

RFID BASED ASTUTE BACKPACK

**Deepali Patil, Swarada Barve, Priyanka Palve,
Kavita Hatkar, Onkar Sargar**

*1(Department of Information Technology, Ramrao Adik Institute of Technology
Nerul, Navi Mumbai)*

*2(Department of Information Technology, Ramrao Adik Institute of Technology
Nerul, Navi Mumbai)*

*3(Department of Information Technology, Ramrao Adik Institute of Technology
Nerul, Navi Mumbai)*

*4(Department of Information Technology, Ramrao Adik Institute of Technology
Nerul, Navi Mumbai)*

*5(Department of Information Technology, Ramrao Adik Institute of Technology
Nerul, Navi Mumbai)*

ABSTRACT

when we plan to travel somewhere, we make a list manually or on a phone, according to it we pack our essentials. But sometimes packing a bag without missing anything can be a challenging task as there are always chances of misplacing the list. There are some devices which are basically a card with GPS tracker enabled and you have to attach it to your belongings to track it. But it is not a viable solution to put those cards in all of your belongings as it will be very costly. Also, there are some systems which uses barcodes that needs manually scanning of the codes on the items. This makes the whole system human operator dependent, hence more likely susceptible to errors. Thus, to make an entire system automated in this paper we proposed a system which provides a generic platform to enhance the user experience by applying RFID tags on each object and making a list of objects on the application that need to be taken depending on the current weather, if we forget any object then the application would notify us. The proposed system can be used for Trip planning and Daily routine objects.

Keywords - RFID technology, GPS tracker, tags, barcodes, Backpack, List.

I. INTRODUCTION

As a world is moving towards digitalization and automation, this current generation needs a bag which will be able to reduce hectic process of packing, therefore there is need of an application which will make tedious packing process more convenient and this is possible using RFID Technology. Basically, RFID is nothing but of frequency waves which are used to read and collect the information which is available on RFID tags. These tags are connected to an object. A reader scans the items from several feet away [1]

Existing Solution uses barcodes which needs manually scanning of the codes on the product. This makes the whole system human operator dependent, hence prone to unavoidable error. It is also difficult to count the items by manually scanning the respective bar codes. These errors can be eliminated by automating the whole system. Hence to make the whole system automated, we make use of the RFID technology to monitor or track items.

The following paper discusses the use of RFID to track personal belongings that a person will carry. Products can consist of water bottle, electronic devices, important documents, medicines and many more. These products will carry

RFID tag and will communicate with RFID reader. Whenever one of these products gets out of range of reader, the registered user will be alerted with the help of an Application.

II. RELATED WORK

In [2], the author, Sudha Senthil Kumar *et.al.* Demonstrated an application named konas luggage to track lost luggage and backpacks with the help of a smartphone. In their work, the tracking device present in the bag and it can track the device through the application which is installed on the smart phone. But the system can only track the bags if they have been lost and not when they are stolen, so this doesn't provide the feature of providing the surety that whether the bag would ever be recovered or not. As application does not give immediate response, it is possible that the stolen baggage has been moved to a different place by some nefarious agents.

In [3], the author, BALAKRISHNA¹, A. RAGHURAM *et.al.* have mentioned track able tags which are available and can be tied with the bag in order to track the bags when they are lost. These tags have inbuilt GPS chip through which the company would track the lost bag. There are a lot of companies in the market who are providing these tags with different features like dyno tag, LugLoc and Robot Check. Limitation of this paper is, system will notify owner only if the bags are lost, if they are stolen then there is no solution been provided. The tags which are used doesn't provide mobile or computer frontend interface to track and view the location of the bag, instead the company owning the tag would try to track down the location, so the owner is always in dark about what is exactly happening.

In [4] by Alireza Kavianpour *et.al.* Proposed a luggage tracker device which is placed inside the bag for tracking each product. It works on ground-based cellular technology and microelectronics. When in an airplane during takeoff, it shuts down automatically and enters in an airplane mode and again activates during landing when the pilot applies brakes. The limitation of system is it doesn't provide instant notification if the bag is theft or lost. And it is very costly as well as it is not available easily in every country.

In [5] the author Alisha M Baji *et.al.* proposed a web application that predicts the intended destination of user using location history and machine learning algorithms and providing route for the same. This system uses user's location history; it predicts user destination gives current location, date and time. Also, it Makes use of auth 2.0

In [6] the author P.G. Gayathri K. Abhiram proposed system based on Atmel microcontroller is found to be more compact, user friendly and less complex, which can readily be used in order to perform several tedious and repetitive tasks. Simulation is used which helps to understand hardware configuration and avoid time wasted on setup issue. In this AMTEL microcontroller is used and it can process only one Program at a time

III. PROPOSED WORK

1. APRIORI ALGORITHM

The Apriori algorithm requires scanning the product with RFID reader and the RFID tags every time it generates the candidate item-sets in order to build the association rules. This issue affects the performance of the Apriori algorithm and causes scalability problems, especially when the transactions in the database are large in number. In Astute Backpack Using RFID acknowledgement applications of recommendation systems, the size of the (User \times Item) matrix is in a bag, and in most commercial recommendation systems this matrix suffers from the sparsest problem which means there is a substantial number of items in the systems have not yet been rated. Thus, applying the Apriori algorithm to a sparse matrix can lead to irrelevant information and can cause poor recommendations to the target user.

