

Implementation of Data Analysis & Broadcasting Using Ibeacon Technology

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Abstract: Data mining technique provides the meaningful information. This information is useful in market-basket analysis. By applying Apriori algorithm on transactional database with minimal support & minimal confidence frequent item set are generated. Offers, sales generated using analysis on frequent item sets & these results are broadcasted to the customer on mobile with the help of iBeacon device. It provides an easy way to promote the products.

Promising sensing application is the iBeacon indoor Proximity technology proposed by Apple, where a BLE enabled mobile device can determine its position in an area by knowing how close it is to strategically placed simple wireless transmitters, named iBeacon[3]

1. LITERATURE REVIEW

The Apriori algorithm was proposed by Agarwal and Srikant in 1994. Apriori is designed to operate on databases containing transactions (for example, collections of items bought by customers, or details of a website frequentation).

The improved Apriori algorithm can solve the problem of traditional Apriori algorithm. After analyzing the Apriori algorithm, this algorithm is incapable due to it scans the database several times. Based on the planning of getting to database once, a new recovered algorithm formed on the Apriori is put forward in this paper. Experiments show that it can mostly add computation competency.[1]

This algorithm is used for calculating support and confidence. iBeacon is a technology standard developed by Apple, that was introduced in 2013 at the World Wide Developer Conference (WWDC).

This technology is used to create a small & secured network. iBeacon broadcast information which is then received by the App of customers. This type of service is not yet implemented in any store like iNSPIRE, Big-bazaar, etc.

2. INTRODUCTION

Data mining is the core process of knowledge discovery in database. Apriori algorithm is improved by reducing the number of scanning database. The algorithm reduces the storage room, improves the competency of performance and correctness of the algorithm.

It helps to generate sales & offers which will be broadcasted using iBeacon technology. iBeacon is a newly emerging bluetooth low energy device (BLE) technology useful for indoor tracking.

iBeacon has its network range like immediate, near, far, unknown.

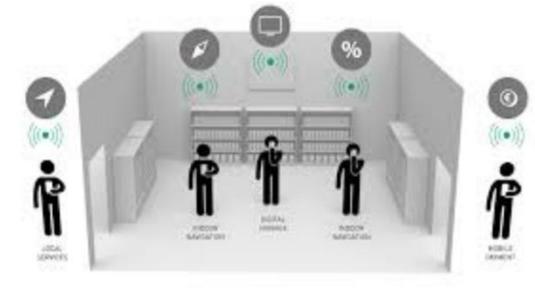
3. PROPOSED SYSTEM

The proposed application has following objectives:

- Today we are living in a world where everyone is so attached to the mobile, people want to do every thing on the mobile. Nowadays shopping is also done on mobile phones. So we want to make the real shopping experience more interesting and interactive.

- Suppose we are moving by a shop and we want to shop something so we need to reach that shop and ask for product, but if in case you get some notification from the shop that today we are 50% off then you can reach that shop and shop that product.
- That's what we want to create an interesting shopping experience.

Fig (1.0) represents the work flow of our application and the hardware



The requirements for the project are:

HARDWARE AND SOFTWARE

For Desktop Application

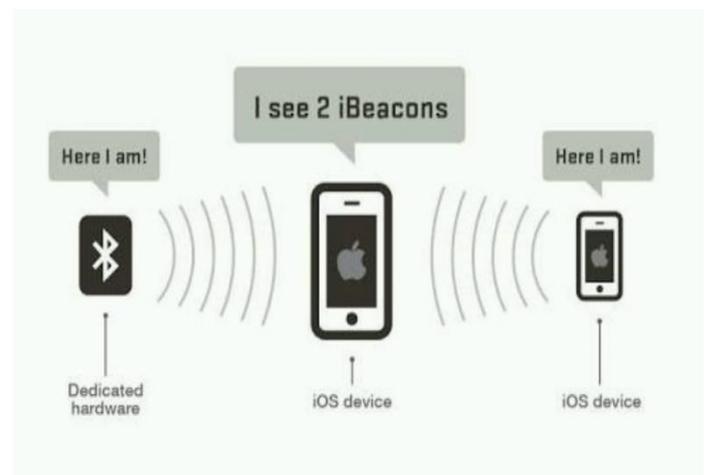
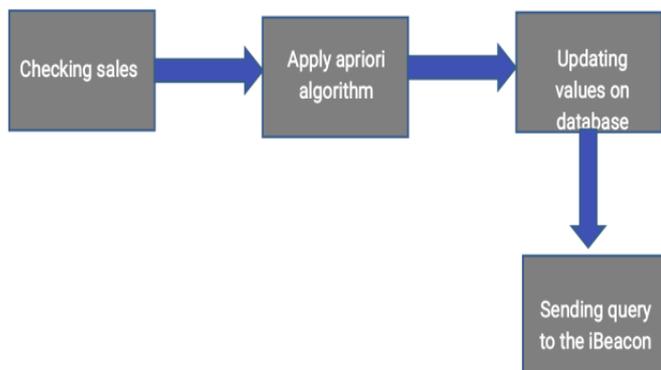
- .Net
- Mysql

