Generation of e-Tickets using Beacons for Smart Phones

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***Abstract*—**People keep visiting places like Railway stations, Zoo, Palace and Organized events etc. Where they will have to purchase entrance tickets by standing in a large queue. This implementation will generate e-Tickets using beacons. The beacon device broadcasts details using Bluetooth Low Energy. It will be beneficial for lot of people, since it saves time and provides an efficient way for purchasing tickets.

Keywords*—Beacons, BLE, e-Ticket, Events, Android*

I. INTRODUCTION

The major problem faced by visitors is waiting in queue for long time. Queues give physical discomfort as maximum time will be spent on waiting and usually people get bored. Even though ticket vending machine have been introduced it doesn't change the situation. Since most of the time these vending machines are out of order.

In this implementation the major focus is on the process of purchasing e-Tickets in an efficient and secured way. The only thing the user needs is a smartphone. When he/she enters the premises, they get notified and automatically e-tickets are generated. This technological assistance will reduce manual entry for simple tasks like ticket purchase and distribution. By using the recent BLE technology, it will help users to generate e-Tickets in swift manner. It also provides solution for visitors as per their aspiration. The administration can easily maintain records and it will increase their revenue.

II. PROBLEM STATEMENT

Visitors at public places like Zoo, Railway stations, Palace and also some Organized events always face long queue at the ticket counter. Estimated wait times leads people to anxiety, stress and uncertainty. The serpentine queue requires more floor space where the queues can form and this is one of the major drawback.

Assuming that approximately 10000 visitors visits places each day, hence nearly around thousands of tickets will be sold off on daily basis. So at an average of 10-15 min will be spent by each person waiting in a queue for purchasing tickets. During festival seasons the wait time may exceed which leads to inefficiency and waste of time.

The visiting time for places as well as any events are fixed to certain duration. So within that timespan the users need to purchase tickets. If more number of visitors arrive then there will be a rush. So ticket lending will be impossible for more number of people. Hence people tend to lose their patience and return back. This leads to uncertainty and loss of revenue.

III. PROPOSED SOLUTION

The proposed solution is to develop a mobile app that enables user to purchase e-Tickets without having to stand in a queue.

Nowadays everyone carries a smartphone where ever they go. The idea is to have an app for the smartphones (Android) that would buy tickets for the user. The prerequisites for this implementation is mobile device with BLE 4.0 enabled and also should have active internet connection.

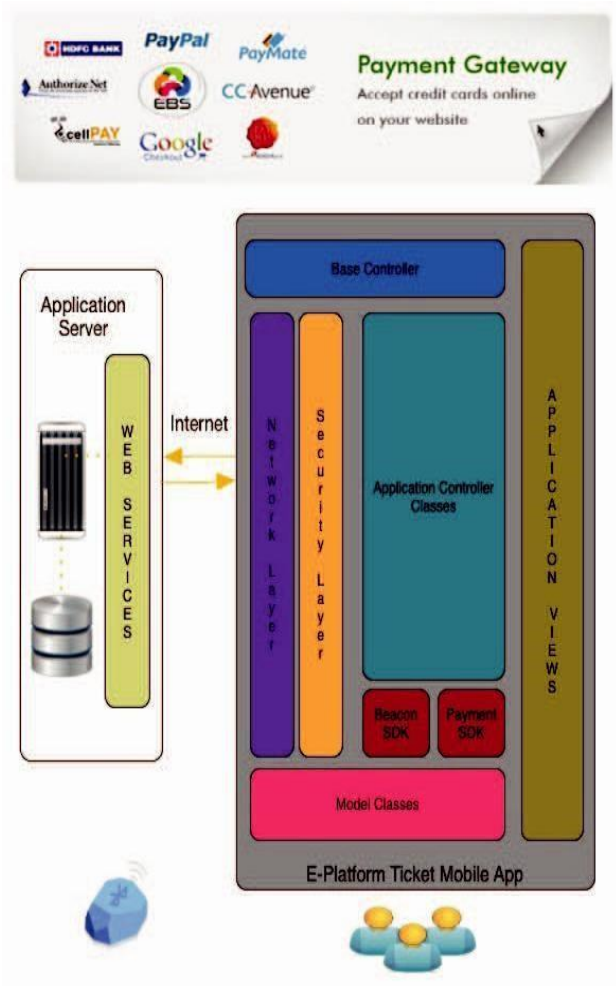
Beacon - A beacon is an intentionally conspicuous device designed to attract attention to a specific location.

