

# SMART BAGGAGE MONITORING SYSTEM

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**Abstract :** A study of number of cases occurred regarding loss, theft or exchange of baggage while using various means of transportation. Analysis of a survey conducted for the purpose of gathering data on lost baggage cases provides a detailed information about frequency of these cases, which age group of population faces it more often and in which mode of transport these cases occur the most. To prevent these cases a new system must be introduced not only at the airports but also in daily transportation facilities.

An Anti-Theft baggage tracking system based on IoT including a small device which can be placed inside the baggage which will be connected to user's smartphone and will start beeping and alert the user through smartphone if the baggage is left outside a specific range. A low-cost system with high portability which can be implemented in major transport facilities as well as in daily life of people traveling in private or public transport.

**IndexTerms – Anti-Theft,smartphone,low-cost,survey,transportation.**

## I. INTRODUCTION

Transportation is a major part of people's lives and it is a link from one nation to another. Transportation is vital for a nation's economy, major transport facilities are airports and railways. Indra Gandhi international Airport in Dehli is one the busiest airport in India, this airport handled around 65.69 million passengers in FY 2017-2018. The Domestic aviation market is dominated by Indigo airlines, Indigo carried some 43.5 million passengers and generated a revenue of 2.9 billion\$. Number of cases regarding mishandling of baggage occurred among these huge number of passengers has to be compensated by the airlines. As the airports are equipped with latest luggage monitoring system cases of mishandling of luggage has been minimized to a great extent, even if the luggage is left at the airport passenger can claim his luggage even after leaving the airport because of the luggage code pasted on it which contains the details of the luggage and to which passenger it belongs.

As public transport like trains and buses are the most popular means of transport in India, cases occurred regarding loss and theft of baggage are too high but not on the record as the buses or railways are not equipped with latest baggage monitoring system and implementation of this system on large scale for public transport will be too much expensive. People traveling on daily basis using private or public transport face the case of misplacing or theft of their baggage/belongings.

## II. Literature Review

The rate of abused mistreatment was reduced by 21% to approximately seven per 1,000 passengers. Good news about the loss of baggage is that airlines around the world finally recover 97% of the battered of all battered, 81% were delayed, 16% were damaged or stolen and 3% were declared lost or stolen and never met.

As the modern baggage handling system has reduced the number of cases related to the loss or change of luggage at the airport, the same systems can not be implemented for public transport in daily use. As public transport (Roads) is the main means of transport in India, the number of people traveling on public transport daily, such as buses, is much greater than that of airports. The cases of theft or loss of luggage are much greater and most of these cases are not registered in the case of public transport.

