



# RFID based Airport Management System

## WHITE PAPER

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Travel and transportation impacts a wide spectrum of industries. The airline industry handles more than 2 billion passengers annually. A major challenge to the industry, both in customer satisfaction and security, is tracking passenger baggage. Meeting security measures for baggage matching can delay departures significantly, impacting cost efficiencies and customer satisfaction. **Cost of mishandled or lost baggage, Passenger traffic monitoring is major issues in the air transport industry.** The balance of enhanced security standards and customer convenience is becoming increasingly more difficult to achieve in the wake of new threats that terrorism poses. With airports and airlines continuing to be vulnerable to threats, one of the areas where **the maximum time is consumed is check-in for passengers and baggage handling for airport / airline staff.** The travel industry is under constant pressure to improve customer service, safety and satisfaction while streamlining the process of passenger travel. A number of technologies have been implemented to speed these processes but one technology that has the potential to revolutionize baggage handling technique is Radio-frequency identification technology (RFID).

**RFID** is used to enhance the ability for baggage tracking, dispatching and conveyance so as to improve the **management efficiency** and the **users' satisfaction**. The RFID-enabled system provides baggage handlers and airport operators with real-time and historical **track-and-trace data, giving an instant overview of the position of bags in ULDs and dollies.** Developed in response to customer requests, the system provides a significant improvement in communication between the operators and baggage handlers, which will help to **reduce the number of short-shipped or misrouted items.** This, in turn, will improve **passenger security and satisfaction as well as reducing flight delays** caused by mishandled baggage.

## **Issues faced in Airports**

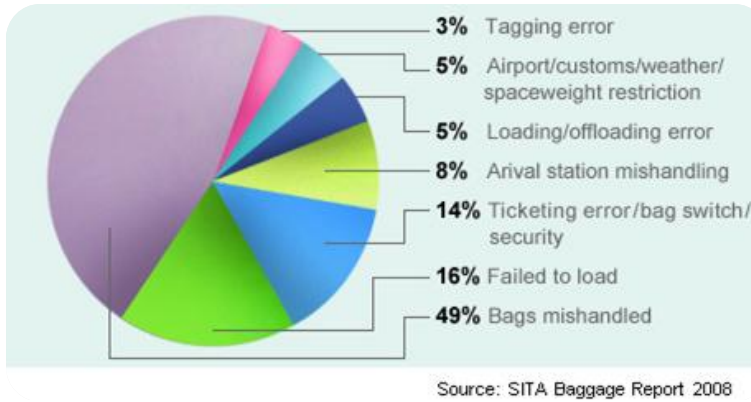
- Increased passenger and baggage traffic.
- Assure safety and security, with less cost and impact on customer.
- Manual examination of the baggage is tedious task and can introduce error.
- Increase labor cost & waste of time.
- Misplaced bags/ lost baggage.
- Identifying the right bag with right plane at any point in time is difficult.
- Unsatisfied customers i.e. Crowded Check in areas, long wait in lines encourages passengers to choose other airlines.
- Hard to monitor passenger traffic.
- Labor & transportation costs for redirecting the bag and delivering it to the owner or replacement costs to reimburse the owner for the lost luggage.
- Lost revenue.
- Flight delay caused due to mishandled baggage.

### Las Vegas Airport Bets on RFID

McCarran International Airport will be the world's first facility to use RFID to tag luggage airport-wide.

-- RFID Journal, Nov. 6, 2003

## Some of the reports obtained in Baggage Handling



**Figure 1: Main causes of baggage delays**



**Figure 2: No of Passenger Complaints**

### The domino effect of security actions

In August 2006, after officials reported uncovering a terrorist plan at London's Heathrow Airport, many thousands of passengers missed flights due to security line delays – the supporting reservations and baggage handling processes and systems simply could not accommodate the unexpected events on this scale. The resulting problems affected airports and passengers across the UK and at hundreds of airports in other countries as well.

–“Airlines terror plot’ disrupted.” *BBC News*. August 10, 2006. [http://news.bbc.co.uk/2/hi/uk\\_news/4778575.stm](http://news.bbc.co.uk/2/hi/uk_news/4778575.stm)

## RFID in Airport Management System

The Baggage Handling System plays a vital role at airport.

### Check-In:

When Passenger check in, the agent pulls up passenger itinerary on the computer and prints out one or more tags to attach to each of luggage as per the no of bags declared by the passenger. The tag is embedded with the flight information on it, including the destination and any stopover cities, no of bags. This number is unique to passenger luggage. All of the computers in the baggage-handling system use this number to look up passenger itinerary. Staff will apply tags containing RFID chips to bags as part of the normal check in process & Bag is placed on the belt where it is weighed automatically.

Airport Says Payback Is in the Bag

When its RFID luggage-handling system goes online in January, the Hong Kong Airport expects to lower labor costs, increase capacity and improve security.