For Mobile Application

- Platform:iOS 7.0.1+
- Source code:Objective C
- Development IDE :Xcode 7.0 BETA
- iBeacon/any apple device

4.WORK FLOW

Flowchart



- I. First we are creating the iOS application that detect the iBeacon and we are using iDevice that act as ibeacon. Then whenever we go near to the beacon range the app detects the IBeacon and shows the Offers.
- II. On the basis of sales i.e. which product sale is high and which product sale is low, we use Apriori algorithm on that database which create offer.
- III. Apriori algorithm is used for generating offers, for example: customer buy a milk then he also buys bread with it .Apriori algorithm generates offers by calculating support and confidence. FOR creating offers we are developing web application ,which is connected to the database .Using that database we are generating offers.

5. Problem Statement

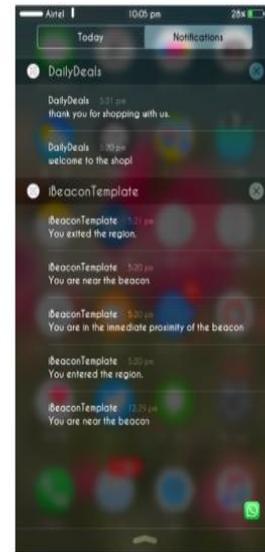
Whenever we go for shopping in a mall or in a shop we need to first find the owner or sale person to get info about them/products. We have to ask the owner or someone from the shop. Sometimes it becomes hectic to ask about products, sales, offers.

We want to solve this problem with the help of cell phone and a app .The app from the store will help and guide the customers about the product and offers from that store. This app will work with the iBeacon hardware to help the customer .This project will not only help customer but also the owner of the shop.

