CMPUT 401: Requirements Document and Plan V1

Project: Scout

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Project Overview:

The objective of this project is to test the effectiveness of a new technology in gathering customer data. The main user base will be business owners that wish to track information about their own customers. This new technology is tentatively Bluetooth wireless technology. Data that is collected may include the number of customers that enter a business owner's building, the amount of time that a customer was in the building for, and the frequency of which a customer visits the building. Ideally, the developed system will include an app, which resides on the customer's phone, Bluetooth sensors that communicate with the app, and a web service for which the app can relay this information. The envisioned system will work as follows:

1. One or more Bluetooth sensors will be placed within area of interests within a business owner's business location. For example, in a grocery store, two Bluetooth sensors can be placed in the produce aisle and the snacks aisle.
2. A customer will enter one of the business locations, and when the customer's phone is within proximity of a Bluetooth sensor, the Bluetooth sensor will relay its ID to the customer's phone.
3. Our app on the customer's phone will then query this information to our database using the web service.
4. The business owner (i.e. our customer) will then be able to view the information about their customers on the web server's dashboard. For example, they can identify how long a customer was in the produce aisle.

Planning:

Release Plan:

Story ID	User Story	Priority	Story Points	Sprint
1	As a customer, I'd like to sign in and interact with the business with a smartphone application	High	5	1
2	As a customer, I'd like to register for the service using my smartphone application	Medium	3	1
4	As a customer. I'd like to be able to view the number of points I have on my smartphone	Medium	3	1

7	As a business owner, I'd like to be able to install BLE sensors to interact with customer smartphones	High	8	1
11	As a business owner, I'd like to add to a list of available rewards for my business for redemption for a number of points	Medium	3	1
12	As a business owner, I'd like to use an online dashboard to view the number of new customers at my store	Medium	3	4
15	As a business owner, I'd like to keep track of how long customers have stayed in my business	High	8	3
18	As a customer, I want the mobile app to be fast and responsive	Low	5	
19	As a business owner, I want the web dashboard to be fast and responsive	Low	5	
22	As a business owner, I'd like to be able to track a customer's approximate location within a certain radius of the beacon	High	8	2
23	As a business owner, I'd like to utilize the hardware's ability to trilaterate the user's approximate movement within the store	High	13	2
24	As a customer, I'd like to be rewarded points for visiting a business once a day.	Medium	3	2
26	As a business owner, I want the app to run in the background to collect the data	High	8	2
27	As a business owner, I want the average time a customer was in the store to be visible on my dashboard	Medium	2	4
28	As a business owner, I want to know the number of points I have given customers visible on my dashboard	Medium	2	4
29	As a customer, I would like to be able to sign in to the mobile application	High	2	1
30	As a customer, I want to be able to redeem my points for rewards	Medium	3	3

31	As a business owner, I want to be able to sign in onto an online dashboard	High	5	1
33	As a customer, I want the minimum amount of defects in the mobile app	Low	8	5
34	As a business owner, I want a minimum amount of defects in the web dashboard	Low	8	5
35	As a business owner, I'd like to be able to visually see a heat map of my store on the web dashboard	High	21	3
36	As a business owner, I'd like to be able to see the movement of the customers on my dashboard within the heat map	High	21	4

Release Story Map:

Sprint	Smartphone App	Dashboard	BLE Beacon
1	As a customer, I'd like to interact with the business with a smartphone application		
	As a customer, I'd like to register for the service using my smartphone application		
			As a business owner, I'd like to be able to install BLE sensors to interact with customer smartphones
		As a business owner, I want to be able to sign in into an online dashboard	
	As a customer, I would like to be able to sign in to the mobile application		
		As a business owner, I'd like to add to a list of available rewards for my business for redemption for a number of points	