Our proposed hybrid framework is to apply the Apriori algorithm on two dimensional spaces (User × Item) with a large number of users and a small number of items

Our approach is divided into the following steps:

The first step is to apply the Apriori algorithm to a (User × Item) matrix (RFID Reader with Tags) to generate the association rules for the product reminders.

The second step is to divide the items that have been sorted by users into two categories: Android based RFID tagged system or normal product.

The third step is to use the generated association rules to discover the frequent item-sets of RFID Based Items set and find the correlations among those items to recommend new items to a target user.

The last step is to apply the RFID based approach into Product Items set to recommend some new items to a target day.[7]

The proposed system comprises of RFID Technology to track personal assets of user. Items could be anything like Water bottle, important documents, watches, wallet and many more. RFID tag will be appended on the items which need to convey. With the help of an application user will provide some location based on that a suggestion list will get generated user will be able to add those items in their own list. Whenever user will move from its home location to other location then system will generate an alert of missing items in your bag with the help of Geo-Fencing will know that we have left one zone and have entered in other.

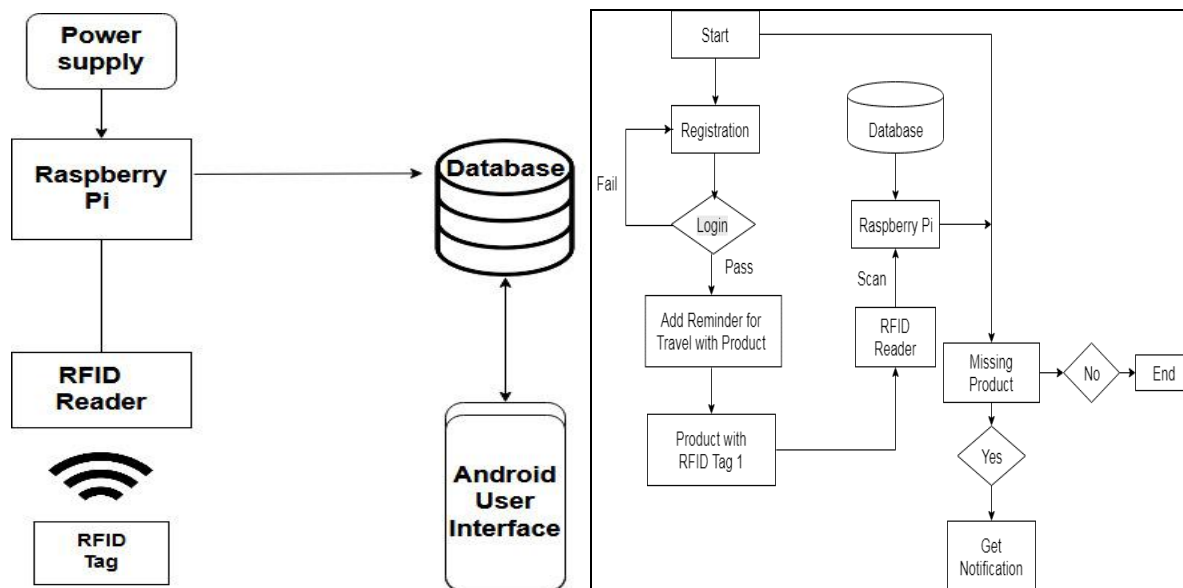


Fig.1: System Architecture. Fig.2: Flowchart Diagram

The proposed system will have the following modules:

Passive RFID tags are chosen for this system. Each of the system users will have their own RFID tag, which will interact with the RFID reader through the Raspberry PI. The RFID reader provides the power for RFID tags and receives the feedback from the RFID tags through the antenna. The reader will then pass the information to the

Raspberry pi for further processing. Here Raspberry pi is used a controller where all the components are connected to it. RFID Reader along with the tags attached to it.

