Volume 5, Issue 3, July 2018 ISSN: 2348-8565 (Online)
International Journal of Modern Engineering and Research Technology
Website: http://www.ijmert.org Email: editor.ijmert@gmail.com

End to End Check-in Baggage Live Tracking System

Pragati Patharia
Assistant Professor,
Guru Ghasidas Vishwavidyalaya
Central University,
Bilaspur (C.G.) India
Email: pathariapragati@gmail.com

ABSTRACT

Baggage missing and misplaced are the major issues for the Airlines and passengers what they are facing today. Usually it occurs because of human error by mishandling of baggage starting from bag deposit counter till the aircraft when it moves through conveyor and baggage truck at the airport. Most of the airports are presently working on a conventional bar code system, where the bags tags are scanned manually with bar code scanner. But bar code system is time consuming & less efficient for controlling the manual error, such as the bag can be placed at the wrong baggage truck without any alarm or notification.

Considering with these conventional issues, the proposed interactive system is very robust, efficient, smart and secured for live tracking and notification. That will prevent misplacing of the baggage. With this system we can control the human error by using latest technologies. This will proactively alarm the operator, airline's concern team; notify the passenger and the flight crew members for every movement of the bag. This study is done based on the personal travel experiences and interviewing of passengers. And the system has been designed theoretically. The paper is open for all to use.

Keywords:— *Baggage missing, RFID application in Airport, Baggage tracking, intelligent baggage tracking system, advanced baggage tracking system, Automated baggage tracking system, mistake proofing in baggage handling system, baggage handling support system.*

I. INTRODUCTION

The existing baggage system is a conveyor system installed in Airport that transport checked luggage from ticket counter to areas where the bags can be loaded onto Aircrafts. The baggage handling system also transports checked baggage coming from aircraft to baggage claim or to an area where the bag can be loaded onto the Aircraft. The existing baggage handling system works on barcode system.

At the departure location airport passenger collects the barcode strip at the bag check-in counter and deposit it on the conveyor, then it will go to sorting location where it will be placed manually on baggage's trucks (trollies) for loading it into the aircraft. The baggage handling staff identifies the bags manually. And the bags are placed in the aircraft through a mobile conveyor.

At the connecting and destination airports, the bag will be taken out from the aircraft and place at the sorting location for the next flight or sent to baggage collection conveyor as applicable. As the bag travel happens manually, so many errors occur

while shifting the bag from one point to another point.

In this document the baggage tracking system is designed with using an additional RFID tag on the bag, and the RFID readers shall be installed at different locations of the bag route. It has been observed most of the time the bags get misplaced while transient or flight changed, each moment of the bag will be tracked. The process can be understand by below Figure 1.

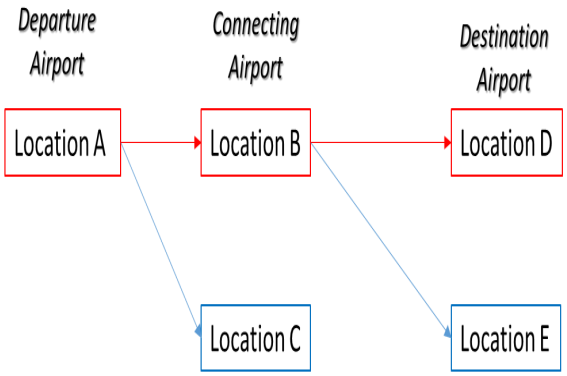

Figure 1: Travel route

The tracking system is divided in four sections:

- Baggage tracking system at departure airport (Location A)
- In flight baggage tracking system
- Baggage tracking system at connecting airport (Location B)
- Baggage tracking system destination airport (Location D/E)

Baggage tracking system at departure airport (Location A)

The passenger will scan his boarding passes to the Automated RFID printer, and will collect the RFID tag. The RFID tag will contain complete information of the passenger and travel route along with connecting flights detail. All the information will be stored in cloud server as well, that will be accessible by airline company, airport and custom department officials.

