In-Store Mobile Consumer App Project

Shimon, Wesley, Jing, Brian
Today’s Agenda

○ Overview
○ Problem Space
○ Features
○ User Story
○ Technology
  ○ Map Interface Demo
○ Prototype Design Demo
○ Conclusion
○ Q & A
Overview

- Semester long field project led by Professor Pito Salas and Technical Lead Mia Stern at Demandware
- Our mission was to create the proof of concept for a consumer mobile app used primarily in-store
- We investigated competing apps and technologies, and came up with specific, customer-validated, technically feasible proofs of concept for such an application
- Let’s dive right in...
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Brandeis X Demandware

THE NEXT GENERATION OF IN STORE SHOPPING

TELL ME MORE
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Technology

Beacons:

“Eyes for your blind phone in the pocket”

- Bluetooth Low Energy Signals
- 2.5 - 3 year battery life

Accuracy:

- Ranging: < 10 cm
- Location: < 2 m

- Range Up to 70 m
- Additional Motion/ Temperature Sensors
Our Choice of Beacons:

*Estimote, an Y Combinator Graduate*

Estimote is an open platform with demo apps and source code on Github

Well documented development guideline

Good Q&A page

Other Options:

Swirl, Radius Network, Onyx, etc.
Technology

Background Monitoring/Ranging System

Setup Listener:

Listen to a set of beacons with the same UUID for the **Burlington store**
Listen to a set of beacons with Major/Minor number > 100 for the **clothing section**
Listen to a single beacon with Major/Minor number = 100 for just the **sweatshirt aisle**

Enter/Exit Trigger Function:

Push notification for sales and recommendation
Initiate/terminate timer for behavior analysis
Technology

Indoor Location System

Precise blue-dot location services indoors using trilateration of signal strength

How does it work?

1. **Place** beacons on each wall
2. **Map** the border of the space using Estimote Indoor Location App, which will upload the configuration to the Estimote Cloud
3. **Link** the configuration from the cloud in the application and start fetching location
4. **Call** delegated function to get Location object, which includes coordinate and orientation

Caveat:

Our mapping successful rate is 30%, so it takes some time to do the configuration, especially for large spaces
Technology
Potential Problems with Beacons

**From Beacons to Application:**

- Streamline the process of setting up beacons in store
- Configure information in application

**Scaling:**

- 3 beacons -> 30 beacons
- Optimize the layout and maintain the beacon

**Indoor Location Accuracy:**

< 2 m
Technology
Map Interface

A simple way to get indoor layout map with matured map system

STEP 1
Locate
Find the building on the map.

STEP 2
Upload
Upload pictures of your floor plans or directories of a floor.

STEP 3
Line up
Line up your floor plan with satellite images in Google Maps.

STEP 4
Submit
Submit! This will help us improve Google Maps.

Google Indoor Map

Apple Indoor Map
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✓ Conclusion
✓ Q & A
Map Interface Demo

We want to map **Beacon** Coordinates onto the **Google Maps** Coordinates

Mercator Projection

longitude -> x'
latitude -> y'

x'
y'

Beacon Coordinates

longitude -> x'
latitude -> y'

x'
y'
Technology

Fingerprint Payment

Make purchases with a single touch
  billing
  shipping
  contact details

Prerequisite for **Apple Pay** in-app purchase API:

  In addition to implementing Apple Pay with the PassKit framework, which will release the payment credential token, you must:

  - Set up an account with **a payment processor or gateway**, if you don’t already have one. You can find a list on developer.apple.com/apple-pay.
  - Register a **Merchant Identifier** via Certificates, Identifiers & Profiles
  - Submit a **Certificate Signing Request** to obtain Public and Private keys that will be used to encrypt and decrypt Payment Tokens
  - Include an **Apple Pay entitlement** in your app.

**Android Pay** in-app purchase API is on its way
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Prototype Design Demo

User-story:

Mary
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Conclusion

- Website: [https://BrandeisXDemandware.github.io](https://BrandeisXDemandware.github.io)
- Github Repo: [https://github.com/BrandeisXDemandware](https://github.com/BrandeisXDemandware)  
  open source under the MIT licence
- Presentation: [http://tinyurl.com/demandwarexbrandeis](http://tinyurl.com/demandwarexbrandeis)
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Thank you!

Mia Stern
Amy Croot
Gilberte Houbart
Demandware Team
Pito Salas