iBeacons

Table of Contents

1) Introduction:

Dotsquares has been helping organizations implement their IT vision for over 13 years and has a great track record in our projects providing tangible benefits and results. Our aim is to deliver value to our clients and we strongly believe that new technology needs a visionary IT company to help clients reap those benefits. Our vast experience comes from custom web application development and over the past few years we have become experts in native app development. As an extension to app development, we are delighted to introduce our clients to the possibilities of iBeacons.

From welcoming people as they arrive at a sporting event to providing information about a nearby museum exhibit, iBeacon opens a new world of possibilities for location awareness, and countless opportunities for interactivity between iOS devices and iBeacon hardware.
iBeacon is a new technology that extends Location Services in iOS. Your iOS device can alert apps when you approach or leave a location with an iBeacon. In addition to monitoring location, an app can estimate your proximity to an iBeacon (for example, a display or checkout counter in a retail store). Instead of using latitude and longitude to define the location, iBeacon uses a Bluetooth low energy signal, which iOS devices detect.

2) What is iBeacon (Beacons)?

The term iBeacon and Beacon are often used interchangeably. iBeacon is the name for Apple's technology standard, which allows Mobile Apps (running on both iOS and Android devices) to listen for signals from beacons in the physical world and react accordingly. In essence, iBeacon technology allows Mobile Apps to understand their position on a micro-local scale, and deliver hyper-contextual content to users based on location. The underlying communication technology is Bluetooth Low Energy.

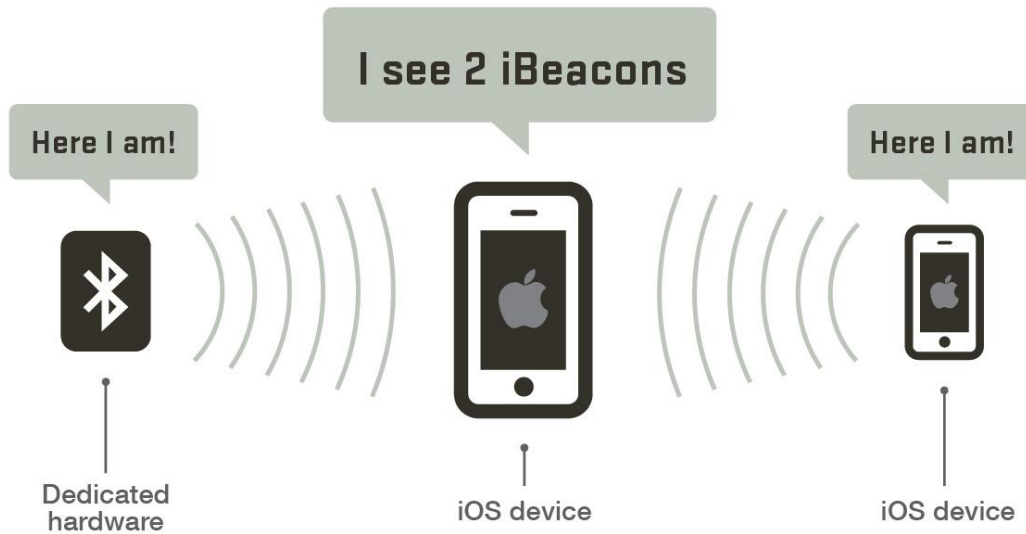UK Office: Unit 2, Albourne Court, Henfield Road, Albourne, West Sussex, BN6 9FF, UK

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3) iBeacon Technology:

iBeacon is a new technology that extends Location Services in iOS. Core concept behind this technology is BLE communication between iOs device and iBeacons.

What is Bluetooth Low Energy (BLE)?

Bluetooth Low Energy is a wireless personal area network technology used for transmitting data over short distances. As the name implies, it's designed for low energy consumption and cost, while maintaining a communication range similar to that of its predecessor, Classic Bluetooth.

How is BLE different from Regular Bluetooth?

- o Power Consumption: Bluetooth LE, as the name hints, has low energy requirements. It can last up to 3 years on a single coin cell battery.
- o Lower Cost: BLE is 60-80% cheaper than traditional Bluetooth.
- o Application: BLE is ideal for simple applications requiring small periodic transfers of data. Classic Bluetooth is preferred for more complex applications requiring consistent communication and more data throughput.

How does BLE communication work?

BLE communication consists primarily of "Advertisements", or small packets of data, broadcast at a regular interval by Beacons or other BLE enabled devices via radio waves.
BLE Advertising is a one-way communication method. Beacons that want to be "discovered" can broadcast, or "Advertise" self-contained packets of data in set intervals. These packets are meant to be collected by devices like smart phones, where they can be used for a variety of smart phone applications to trigger things like push messages, app actions, and prompts.