	As a customer. I'd like to be able to view the number of points I have on my smartphone		
2			As a business owner, I'd like to be able to track a customer's approximate location within a certain radius of the beacon
			As a business owner, I'd like to utilize the hardware's ability to trilaterate the user's approximate movement within the store
	As a business owner, I want the app to run in the background to collect the data		
	As a customer, I'd like to be rewarded points for visiting a business once a day.		
3	As a customer, I want to be able to redeem my points for rewards		
		As a business owner, I'd like to keep track of how long customers have stayed in my business	
		As a business owner, I'd like to be able to visually see a heat map of my store on the web dashboard	
4		As a business owner, I'd like to be able to see the movement of the customers on my	

		dashboard within the heat map	
		As a business owner, I'd like to use an online dashboard to view the number of new customers at my store	
		As a business owner, I want to know the number of points I have given customers visible on my dashboard	
		As a business owner, I want the average time a customer was in the store to be visible on my dashboard	
5		As a business owner, I want a minimum amount of defects in the web dashboard	
	As a customer, I want the minimum amount of defects in the mobile app		
	As a customer, I want the mobile app to be fast and responsive		
		As a business owner, I want the web dashboard to be fast and responsive	

Project Glossary:

BLE (Bluetooth Low Energy) - This is the specification for one type of signal that beacons transmit. There are other types of signals that power beacons (e.g. audio signals) but Bluetooth LE has the advantage that it is low energy and is 'native' to most modern phones and tablets. Utilizes Bluetooth smart technology and aimed at providing a source of longevity application for healthcare, fitness and marketing groups with low energy consumption while withholding its broadcast range.

Trilateration - Precise and/or relative location pinpointing given 3 different sources of emitting signals. The signals usually come as either Bluetooth or Wi-Fi. The location of the device is determined given the signal strength of the different sources emitted around the device. The signal strength is usually measured in dBm (decibel-milliwatts).

Beacon - Any device that transmits a signal which allows another device to determine its proximity to the broadcaster. The beacon doesn't transmit *content*, it simply transmits a signal that lets a user's phone or tablet figure out what its proximity to the beacon.

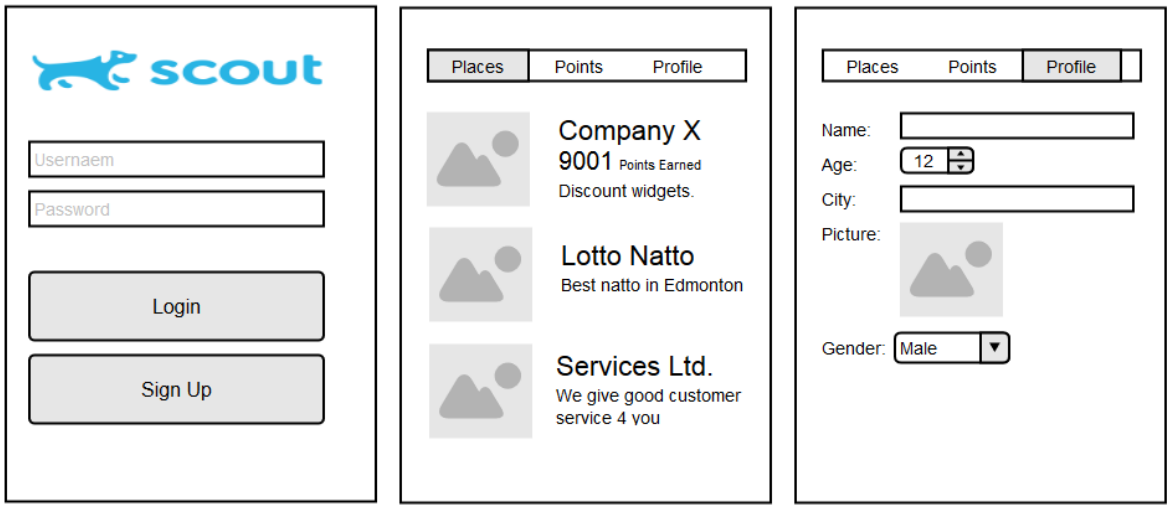
iBeacon - Apple trademarked Bluetooth system that interacts with current iOS device via Bluetooth technology. Consists of protocols, devices and uses of Bluetooth LE to interact with iOS devices. Normally, the beacons are simply informing nearby Bluetooth enabled ios devices of its presence and its up to the applications on the phone to handle the available information. However, currently many iBeacon applications have extended their compatibility to android devices.