Technologies such as radio frequency identification (RFID) are currently in use and in development for future applications. In the application of air baggage management, RFID tags are used to improve the ability to track, send and transport luggage to improve the efficiency of management and satisfaction of users. **Dataset**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Timestamp	Age	Profession	Long_dist	local_trav	Means_of_long_dist_trav	Means_of	Issue_of	Issue_in	Issue_details	Issue_resolution	Smart_sys	daily_usag	Your_Suggestions							
2	2019/01/3	19-35	Student	once in a	Daily	Railways	Public tran	Yes	Roadways	Loss of Ba	No										
3	2019/02/0	19-35	Student	twice in a	Daily	Roadways	Private Vel	Yes	Roadways	Loss of Ba	No										
4	2019/02/0	19-35	Salaried	once in a r	On week	Railways	Buses	Yes	Railways	Loss of Ba	No	Yes	Yes								
5	2019/02/1	19-35	Student	once in a r	Daily	Roadways	Buses	Yes	Roadways	Loss of Ba	Yes	Yes	Yes								
6	2019/02/1	19-35	Student	once in a r	Daily	Roadways	Buses	No				Yes	Yes	Smart devices are available just we don't know them.							
7	2019/02/1	19-35	Student	once in a y	Sometime	Railways	Cab Servic	No				Yes	Yes	Many							
8	2019/02/1	19-35	Student	once in a y	Daily	Railways	Private Vel	No				Yes	Yes								
9	2019/02/1	19-35	Student	once in a y	Daily	Railways	Buses	No	Railways			Yes	Yes								
10	2019/02/1	19-35	Student	once in a r	Daily	Roadways	Buses	Yes	Roadways	Yes	Yes	Yes	Yes								
11	2019/02/1	19-35	Student	once in a r	Daily	Roadways	Buses	Yes	Roadways	Yes	Yes	Yes	Yes								
12	2019/02/1	19-35	Student	once in a r	Daily	Roadways	Buses	Yes	Roadways	Yes	Yes	Yes	Yes								
13	2019/02/1	19-35	Student	once in a y	2-3 month	Railways	walking	Yes	Railways	Theft	No	Yes	Yes								
14	2019/02/1	19-35	Student	twice in a	Daily	Railways	Private Vel	Yes	Roadways	Theft	Yes	Yes	Yes								
15	2019/02/1	19-35	Student	once in a r	On week	Roadways	Buses	Yes	Roadways	Exchange	Yes	Yes	Yes								
16	2019/02/1	19-35	Student	5 times a	Daily	Railways	Trains	No				Yes	Yes								
17	2019/02/1	19-35	Student	once in a y	Daily	Railways	Trains	No	Railways	Loss of Ba	No	Yes	Yes	I am not facing the above problem but I saw so many people facing this problem bet							
18	2019/02/1	19-35	Student	once in a r	On week	Roadways	Public tran	No			No	Yes	Yes								
19	2019/02/1	19-35	Student	once in a y	On week	Roadways	Private Vel	Yes	Airways	Exchange	Yes	Yes	Yes								
20	2019/02/1	19-35	Student	twice in a	Daily	Railways	Trains	Yes	Railways	Theft	No	Yes	Yes								
21	2019/02/1	19-35	Student	twice in a	Daily	Railways	Public tran	Yes	Roadways	Loss of Ba	No	Yes	Yes								
22	2019/02/1	19-35	Student	once in a y	Daily	Railways	Private Vel	No	Roadways	Theft	No	Yes	Yes								
23	2019/02/1	19-35	Student	once in a y	Daily	Railways	Trains	No	Railways	Exchange	No	No	Yes								
24	2019/02/1	19-35	Student	once in a r	Daily	Railways	Trains	No				Yes	Yes								
25	2019/02/1	19-35	Student	once in a y	Daily	Railways	Trains	Yes	Railways	Loss of Ba	Yes	Yes	Yes								
26	2019/02/1	19-35	Student	once in a y	Daily	Railways	Public tran	Yes	Railways	Exchange	No	Yes	Yes								
27	2019/02/1	19-35	Student	once in a y	Daily	Railways	Trains	Yes	Railways	Loss of Ba	No	Yes	Yes								
28	2019/02/1	19-35	Student	once in a r	On week	Railways	Buses	Yes	Roadways	Loss of Ba	No	Yes	Yes	Always support for good things							
29	2019/02/1	19-35	Student	twice in a	Daily	Railways	Private Vel	No	Railways	Loss of Ba	No	Yes	Yes								

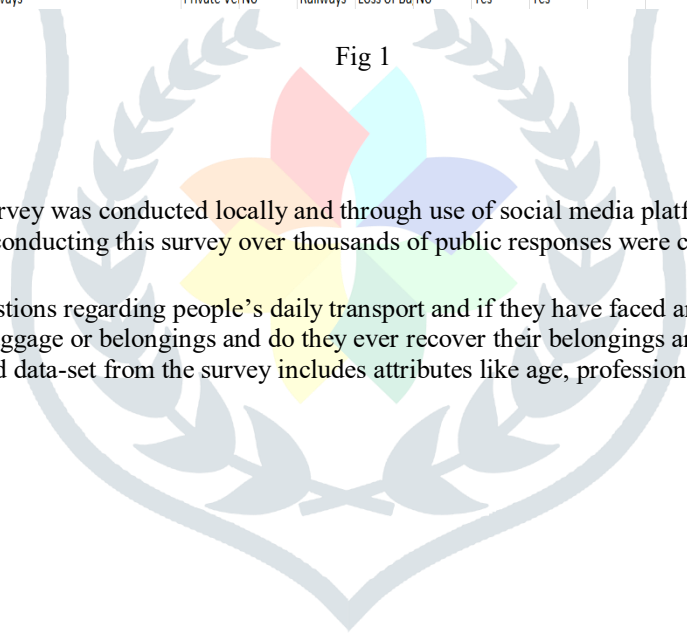
Fig 1

a) Data collection:

For preparation of data-set a survey was conducted locally and through use of social media platforms. This survey was conducted for a duration of 2 months, by conducting this survey over thousands of public responses were collected.

b) Description:

Survey included 12 simple questions regarding people's daily transport and if they have faced any issue regarding loss/Theft/Exchange of their baggage or belongings and do they ever recover their belongings and if they do, how long the recovery process took. Prepared data-set from the survey includes attributes like age, profession, means of transport and their frequency of transportation.



IV. Observations

Public responses gathered from the survey included people from different age groups.

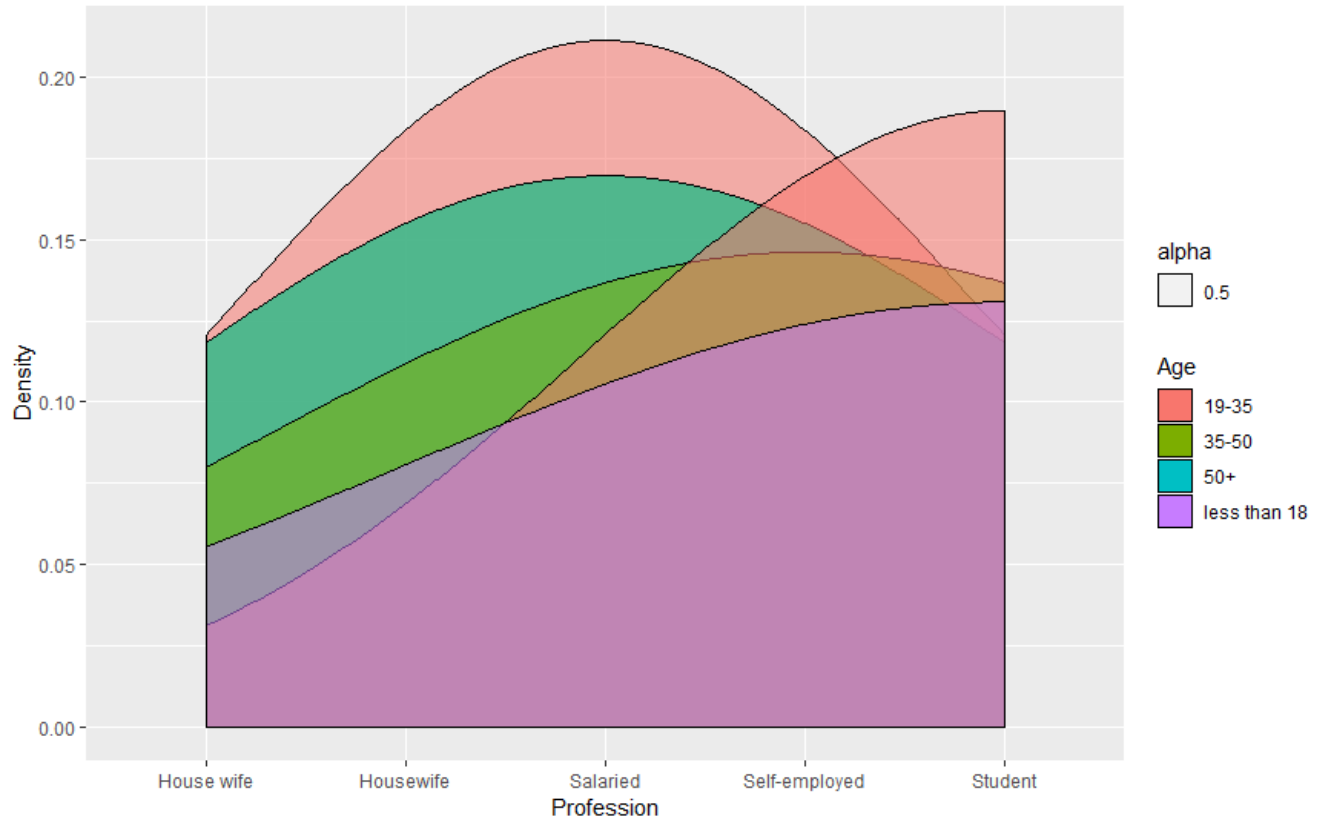


Fig 2

The kernel density plot shows the density of age group of people who responded to this survey.

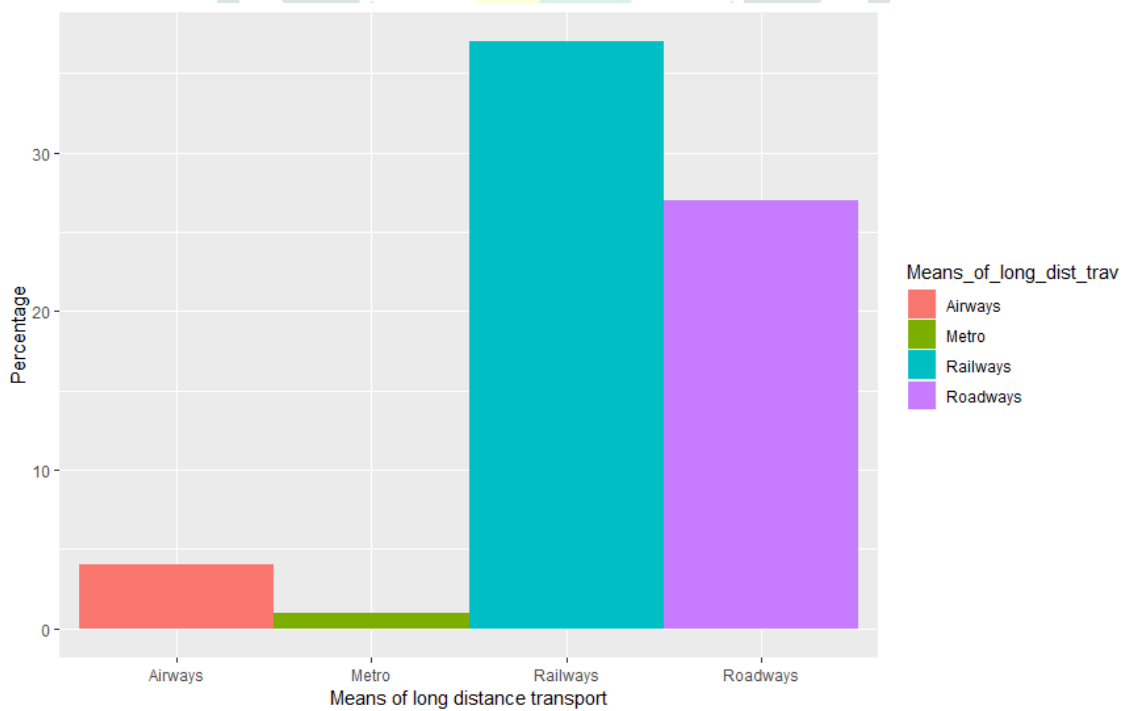


Fig 3

Above bar plot displays the most popular means of transportation used by people for long distance journey.