Apple's iBeacon standard calls for an optimal broadcast interval of 100 ms. Broadcasting more frequently uses more battery life but allows for quicker discovery by smart phones and other listening devices. Standard BLE has a broadcast range of up to 100 meters, which make Beacons ideal for indoor location tracking and awareness.

4) Programming with iBeacons

Programming with iBeacons is very simple. iBeacons use Bluetooth LE technology, so you must possess an iOS device with built-in Bluetooth LE to work with iBeacons. The list currently includes the following devices:

- iPhone 4s or later

- 3rd generation iPad or later

- iPad Mini or later

- 5th generation iPod touch or later

iBeacons are pre-programmed to broadcast a specific UUID, major and minor combination.

UUID, Major, and Minor identifiers:

UUID is an acronym for *universally unique identifier*, which is effectively a random string; *B558CBDA-4472-4211-A350-FF1196FFE8C8* is one example. In the context of iBeacons, a UUID is generally used to represent your top-level identity. If you generate a UUID as a developer and assign it to your iBeacon device, then when a device detects your iBeacon it knows exactly which iBeacon it's talking to.

Major and minor values provide a little more granularity on top of the UUID. These values are simply 16 bit unsigned integers that identify each individual iBeacon, even ones with the same UUID.

For instance, if you owned multiple department stores you might have all of your iBeacons emit the same UUID, but each store would have its own major value, and each department within that store would have its own minor value. Your app could then respond to an iBeacon located in the shoe department of your Miami, Florida store.

Listening for Your iBeacon:

Your device won't listen for your iBeacon automatically — you have to tell it to do this first. The CLBeaconRegionclass represents an iBeacon; the *CL* class prefix infers that it is part of the Core Location framework.

It may seem strange for an iBeacon to be related to Core Location since it's a Bluetooth device, but consider that iBeacons provide micro-location awareness while GPS provides macro-location awareness. You would

leverage the Core Bluetooth framework for iBeacons when programming an iOS device to act as an iBeacon, but when monitoring for iBeacons you only need to work with Core Location.

```objc
#import <Foundation/Foundation.h>

@import CoreLocation;

@interface RWTItem : NSObject <NSCoding>

@property (strong, nonatomic, readonly) NSString *name;
@property (strong, nonatomic, readonly) NSUUID *uuid;
@property (assign, nonatomic, readonly) CLBeaconMajorValue majorValue;
@property (assign, nonatomic, readonly) CLBeaconMinorValue minorValue;

- (instancetype)initWithName:(NSString *)name
                        uuid:(NSUUID *)uuid
                       major:(CLBeaconMajorValue)major
                       minor:(CLBeaconMinorValue)minor;


@end
```

For iBeacon development you can get sample from here

5) Use of iBeacons:

Generally speaking iBeacons are all about improving the user and customer experience through interconnected devices providing on the spot, relevant and targeted communications. This technology is only limited by our imagination and we have outlined a few possible uses below.

- **Retailers**: With an iBeacon network, any brand, retailer, app, or platform will be able to understand exactly where a customer is in the brick and mortar environment. This provides an opportunity to send customers highly contextual, hyper-local, meaningful messages and advertisements on their smartphones.

- **Conferences:** iBeacons can be used to create an engaging and informative conference experience. The network can alert delegates that a particular keynote speaker or trade stand is open based upon previous analytics and even guide them to the correct location within the conference venue. By making a sometimes daunting environment friendly, your conference or show will benefit from a more engaged and informed audience.

- **Lifestyle:** A new term within IT is the "Internet of Things". This describes the interconnected world we now live in where devices link with devices to create a highly evolved network. iBeacons forms an important part of this network; its applications for non commercial use are limited only to imagination. From monitoring energy outputs whilst playing sports through an enabled watch to Google Glass there are plenty of ways in which iBeacons can be utilized to transform your digital lifestyle experience.

- **Airports**: Touted as an innovator in the airline industry, Virgin Atlantic began an iBeacon trial in the Upper Class Wing at London's Heathrow Airport in May 2014. Virgin's premium passengers were able to receive personalized notifications and offers via their iPhones. At the beginning of the trial, Virgin used beacons to alert customers to have their electronic boarding passes ready when they were close to a private security check, and to send tailored offers like commission-free currency exchange deals to passengers in the departures section of the airport. Virgin also used beacon tech to let passengers know about in-flight entertainment specials before they boarded the plane, and to let their staff know when temperatures dropped on outdoor decks of their airport lounges so they could give blankets to passengers.

- **Dating:** The Dating App, "Mingleton", uses iBeacon to connect singles in the same vicinity and leverages the core Bluetooth and location technology inherent in the iPhone itself. Many consider this to be like Tinder for the immediate vicinity.