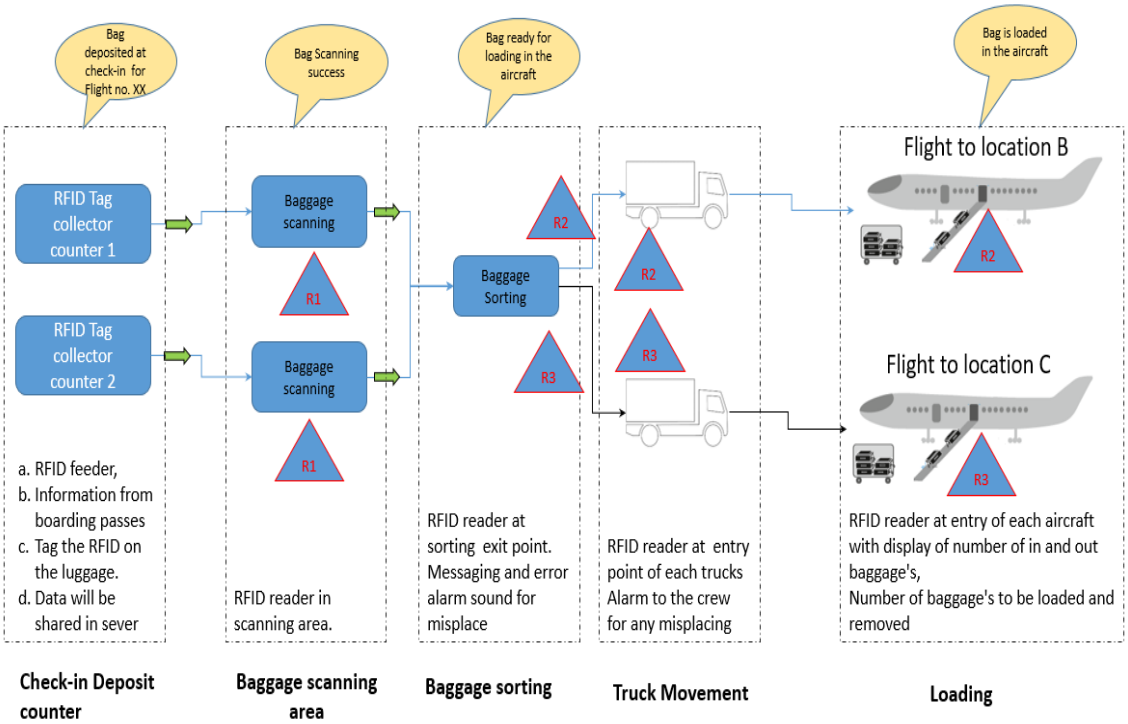

Figure 2: Tracking system at departure airport

An auto generated messages "YOUR LUGGAGE IS BOOKED FOR XXXXX, TRACKING ID XXXXXX" will be sent to the passenger's mobile via what's app and SMS.

Airline application software will send passenger's detail and respective RFID tag detail to RFID reader system (R1) located at baggage scanning area through wireless interface.

Airline application software will send the passenger detail and respective RFID tag detail (only location B) to RFID reader system (R2) located at baggage sorting area, luggage truck and airplane luggage gate through wireless interface.

Airline application software will send passenger detail and respective RFID tag detail (only location C) to RFID reader system (R3) located at baggage sorting area, luggage truck and airplane luggage gate through wireless interface.

Airline application software at departure airport will send passenger ticket details and respective RFID tag detail to Airline application software at connecting airport and departure airport through code sharing by using cloud server. Airline application software at connecting airport feeds the appropriate data of passenger and baggage details to its RFID readers. Similarly Airline application software at the departure airport feeds the appropriate data of passenger and baggage details to its RFID readers.

Baggage scanning area (2):

RFID Reader R1 located at baggage scanning area will allow the bags to sorting area. RFID Reader allows bags if the baggage details are matched to its stored data. Message notification as "BAG SCANNING DONE SUCCESSFULLY" will be sent to passenger. In case of bag is missing/untagged bag, it will notify to the airline application software.

Baggage Sorting (3):

RFID Reader R2 located at exit of the baggage Sorting area that will allow the bags that have to go to location B. Message notification as "**BAG READY FOR LOADING IN THE AIRCRAFT"** will be sent to passenger. In case of bag missing/ untagged bag, when the baggage detail is not matched to R2 stored data, then the Reader R2 will notify the airline application software. The baggage handling staff will be able to initiate immediate action to resolve the issue that will avoid further delay.

RFID Reader R2 installed at entry point of each truck will alarm to the staff for any misplaced baggage.

RFID Reader R2 installed at entry of aircraft with display will indicate number of loaded and unloaded bags.

Message notification as **"BAG IS LOADED IN THE AIRCRAFT"** will be sent to passenger.

Similarly, checking will be done by Reader R3 at truck and aircraft gate for Location C baggage and notification will be sent to the passenger.

In Flight baggage tracking system

Tracking from the infotainment screen or from a common screen:

While loading the luggage in the Aircraft the information will be shared from the RFID reader (which is installed at the aircraft gate) the common screen,

The passenger can enter his boarding pass detail and get the live location of the bag.

In case the bag is missing then the passenger can raise complaint in no time.

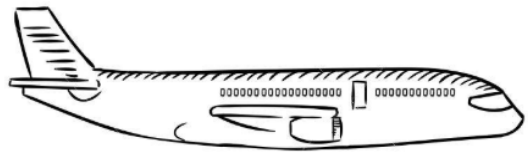

Figure 3: Inflight tracking system

Why inflight baggage tracking system is important?

