive RFID tunnel installations

- Monitoring container movements is key to baggage flow management to and from the different sorting areas
- A pilot door is set up at a short connexion sorter to validate in operations UHF RFID on containers



Air France is thus the first airline to extend the IATA RFID standard to containers

- Two tunnels are installed to identify baggage tags traveling on the "hubway" between AMS and CDG
- A partnership with Narita Airport Authority and ASTREC research consortium allows to do the same with Japan



Interoperability between different frequencies and equipments is validated on a real scale

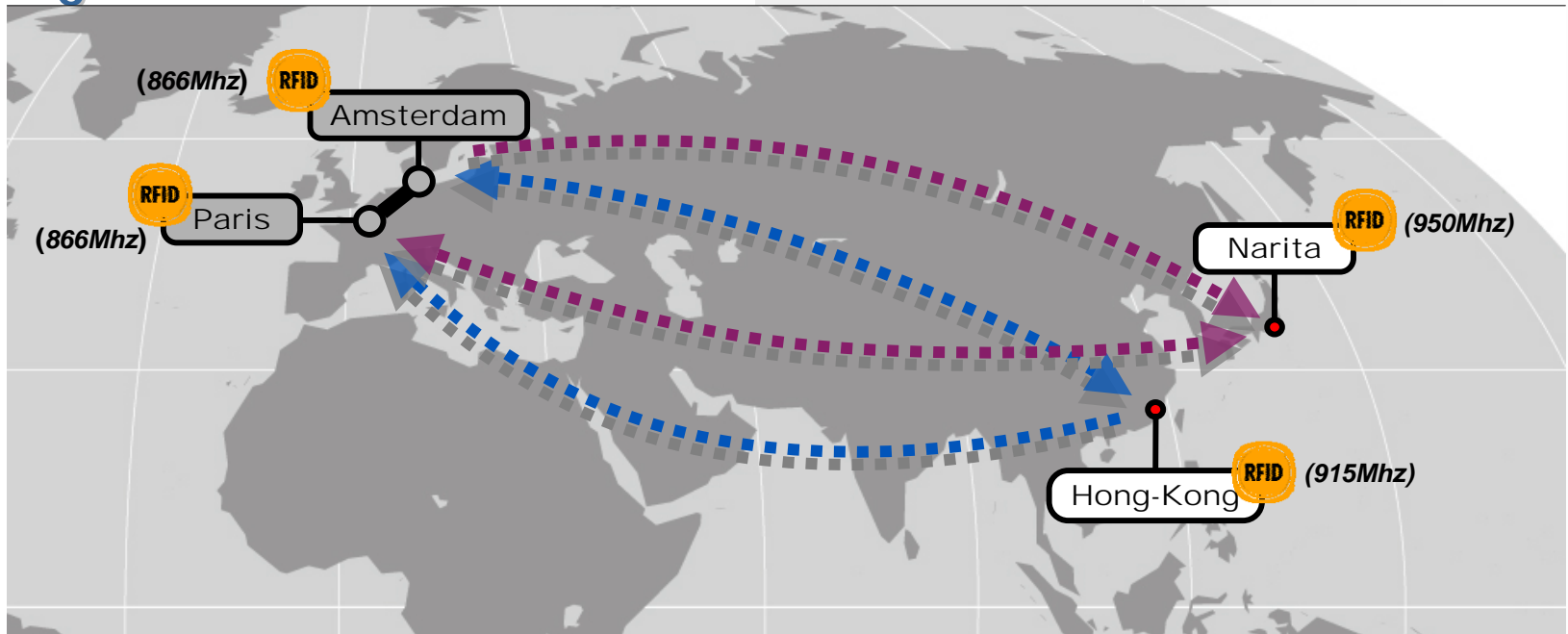
- Transfer sorters are critical infrastructures for Air France and Aéroport de Paris
- Specific RFID tunnels are designed to ensure that they do not disrupt operations or maintenance



Both performance and integration into the baggage sorting system are validated

2007: IATA RFID roll-outs

- Air France - KLM rolls out RFID check-in at Amsterdam
- As Hong-Kong switched to IATA RFID, Hong-Kong baggage begin to be identified in CDG



The technology is proven to be reliable enough to support roll-out business cases

- Identify the different use cases in target supply chain
- Define the required performance and maintenance levels
- Determine the importance of interoperability
- Conduct tests independently on a significant scale
- Think through the common frameworks and interface, which will be required to make use of the data
 - Logical level: data capture protocols, event management rules, security of data and exchanges
 - Application level: processes and associated services (ref. SOA), harmonization and administration of repositories

The technology works but market maturity requires controlling your technical pre-requisites

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- Which bag is yours ?