BLE – Bluetooth Low Energy is a wireless personal area network technology designed and marketed by the Bluetooth Special Interest Group aimed at novel applications in the healthcare, fitness, beacons, security, and home entertainment industries.

Android - Android is a mobile operating system (OS) based on the Linux kernel and currently developed by Google.

The organized event counter and places like railway stations, zoo etc. should be fitted with beacons at specific locations. The user who are willing to purchase an e-Ticket needs to be within the specified range of the beacons. The user needs to open the app, to ensure that mobile phone is

paired up with the beacon. The Bluetooth will be automatically turned on and the users will have an option to purchase the e-Tickets. When the user opens the app it will be requested to the designated server along with a unique code that is acquired from the beacon. After authentication from the server the user details will be requested for the payment. This app includes many payment methods like credit card, debit card, PayTM etc. The app also includes default wallet mechanism from which we can pay directly for e-Tickets. The e-Ticket contains all the required details like date, time of purchase, number of persons, expiry date, expiry time. Once the process is completed an electronic ticket will be generated along with the verifiable QR code. The administrator/verifier can scan the code and get the details of the user.



A. Advantages

- Eradicates the old method of standing in a long queue- By generating e-Tickets automatically, we can overcome the traditional method of standing in a queue there by saving a lot of energy and time.
- Preventing loss of revenue- Persons entering without the ticket can be prevented by the secured QR code scanning.
- Ecofriendly – By preventing the usage of papers for issuing tickets, hence it helps to save our green environment.

B. Disadvantages

- The safety of the beacons cannot be ensured at any events.
- Smartphone must include BLE 4.0 feature and below that standard the beacons cannot be accessed.
- General public will not have the knowledge of the process of generation of e-Tickets.

C. Technical details

The module will comprise of a server and a client application for android platform. The client application will have the following requirements for the device-

- Android OS(4.1 or above)
- Device with BLE 4.0
- Support for beacon SDK
- Active Internet Connection

IV. IMPLEMENTATION

This implementation mainly contains three modules such as Administration, Counter and End user. The mobile application will connect with the backend web server to retrieve the necessary details. The communication takes place in a fully secured way. Server will have powerful infrastructure to handle 1000s of requests at any instance of time from the user.

A. Admin module

The admin will register and then login. Admin is authorized to manage events and maintain account details. Admin will also have an access towards counter and end user module.

B. Counter Module

The counters will contain beacons which will transmit the counter details. Counters will have scanner from which end user QR code will be verified and permit user entry. If multiple beacons are detected, the user has the choice to choose between any of the beacons.

i. Transmitter application

The device will use BLE 4.0(Bluetooth Low Energy) technology to locate and transmit beacon details. The maximum range of the beacons is around 70 meters and user within this range will be detected. Among multiple Counters, a counter is selected to generate a ticket within a beacon range. Beacons will transmit UUID (Universally Unique Identifier) which will be recognized by the application at user side to trigger actions.