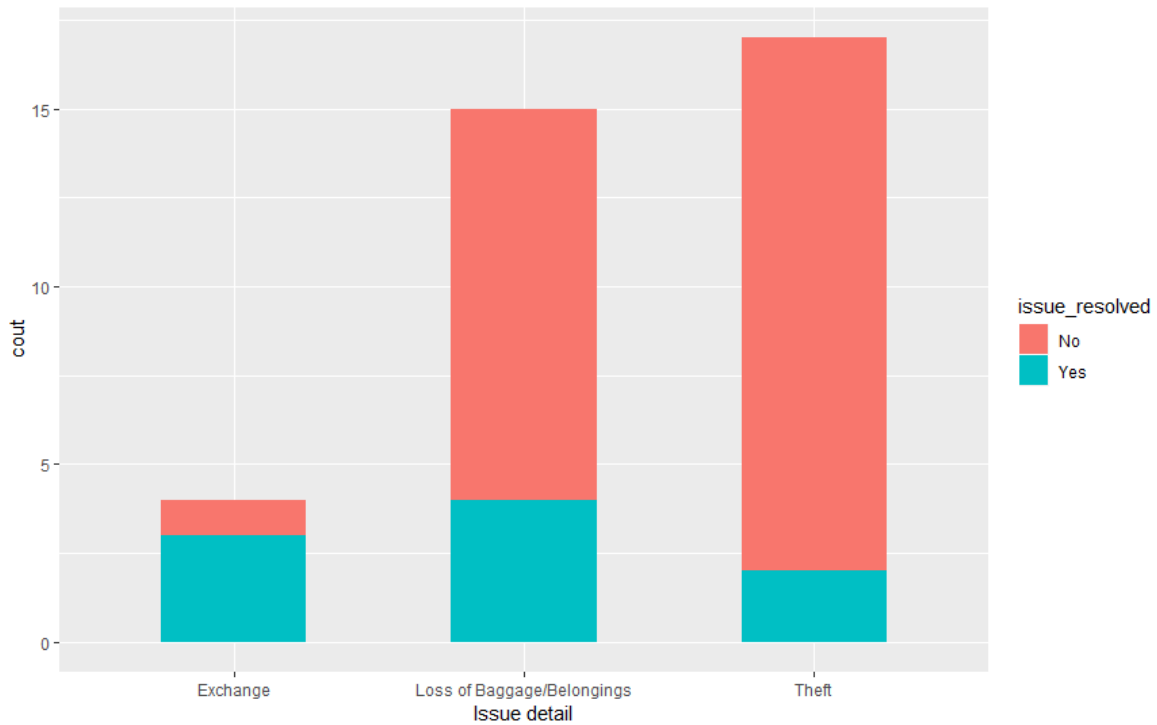


Fig 4

Above stacked bar plot displays whether the issues faced by people during their journey was resolved or not, and details of the issue faced.

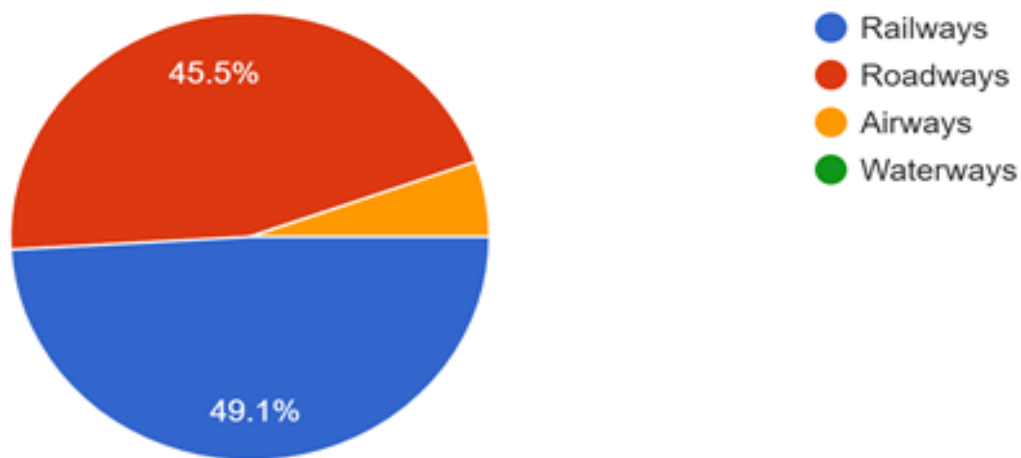


Fig 5

Above pie chart displays the percentage of means of transport used while issue of baggage was faced by people.