Points - The points system within the application will provide users with incentives to often visit stores. Currently as discussed, the points will be cumulated depending on the customer's frequency on visiting the said merchant. The points can then be spent by the customers with rules given by the business owners.

Dashboard - A web user interface that allows the users to define and control how points and rewards are delivered to the customers. As well as it displays the information collected from the customers in a meaningful manner.

Story Board:

The App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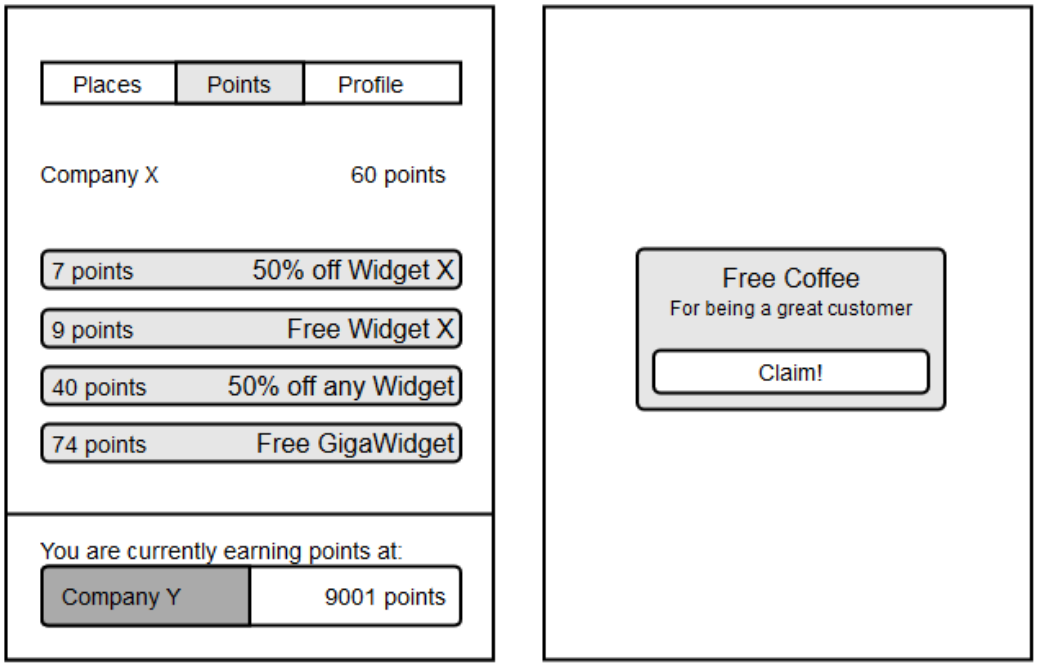
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7 points
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9 points
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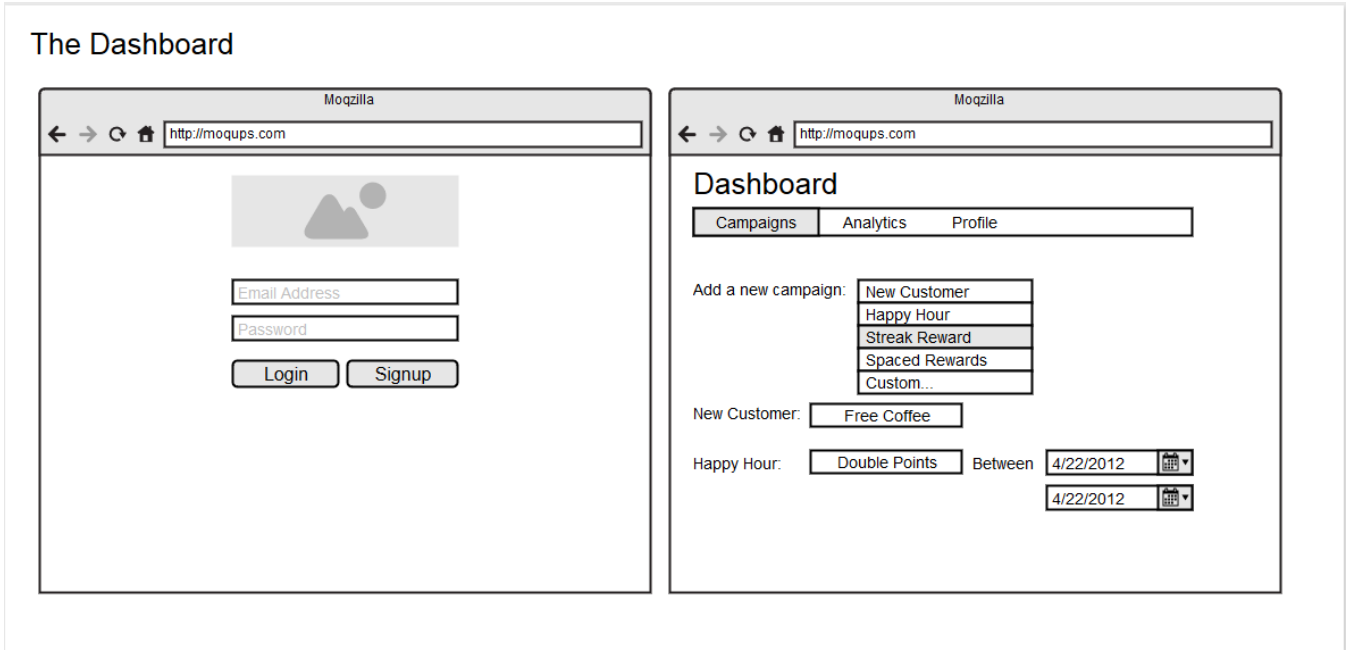
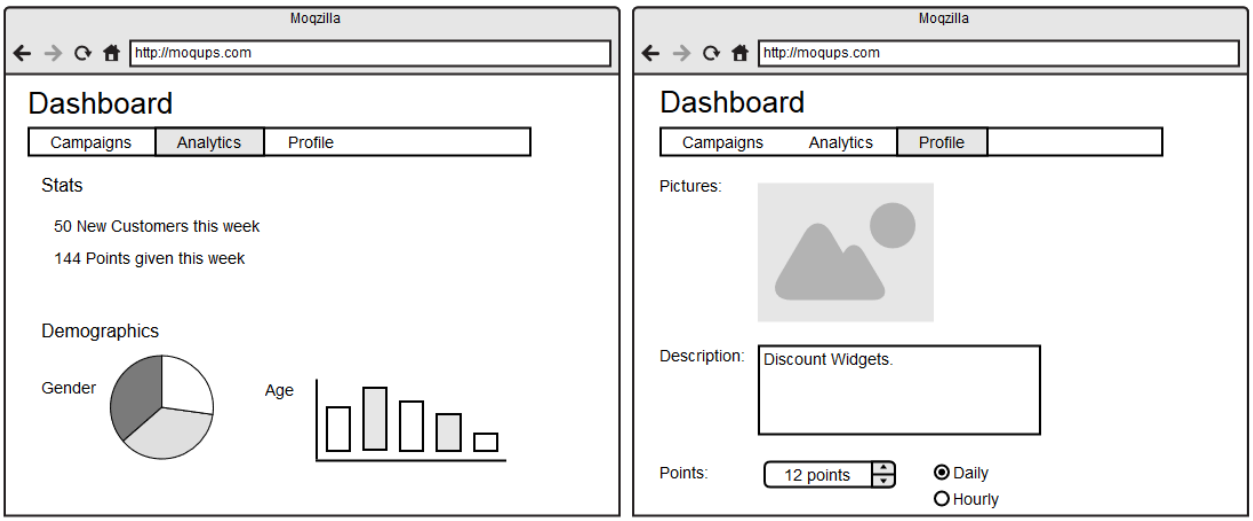
Company Y
9001 points
Free Coffee
For being a great customer
Claim!





