Requirement Analysis: Beacon Integration

InboundRX Capstone Team
Version 1.0

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1. ***Introduction***
    a. **Purpose**

    Paulsen's Pharmacy is in need of an iOS app that their customers can use. This document outlines an addition to the core application: beacon integration.

2. ***Proposed System***
    a. **Estimote Beacons overview**

    Estimote beacons broadcast their ID's. Estimote beacons also broadcast information about signal power. The ID is used to identify the beacon, and the signal power is used to calculate the distance from the beacon The estimote beacon is not continuously broadcasting its signal. It broadcasting in intervals. The default advertising interval is set to 950 ms by default since on average, an iPhone is going to be scanning every second. If there is a lot of interference in the area, then it might be a good idea to lower the interval, so there is a higher chance of the phone picking up the signal. A beacon can have intervals of 100-2000ms. If the advertising interval were to be decreased to less than 500ms, then it will be able to have two intervals for every average iPhone scan. The estimote beacons are compatible with iBeacon, a communication protocol that Apple has built. Every estimote beacon has an iBeacon ID that is split into three parts. Every ID is 20 bytes long. 16 bytes is the UUID, or Universally Unique Identifier. Two bytes for "Major" ID, and two bytes for "Minor" ID. All three of these sections may be modified. A UUID has 32 hexadecimal digits. The default UUID for estimote beacons is B9407F30-F5F8-466E-AFF9-25556B57FE6D. The Major and Minor values are to distinguish the beacons with more accuracy. Minor and Major ID's are unsigned integer values between 0-65535.

    The estimote beacon works in two ways:

    1. Region Monitoring: When a user comes in and out of the geofence. This is monitored when in foreground and background.
    2. Ranging: Triggered when a certain proximity from the beacon. App must be in focus (foreground) for this to work.

    b. **Location Services**

    In iOS, it's necessary to ask the user for permission to access their location data. If the user does not consent to the Location Services option in the application, then the application will not be able to use any of the estimote beacon functions. Estimote beacons interact with the application in the background, so even if the application is in the background, interactions will still happen. Note that region monitoring and not ranging will be available in the background. The estimote beacon will monitor when a user comes in and out of its designated area using bluetooth.

    c. **SDK**

The estimote beacon can be integrated with the application. iBeacon is compatible with the estimote beacons we are working on. Estimote beacons come with an iOS SDK that will be useful when adding functionality to the system.