- **Location:** Nivea uses iBeacons to help parents keep track of their children at the beach. Through an enabled bracelet, parents' can set a "safe zone" at the beach and if a child wanders outside the zone, the parents' iPhone alarm will start ringing.

- **And many more….**

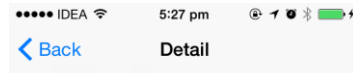UK Office: Unit 2, Albourne Court, Henfield Road, Albourne, West Sussex, BN6 9FF, UK

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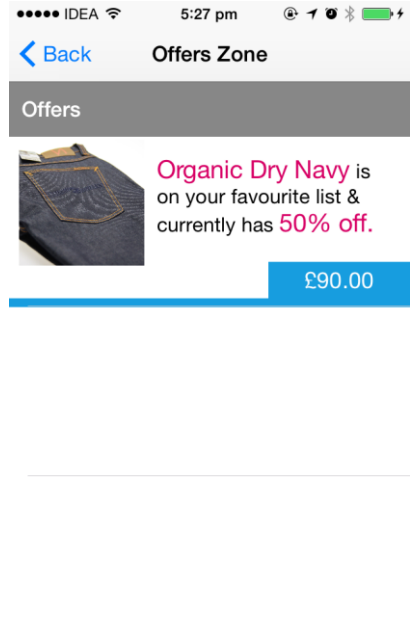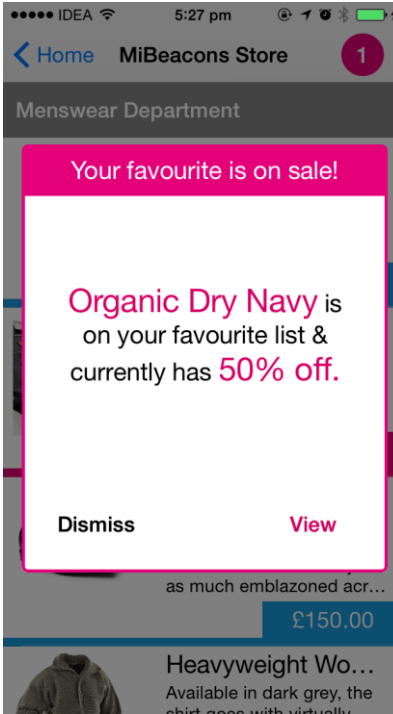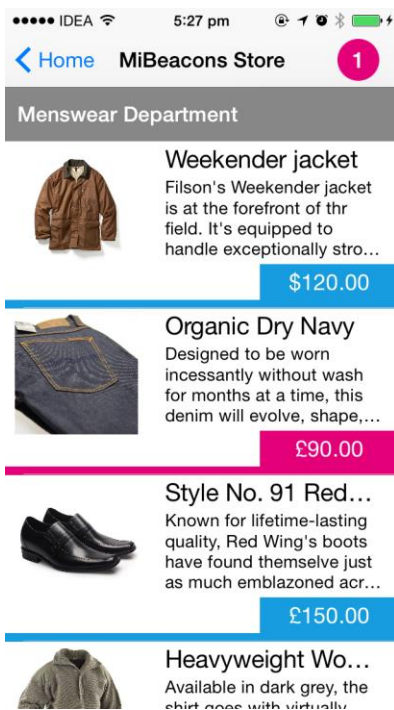
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6) Work reference:

We have developed a demo app that interacts with iBecaons. In this application we have programmed 3

iBeacons with these UDIDs.

- FFFB489A-8681-4F0F-8DFD-00873FD43A2C
- 755A8930-BD87-46EB-95E6-7BBD89ED8370
- B5283266-8E08-43D5-9110-43F47219B48B

Steps to install app & test iBeacons

1. Install iPhone app from here http://install.diawi.com/6QxxJY
2. Keep these 3 iBeacons on distance of atleast 5 meters.
3. Open iBeacon app and move to iBeacon 1. It will show you a popup with offer 1.
4. Then move to iBecaon 2. It will show you another offer.
5. Finally when you reach to iBeacon 3. It will show you another offer for that particular this iBeacon is programmed.

Screens of our App

Organic Dry Navy

Description:
Designed to be worn incessantly
without wash for months at a time,
this denim will evolve, shape, and
age to fit you perfectly.

Price : £90.00
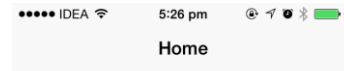
iBeacon

Retail

If your vision for clients involve an exception user experience while utilizing the latest technologies with tangible benefits, please contact us at info@dotsquares.com or give us a call at 01273 575190. We will be delighted in assisting you create a unique experience for your clients.