Module I-Hardware

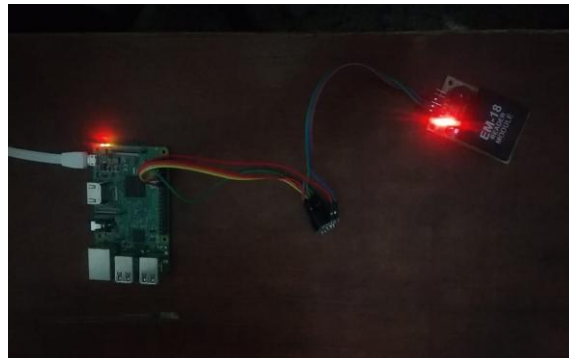


Figure 3 : Hardware Connectivity

RFID module and Raspberry pi are attached and RFID pins are soldered. By providing power supply LED on Raspberry pi and Reader Module glows indicating proper working of the system. When any of the RFID tags are close to Reader, they are detected and their unique identification number is displayed on screen. These unique Ids will get stored in a database.[9][10]

Module II-Application

To use an application first user should register and then login. After registration, User will get an Email where it will contain password generated using a random generator. After successful Login user will redirected to screen as shown in fig 4 where user can enter any location they want to visit.

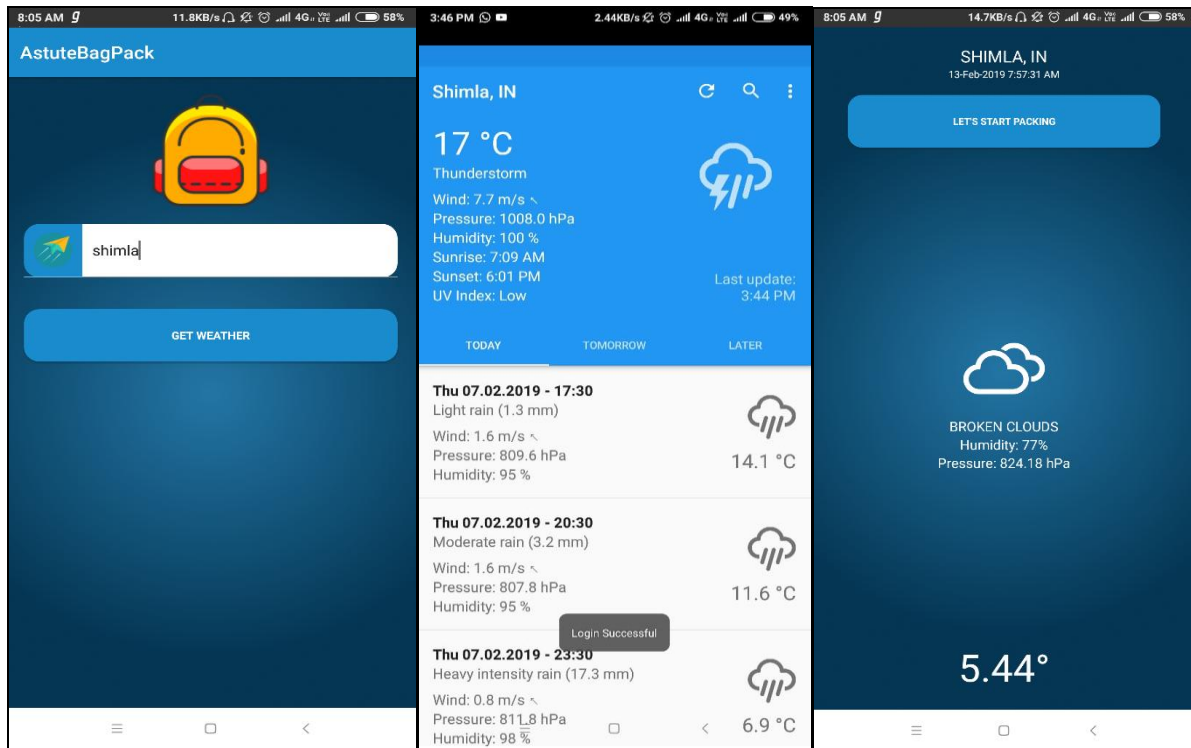


Figure 4.: Select place Figure 5 : Weather Details Figure 6 : Weather Details

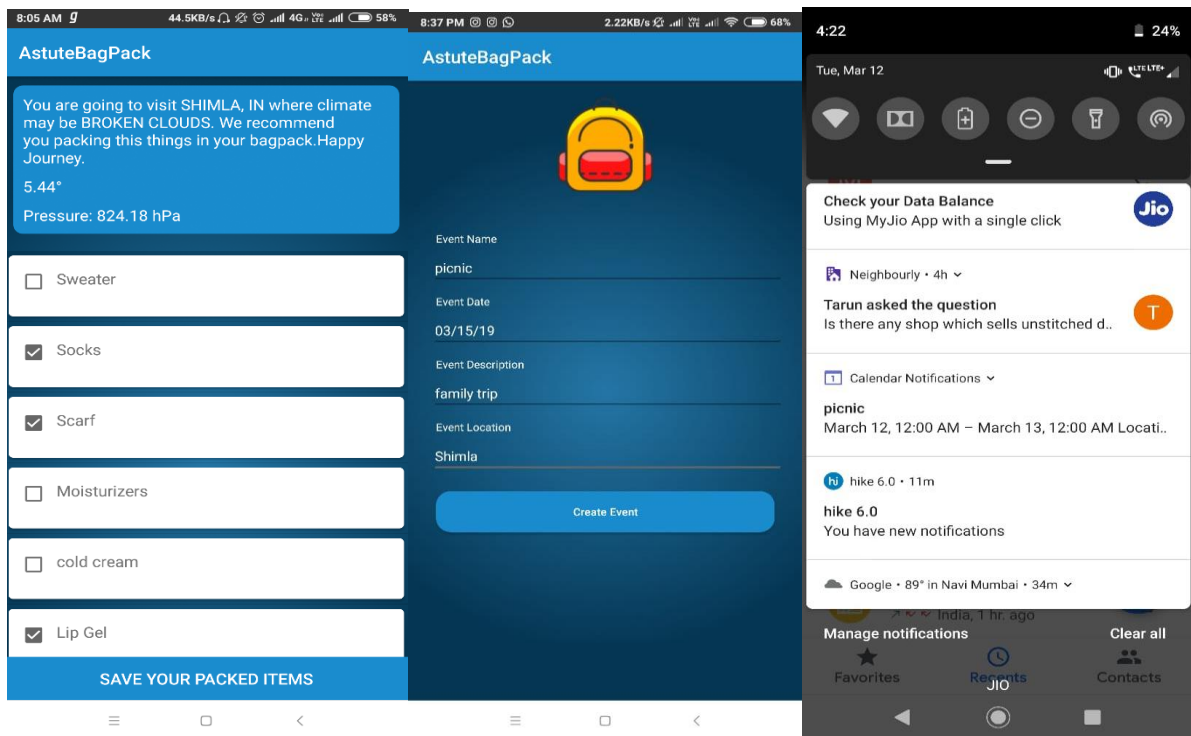


Figure 7: List generation Figure 8 :Event Creation

Figure 9 : Reminder Generation

V. CONCLUSION

Astute Backpack is an application which is entirely used for travelling purpose. By using this proposed application, a user will get a dynamic list according to temperature for packing. This will reduce the whole exhausting process of packing. The aim of the application is to allow a person to plan their travel even earlier than they begin.

REFERENCES

- [1] Dan Yu, "Tracking Algorithm in RFID Reader Network," 18-Mar-2006.[Online]. Available: <https://ieeexplore.ieee.org/xpl/browsePopular.jsp>. [Accessed: 13-Mar-2019].