- If passenger is unable to receive message on the mobile because of several reasons.
- Most of the time passengers think about the luggage when they are sitting in side the aircraft. Mostly messages get ignored at the airports.
- At present situation if the bag is misplaced then the passenger come to know at the final destination, then he has to complaint to the local staff, then only the staff will start locating the baggage, because of that the customer has to wait for a long time and sometimes the Airlines and insurance companies has to pay for bag delay penalties.
- As soon as passenger came to know about the missing bag he can raise the complaint that will directly go to the Airlines and ground staff and ground staff can take necessary action, they can ship the bag to the customer by immediate next flight, it will reduce costumer waiting time, hurdle irritation. And will increase customer trust.

Baggage tracking system at connecting airport (Location B)

When the aircraft is landed at the connecting airport at location B, RFID reader attached to aircraft gate allows the bags which are to be unloaded at Location B. Display at aircraft luggage gate shows the number of in and out bags to the staff. The display notifies the staff for any misplaced baggage.

RFID reader at the Truck will have the information about the baggage to be unloaded from the aircraft. It will notify the staff, in case of any baggage is left outside of the truck.

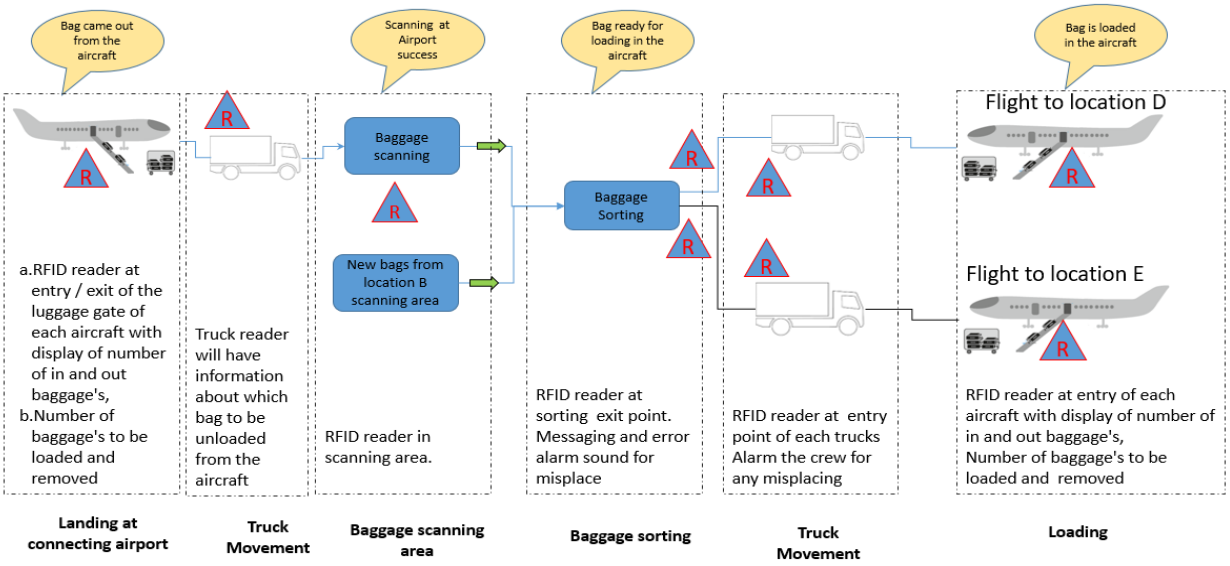

Figure 5 : Tracking at destination airport system

Similarly baggage tracking and notifying process occur at baggage scanning, baggage sorting, truck movement and baggage loading/ unloading to the aircraft at connecting

Airport as defined in section "Departure Airport Baggage Tracking System at Location A"

The Bags which are to be routed to location D are carried through truck to baggage scanning then baggage sorting and loading to the aircraft as shown in the figure 3.

New bags from location B are scanned and sorted, moved through truck to respective aircraft as shown in figure 4. Message notification will be sent to the passenger at various phases.

Baggage tracking system destination airport (Location D/E)

When the aircraft is landed at the arrival airport at location D/E, RFID reader attached to aircraft gate allows the bags which are to be unloaded at Location D/E. Display at aircraft luggage gate shows the number of loading and unloading and out bags to the crew. The display notifies the crew if any misplaced baggage.

The Bags which are to be routed to the next connecting location are carried through truck, baggage scanning, and baggage sorting and loading to the aircraft as shown in the below figure 5. Message notification is sent to the passenger at various phases as shown in the figure 6. The bags which are to be dropped to Arrival Airport are sorted and routed to the baggage conveyor for exit.