References:

http://www.aislelabs.com/reports/beacon-guide/

Hardware Specifications: (Compiled Table of Most Viable Hardware Solutions:)

Product	Estimote:	Radbeacon	Kontakt.io	Kontakt.io Cloud Beacon	Qualcomm Gimbal:

	Beacon or Stickers Dev Kit				Proximity Beacon Series 21
Website	http://estimote.com/	http://store.radiusnetworks.com/collections/all/products/radbeacon-usb-2	http://kontakt.io/our-technology/kontakt-io-beacons-features-list/	http://kontakt.io/our-technology/introducing-kontakt-io-cloud-beacon/	http://www.gimbal.com/
Form Factor:	Sticker or Standalone device	USB Dongle	Stand alone device	Wifi Standalone Device	Standalone device
Cost:	$99 for a set of 3 beacons	$21 per beacon	$27 per beacon	$79 per beacon	$30 per beacon
Battery Life:	22.2 months (Non replaceable)	N/A	24.3 months (1 large coin battery)	24 months (4 coin batteries) Can be plugged in to wall	18 months 4 AA alkaline batteries (Replaceable)
Range:	70 meters	30 meters	70 meters	Bluetooth: Up to 70 meters Wi-Fi: Up to 200 meters	50 meters
Compatibility:	iOS & Android	iOS & Android	iOS & Android	iOS & Android	iOS & Android
Extra Notes:	• Most well-known and established in beacon technology			• Uses built-in WiFi to reach the Internet	• Enterprise-level backend support for large companies looking for corporate-level solution(s).
Problems:	•http://beekn.net/2014/02/problems-estimote/ • 4+ weeks for delivery			• Uses Kontakt.io propietary servers	• Pay per-user fee •https://manager.gimbal.com/fee-schedule
SDK:	http://estimote.com/indoor/	https://github.com/AltBeacon/android-beacon-library	http://docs.kontakt.io/	http://docs.kontakt.io/	https://gimbal.com/doc/android_quickstart.html

https://docs.google.com/a/ualberta.ca/spreadsheets/d/1V8j8bxt7BNu-hCfx5GgsOEaf7oCA0U9DALL8bfgfEgU/edit#gid=0

Beacon Technology Overview:
http://www.fosbury.co/beacon-comparison

http://beekn.net/guide-to-ibeacons/

http://www.nodesagency.com/list-9-biggest-beacon-manufacturers/

IBeacon Dev Tutorials:

http://vincenth.net/blog/archive/2014/04/24/building-cross-platform-ibeacon-apps-for-ios-android-and-windows-with-c-and-xamarin.aspx

http://thenewstack.io/building-an-ibeacon-app/

http://beekn.net/developing-ibeacon-app/

Bluetooth Technologies Overview:
http://www.ti.com/lsds/ti/wireless_connectivity/bluetooth_bluetooth-ble/overview.page

Bluetooth Smart (4.0 or newer) device is required, and the Android API 18 (Android 4.3) must be supported.

- Note: Nexus 7 and Nexus 10 (2012) with Android 4.3+ is not delivered with BLE enabled. To work with BLE, the Bluetooth Low Energy Enabler tool is needed.

Competing/Similar Products:
http://app.onepouch.com/features

https://www.passbeemedia.com/

https://passkit.com/digital-loyalty-cards/

Glossary Definitions:
http://en.wikipedia.org/wiki/IBeacon

https://cseweb.ucsd.edu/classes/fa06/cse237a/finalproj/almula.pdf

http://www.bluetooth.com/Pages/low-energy-tech-info.aspx