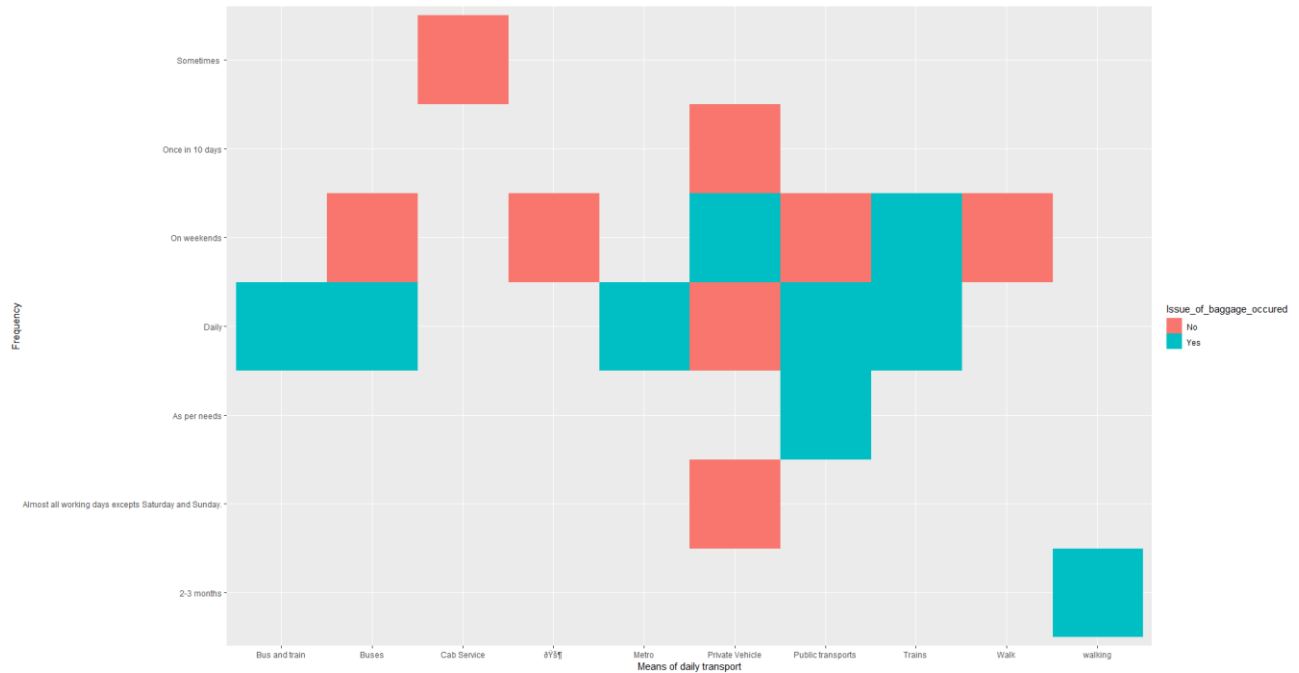


Fig 6

Above Waffle plot displays the relation between frequency of people travelling locally and the means of their transport and whether they faced an issue regarding their baggages.

## V. Proposed System:

For tackling the issue of baggage loss in our daily lives this paper proposes a simple yet effective device which is compact and can be much cheaper as compared to latest baggage tracking system used on large scale at airports. Due to the compact architecture it is highly portable and well suited for daily transportation.

### a) System Architecture:

Proposed system is a IoT based device which will be connected to the user's smartphone through blue-tooth or Wi-Fi all the time and will be having a unique baggage id assigned through a baggage handling application installed on the user's phone. The hardware will be consisting of Nano Arduino circuit, a GSM/GPRS module and a wi-fi or blue-tooth module, these components will be put into a small case will easily be attached inside the baggage. The device will be powered by a small 5v battery

### b) System functionality:

Device will be working on the blue-tooth/Wi-Fi. Installed GSM/GGPRS module will have an e-sim id. As soon as the baggage is left outside a specific physical range from the user the in-bag module will be disconnected from the user's phone, this will trigger the GSM/GPRS module to send a message to the user's phone, the triggered warning will be sent to the person's contact number which is previously registered on the module by the user. The message will contain the duration about how long the bag is left unattended, the unique baggage id.

**VI. References:**

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