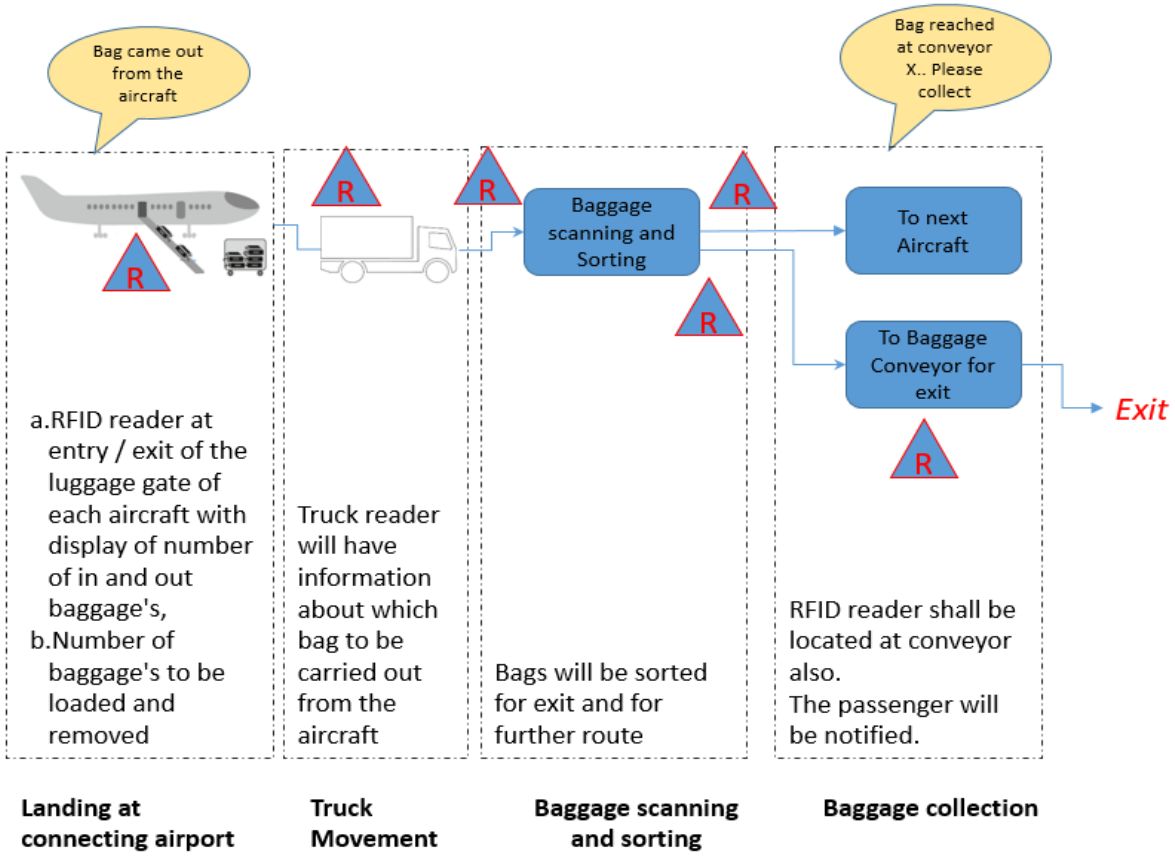

Figure 6: Tracking at destination airport system

Message notification as "**BAG REACHED AT CONVEYOR"X". PLEASE COLLECT"** will be sent to passenger.

CONCLUSION

This process defined solution for proper end to end tracking of the check-in baggage throughout the travel by using UHF passive RFID, cloud server and mobile application.

The live location of the bag will be tracked and notified to the passenger and the airline, additionally the data will be stored in the common cloud server which is connected with all airlines application.

The passenger will be updated automatically with multiple ways at the Airport and in the flight as well.

This solution provides customer's satisfaction that increases the Airlines performance rating in the market and decreases additional effort and decreased additional operating cost for locating the baggage and additional delivery cost for resolving the issues. That avoids the losses for the airlines. Ultimately the airline increases reputation and customer's satisfaction.

ABOUT AUTHOR

Mrs. Pragati Patharia received the B.E. degree in Electronic s & Telecommunications From Jabalpur Engineering College, Jabalpur, (India) and M. Tech Degrees in Opto Electronics from SGSITS, Indore, (India) in 2005 and 2009, respectively. She has been teaching various subjects like Digital Electronics, Basic Electronics, Microprocessor, Analog & Digital Communication, and Optical Fiber Communication in different Institutes from 2009. Her Research interest is an application of Solution Communication system in a data network.

REFERENCE:

[1] https://www.biztweet.aero/solutions-to-common-airport-challenges

[2] https://www.iata.org/whatwedo/ops-infra/baggage/Pages/index.asp

[3] http://www.airsafe.com/issues/baggage/baggage-claim.ht