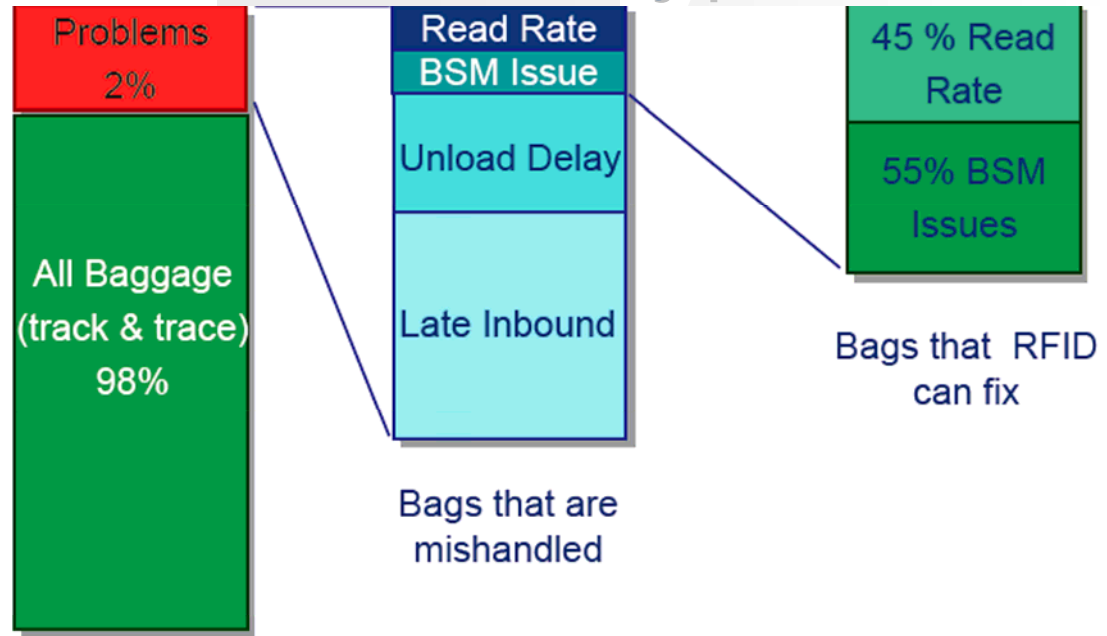


- In 2006, IATA evaluated the costs of mishandling baggage (first needs, labor, transport, compensation) and studied possible improvements by using RFID.

“Lost and mishandled bags are costing the industry \$2.5 billion a year”¹

¹ Source : IATA RFID Project Manager Andrew Price

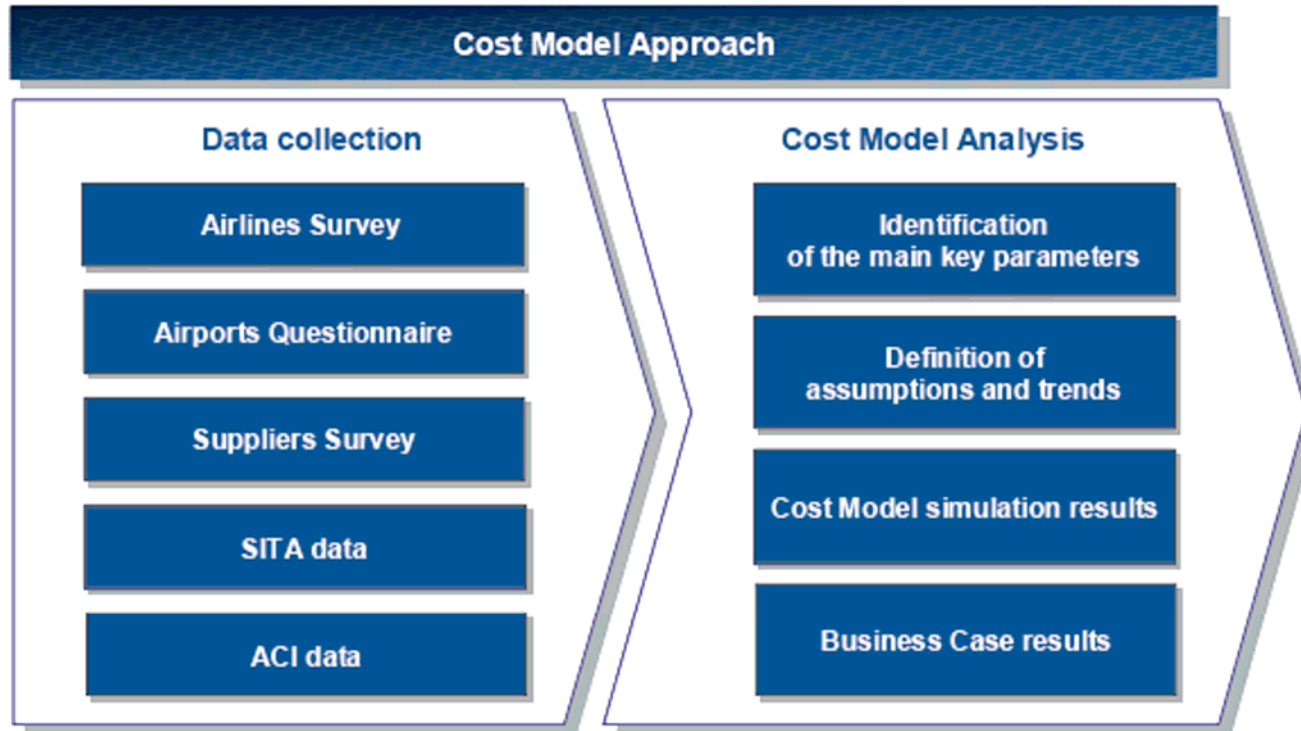
- Mishandling is complex and therefore only part of it can be solved by RFID



- But it does not mean that significant savings could be made

“Airlines collectively could save \$768 million annually if passive RFID tags were implemented for baggage handling, replacing barcode tags and scanners”

- Building ROI awareness at industry level in the public can and should be done (ref. StB Support Portal)



Such analysis is a way to kick-off open-loop tracking, if no Walmart / DoD mandate exists

- RFID is not just a “super barcode” with better read rate. It can bring real time scrutiny or new client services
- Changing procedures works well on main flows. 6-Sigma performance on minority flows can be hard-to-achieve and expensive. RFID can deliver that “long tail” value.
- Statistical analysis is key to understand where industry level findings apply
 - Probable causes of process failures
 - Stage in you supply chain : departure, transfer, arrival, picking...
 - Type of infrastructure : conveyors, laterals, doors...
 - “Hubbing level”¹ : variety in your flows (RFID versus other)

RFID is not a “silver bullet” but it can result into cost-effective innovations in the supply chain

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Merci pour votre attention

Thanks for your attention

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