-- RFID Journal, Dec. 13, 2004



Check In Process

### Baggage Handling:

After check in, bag is read by the Reader one by one which is placed around the conveyor & the data is sent to the server. Once the tag is read by the reader, the baggage-handling system tracks its movement. At any time, it knows exactly where the bag is on the conveyor system. RFID tag reader is connected with the mechanical arms that accurately divert baggage along different path. While passing through conveyor, an alarm is raised for any discrepancies. Airport staff personally checks the bag & after examination it is sent to the destination through the conveyor. Checking can be viewed by remote PC through the camera fitted at the observation place.



Baggage passing through Conveyor



Camera through which Baggage location is identified from remote

### Mantle to Market Air Passenger Tracking

The company plans to offer a Rolls-Royce-developed system using passive RFID tags on boarding passes to help manage the flow of passengers through the airport.

-- RFID Journal, Oct. 6, 2005

The conveyor system sorts all of the bags from all of the different airlines and sends them to DCVs (**destination-coded vehicle**) that are headed to the proper terminal. It's an electronic device which is a passive radio-frequency circuit that broadcasts a unique number identifying that particular car. While unloading the loaded bags, the DCV dumps the bag onto a section of conveyor that runs alongside the track.

### Loading the Plane:

At the sorting station, baggage handlers load the bags onto carts or into special containers that go right into the airplane. A monitor at the sorting station tells the handlers which bags are going where (i.e., the baggage-handling system always knows exactly where each bag is going).

### Baggage Claim:

Bags coming off a plane are loaded into carts and pulled by tug to the baggage-claim area. Since the bags are already sorted when they come off the plane, it is easy to keep the transferring bags separate from the terminating bags. When the bags get to the baggage-claim area, they are loaded onto a short conveyor that deposits them onto the carousel.



**Baggage loaded in DCV**

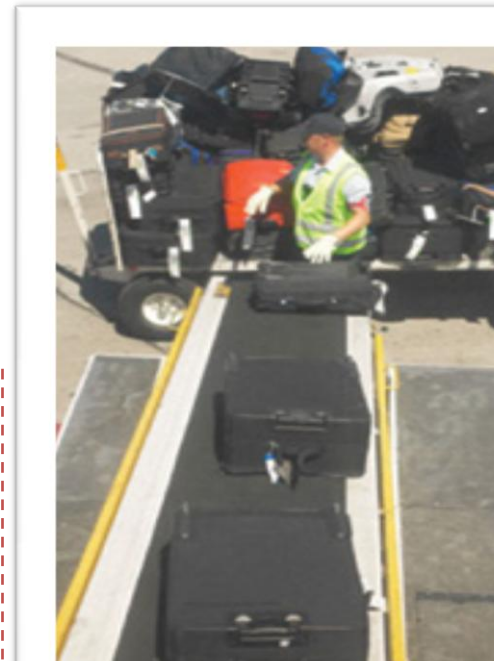


**Baggage Claim**

### RFID Lands at Frankfurt Airport

After placing passive tags on such things as fire shutters, emergency lights and even passenger lounges, Frankfurt has significantly improved the productivity and accuracy of its maintenance operations.