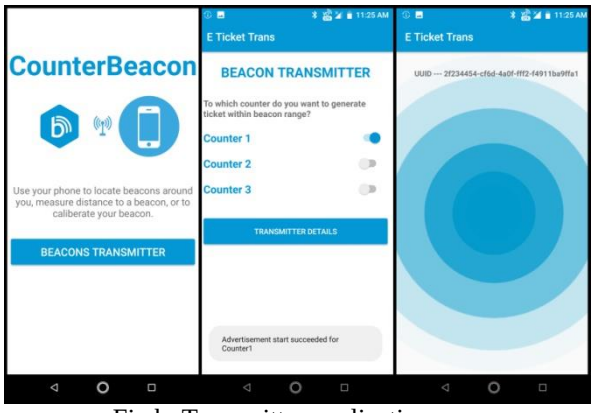


Fig b. Transmitter application

C. EndUser Module

The end user needs to register and login to the application. The user will have to choose from the respective venues displayed. After choosing venue the counters will be displayed. The user will select any of the available counters. The request for ticket purchase is made and various details like number of tickets, payment mode is selected. After the payment is made the e-Tickets are generated with unique QR code. The QR code will be verified by the verifier.

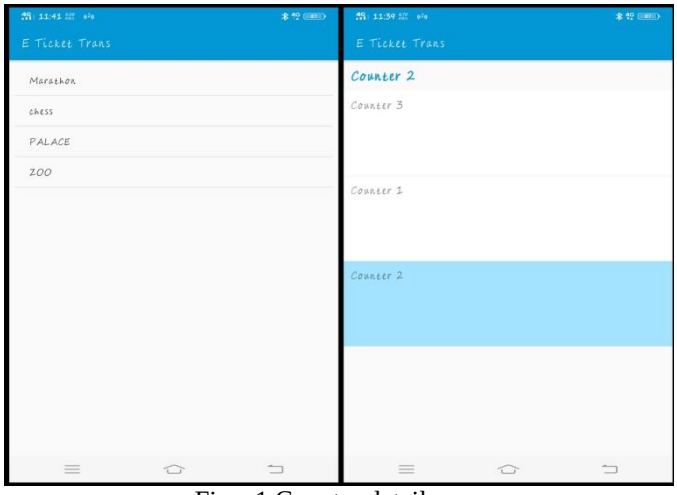


Fig c.1.Counter details.

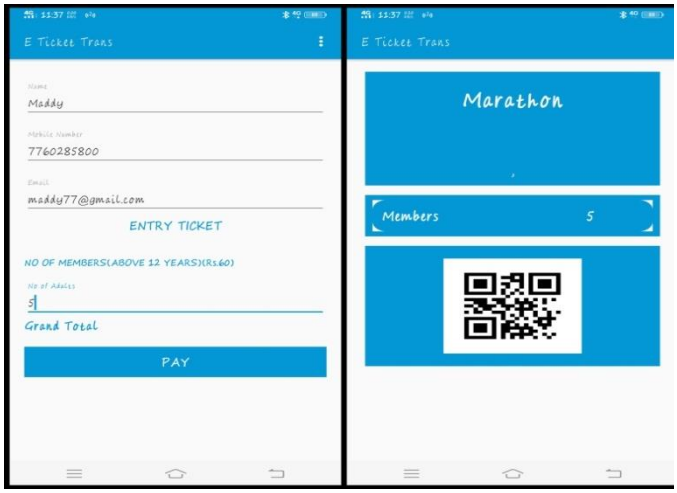


Fig c.2. Ticket details.

CONCLUSION

Technology has found a rapid growth nowadays in every sector but even though manual process for the citizens to stand in queue at the counters, collect ticket has become a huge task. The main object of this application is to reduce the effort of the citizen and save time by avoiding unwanted rushes at the counters and assure a smooth working schedule at the office. The main features include flexibility, reduce manual work in an efficient manner, quick and convenient process for both the officer and the user. By using the paperless work, it's easier to segregate and access data in conducive manner and also play a major role in conserving our nature. This type of system not only cut down the cost of process but also will increase the revenues. Since this technology used is the same, we try to develop a single application that can be accessible all across the India by partnership with the Government. The project could very well be enhanced further as per the requirements.

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