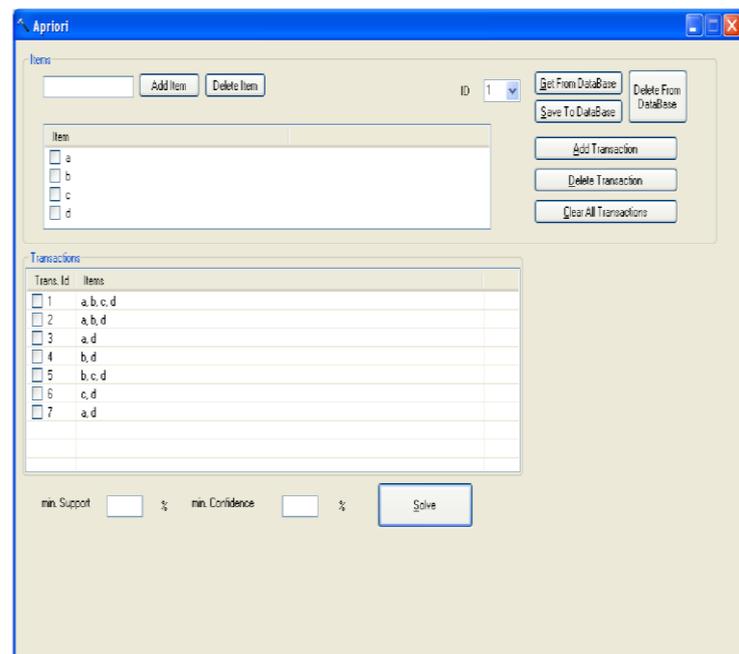
6. iBeacon

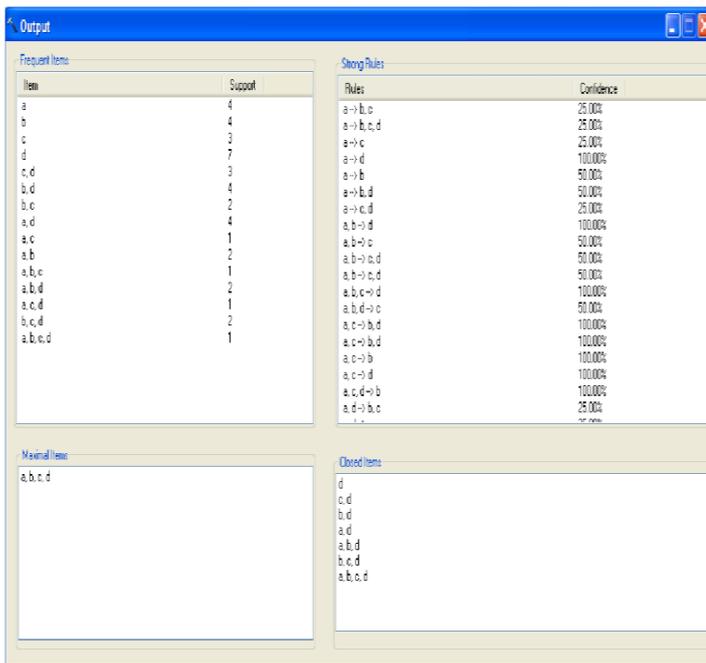
iBeacon is a protocol developed by Apple and introduced at the Apple Worldwide Developers conference in 2013. Various vendors have since made iBeacon-compatible hardware transmitters typically called beacons –a class of Bluetooth low energy(BLE) devices that broadcast their identifier to nearby portable electronic devices .iBeacon uses Bluetooth low energy proximity sensing to transmit a universally unique identifier picked and several bytes sent with it can be used to determine the device's physical location, track customers or trigger a location based action on the device such as a check in on social media or a push notification.

One application is distributing messages at a specific Point of Interest ,for example a store, a bus stop, room or a more specific location like a piece o furniture or a vending machine.Ibeacon can change the whole shopping experience in a shopping center.It starts at the entrance to the parking lots. An iBeacon will push a notification when you are planning to visit and the app will navigate you to the nearest parking lot[3].



7.Snapshots





Frequent Items		Strong Rules	
Item	Support	Rules	Confidence
a	4	a → b, c	25.00%
b	4	a → b, c, d	25.00%
c	3	a → c	25.00%
d	7	a → d	100.00%
c, d	3	a → b	50.00%
b, d	4	a → b, d	50.00%
b, c	2	a → c, d	25.00%
a, d	4	a, b → d	100.00%
a, c	1	a, b → c	50.00%
a, b	2	a, b → c, d	50.00%
a, b, c	1	a, b → c, d	50.00%
a, b, d	2	a, b, c → d	100.00%
a, c, d	1	a, b, d → c	50.00%
b, c, d	2	a, c → b, d	100.00%
a, b, c, d	1	a, c → b	100.00%
		a, c → d	100.00%
		a, c, d → b	100.00%
		a, d → b, c	25.00%

Maximal Items		Closed Items	
a, b, c, d		d	
		c, d	
		b, d	
		a, d	
		a, b, d	
		b, c, d	
		a, b, c, d	

REFERENCES

iBeacon

1. Kohne, M.; Sieck, J., "Location-Based Services with iBeacon Technology," *Artificial Intelligence, Modelling and Simulation (AIMS), 2014 2nd International Conference on* , vol., no., pp.315,321, 18-20 Nov. 2014
2. Theodore Antonakopoulos ., "A Bluetooth Smart Analyzer in iBeacon Networks", *2014 IEEE* ,978-1-4799-6165-8/14/2014 IEEE

Apriori

3. *International Journal of Computer Applications (0975 – 8887) Volume 74– No.14, July 2013*

8. CONCLUSION

This is the complete environment for the retail shops and shopping mails. These two modules (desktop app and mobile app) helps to analyze the database of shop and send the results to mobile devices in the form of notifications.

These type of projects can be implemented in museums, art galleries

iBeacon technology can be used in various applications such as in art galleries, retail shops and museums etc.

.Researcher working on automatic detection of iDevices, minimizing signal damping for long range detection. Apriori algorithm can be improvised by database scan .It requires some data structures to store transactions.