IMPLEMENTATION OF PROXIMITY BASED SERVICES IN THE CENTRAL LIBRARY, NITC

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Abstract:

Beacon is a bluetooth 4.0 proximity sensing device that can notify nearby bluetooth-enabled devices of their presence. They are discreet physical objects that can be put in physical locations allowing bluetooth-enabled smart-devices to interact with them through low-energy bluetooth signals. This report aims to brief the project details, work plan and the related works/implementations of the technology.

Introduction:

Beacon devices is a relatively new technology, first introduced by Apple in 2013. Since then, this technology has been put into tremendous use in the retail sales. Now Apple and Google have come up with their own beacon standards, “iBeacon” and “Eddystone”.

In this project, the aim is to setup the beacon device in the Central Library and guide the users to the book’s precise location in the stack room with the aid of a supporting android application. It would also be used to notify users about about various updates of the library (new books, journals, etc.).

With the successful implementation of this project, the users visiting the library would be able to search for a book on their mobile devices and would be guided to the book’s location in the stack room.

Motivation:

In the present scenario, a user who intends to borrow a book from the library, has to wait for their turn to search for a book in the systems present at the entrance of the stack room. A number of results would be displayed. He then has to make a note of the rack numbers of each of the books and then move around in search of the rack, which is annoying and laborious. It would be very convenient to the users if they had a mobile application where they could search for books and be guided to the book’s location instead of having to remember and search for the rack.

Related works:

Recently, many libraries in the US and UK have been starting to adopt the beacon technology. Like the ‘Boston Athenaeum’, Boston, Massachusetts and the ‘Orlando’s Orange County’ library system, Orlando. With this technology, these libraries are “able to inform patrons about services that matched their interests”. Within the library, beacons are being used to connect patrons with relevant electronic resources as they browse in specific sections of the library’s stacks or they could share instructions for technology in the library as patrons approach devices. This project is also along these lines, helping users to find their required materials easily and keeping them updated with the latest publications and arrivals.

Problem Statement:

To implement proximity based services powered by the beacon technology in the Central Library, NITC, to help the users find their required materials with ease and to keep them updated with the updates in the library.

High Level Design:

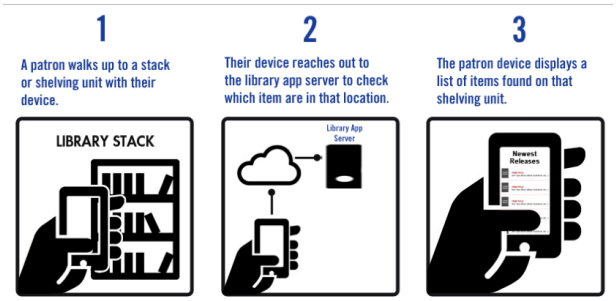
The expected outcome of the project is an android application which would interact with the beacon devices setup at suitable and appropriate locations around the stack room in the library. For the application development, the SDK provided by ‘Estimote’ (the beacon device manufacturer) would be used. Also, the Google API’s would be used to manage the devices and their broadcast parameters.

NB: As of now, the indoor SDK, which would enable the device to get the user’s location and help him navigate to the book rack is not available for android OS, but is available for the iOS. It is expected to be made available for android OS soon. If not, this functionality would be implemented for the iOS platform. (Only if all the required tools for the development are feasibly available).

Work Plan:

The beacon devices have already been shipped from ‘Estimote’, the device manufacturer. The whole project is planned to be implemented in three stages, by the end of this semester. The first stage - integrating the application with the device SDK. Second stage - Mapping of the library stack room racks with the books and their rack numbers (details to be taken from the library database) and implementing the proposed functionalities in the application. Third stage - Adding the navigation feature to the application (if feasible).

The flow of application is expected to be this way:



References:

There are no relevant IEEE papers to this project. However, a few relevant links to the SDK and API’s being used for this project are listed below:

- Google developers guide for beacons - https://developers.google.com/beacons/
- Beacons developer guide by Estimote - http://developer.estimote.com