- [2] <https://www.indiegogo.com/projects/konas-the-world-s-only-luggage-you-can-track-with-your-smartphone>
- [3] BALAKRISHNAI A.RAGHURAM, "RFID Based Airport Luggage Checking and Tracking System using GSM Technology," Oct-2014. [Online]. Available: <http://ijsetr.com/uploads/435216IJSETR2743-035.pdf>. [Accessed: 13-Apr-2019].
- [4] *Trakdot Luggage Tracker*. [Online]. Available: <https://www.trakdot.com/en/press>. [Accessed: 11-Mar-2019].
- [5] P.G.Gayathri K.Abhirami.M.E T.Sivaranjani, "Pervasive Interaction Smart Bag Using RFID Technology," 09-Mar-2014. [Online]. Available: http://www.ijeit.com/Vol 3/Issue 9/IJEIT1412201403_22.pdf. [Accessed: 13-Mar-2019].
- [6] C. Jechlitschek, "A Survey Paper on Radio Frequency IDentification (RFID) Trends," A Summary of Network Traffic Monitoring and Analysis Techniques. [Online]. Available: <https://www.cse.wustl.edu/~jain/cse574-06/ftp/rfid/index.html>. [Accessed: 2018].
- [7] Thakre, K. R., & Shende, R. (2017). Implementation on an approach for Mining of Datasets using APRIORI Hybrid Algorithm. doi:10.1109/ICOEI.2017.8300845
- [8] <https://vs.inf.ethz.ch/publ/papers/smc02rfid.pdf>
- [9] https://en.wikipedia.org/wiki/Raspberry_Pi
- [10] <https://www.techopedia.com/definition/26992/radio-frequency-identification-reader-rfid-reader>
- [11] https://support.google.com/websearch/answer/7220196?p=AMPvisit_id=636767343545460477-930099170&rd=1
- [12] https://www.cs.virginia.edu/~robins/papers/Multi_Tags_Journal.pdf
- [13] <http://www.jetir.org/papers/JETIR1602017.pdf>