-- RFID Journal, Feb. 6, 2005

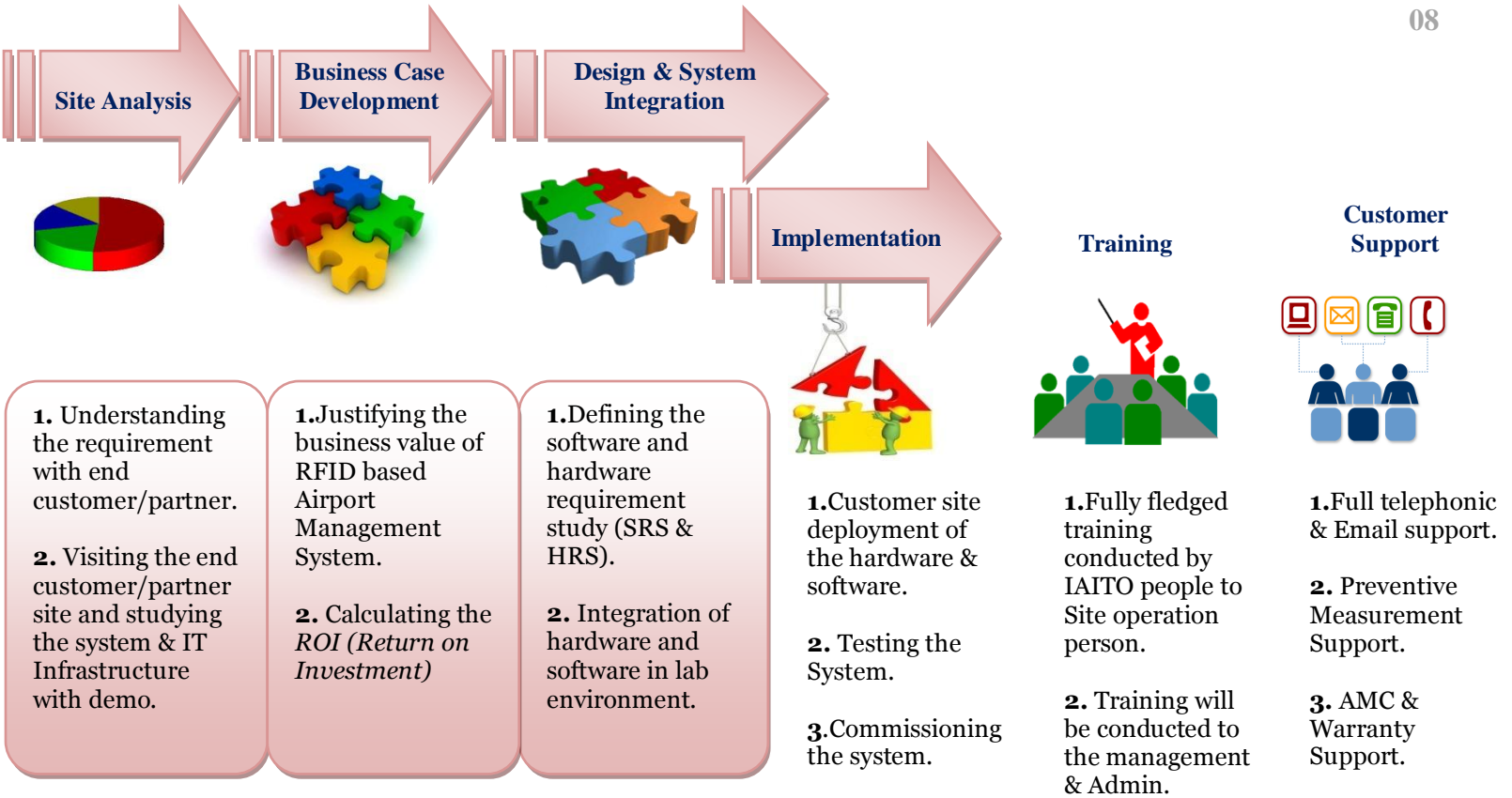


**Unloading from Plane**

## Benefits of RFID in Airport Management

- Quick location and removal of bags helps keep planes on schedule, which can save airlines thousands of dollars.
- Higher efficiencies for inbound and outbound cargo shipments.
- Increased visibility reduces the manual labor associated with locating cargo in holding areas, also improving accuracy.
- Less plane delays caused by lost baggage.
- Reduced wait times in lines helps to increase customer satisfaction.
- Reduce number of mishandled bags.
- Improve baggage process visibility to airlines and handlers.
- Increase security through an improved reconciliation process.
- Minimize need for manual encoding due to completely automated system.
- Better staff efficiency & productivity.
- Enhanced Customer Satisfaction.

## What IAITO can Provide



## Why you should select IAITO Infotech as your partner

- We understand the RFID Technology, Solution and have knowledge of the Industry with the top Notch IIT Kanpur R&D engineers who are having more than 5+ years experience in the same domain.
- Our understanding about the RFID Business Values & ROI Realization is with 15+ years experience business people in team.
- We provide High Quality Product & Testing process (*ISO 9001: 2008 Certified Company*).
- We Have High Techno Commercial viability – ROI.
- Indigenous Setup (Design, Developed & Tested in world class RFID lab of IIT Kanpur).
- We have Local Support & Strong Partner Network Framework to ensure better support.

## Conclusion

With intense pressure to function profitably and heighten security, the aviation industry must turn to new technology like RFID that can complement existing bar code technology to find the improved operational processes it needs to continue operations in a more competitive environment. RFID technology is already used thousands of times each day at airports around the world to identify employees, unlock doors and open parking gates. Implementation of RFID dramatically increases efficiency and lowers operational costs, avoids cost of lost baggage & delayed planes and points to a positive ROI.

About **IAITO INFOTECH PVT LTD (ISO 9001:2008 certified)** an incubate company of IIT Kanpur provides state of the art integrated traceability, identification and authentication solution. It provides software as well as integrated turnkey solution of both (hardware, software & services) in various technologies like RFID, NFC, GPS, Mobile technologies etc.

With the knowledge of experienced professional, we are able to help you to deploy right combination of technology that will maximize your ROI right from start and ensure its expandability as the application grow through the evolution of the technology.

With our R & D experienced team, we have developed different integrated solutions for various industries and carry one of the most comprehensive product/solutions.

IAITO's turnkey solutions model covers industries like Aviation, Manufacturing, Transportation, Retail, Government, Renewable Energy, BFSI and Mining.

For more Information kindly visit our website <http://www.iaito.co.in/>

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