Bluetooth Beacon
Business Opportunities, 2015-2020

Bringing Places & Objects to Life

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I. Executive Summary

Bluetooth beacons are going to be very successful. There are many compelling applications and sizable markets. As always, the question is when and how will Bluetooth beacons succeed? Success may be delayed, but it will not be denied.

Bluetooth beacons are a powerful complement to two of the world’s most successful technologies. By themselves, Bluetooth beacons do very little. When combined with the Internet and ubiquitous mobile communication, they bring places and things to life.

That means presenting information about nearby places and objects that is useful or interesting. It also means interacting with smart device users in specific ways as they move about and see or touch objects. The possibilities for superior user experiences are endless.

Bluetooth beacons are simple and inexpensive. The typical Bluetooth beacon broadcasts the same short message over and over. Bluetooth benefits from high volume production: virtually all mobile phones support it. Bluetooth beacons come in a variety of forms and configurations, and can run for years off the same batteries.

Bluetooth beacons address the demand for indoor locating. Cell towers, GPS, and Wi-Fi can locate users outdoors, but they lack the coverage and resolution required indoors. Fixed Bluetooth beacons will be combined with other technologies to make indoor positioning ubiquitous and accurate. Mobile Bluetooth beacons will be used to track people and objects ranging from personal key chains to large dump trucks costing $millions.

Although Bluetooth beacons are essentially electronic markers, they do more than just identify places and things. They can trigger context-aware actions and interactions. Bluetooth beacons enable merchants to observe and respond scientifically to shopper behavior. Venue operators can use them to monitor foot traffic and make adjustments. Bluetooth beacons enable consumers to find misplaced phones, keys, and remote controls as well as keep an eye on small
children and forgetful senior citizens. All of this is made possible by the ability to associate places, objects, people, and user behaviors with specific content.

1. Can Bluetooth Beacons Revive Retail Store Sales Growth?

The most talked-about application for Bluetooth beacons is interacting with shoppers in retail stores. Online sales are growing faster than in-store sales. The retail industry is trying to counter this trend by enhancing the shopping experiences of people with smart devices. Leveraging computer automation and big data, stores hope to achieve greater operating efficiency and higher conversion rates (sales).

Bluetooth beacons enable big retail chains to provide the kind of personalized service that was the hallmark of small neighborhood stores. They make shopping in physical stores more convenient and satisfying by showing users where items are located, helping them evaluate and compare products, and presenting them with real-time offers.

Time is running out. While online sales are currently a small percentage of total retail sales (about 6%), online sales are growing about three times as fast. At that rate, online sales will exceed 10% of total retail sales by 2019. That’s significant erosion for struggling retailers.

Plus, it’s going to take time for Bluetooth beacons to make a difference. There needs to be a critical mass of beacons in the field and a critical mass of consumers with the right devices and software. Merchants must learn how to leverage beacons and they must convince shoppers to opt in (using mobile apps, Physical Web browsers, or other solutions). A few restaurant chains—most notably Starbucks and Domino’s—have shown that consumers can be enticed to download and use a merchant’s app if it offers the right mix of functionality, ease of use, and reliability.

Today, every merchant wants consumers to use their branded app. Branded apps give merchants the power to collect and analyze data, create and test marketing campaigns, and add features. Unfortunately, designing and maintaining a great shopping app is not easy. Shared apps and advertising networks offer merchants immediate access to a large base of users, but they give merchants less control. Most merchants would be wise to pursue both approaches.
There are effective ways to entice consumers to download and try a shopping app. An immediate discount or giveaway often works. The value of creating shopping lists, previewing items, and navigating large stores should not be underestimated. People today lead busy lives and anything that helps them make optimal use of their time and money is appreciated.

New technologies often raise privacy concerns. Most vendors and retailers are committed to only using beacons in ways that build user trust: keeping shoppers’ identities anonymous, making it easy for them to opt out, and not inundating them with messages. As we’ve seen on the Web, however, most users will sacrifice some privacy for utility. (Apple also polices the iTunes store to prevent unauthorized apps from hijacking iBeacons.)

Soon most people will carry devices that can interact with Bluetooth beacons. As of September 2014, 72% of adults in the United States had a smartphone, and 85% of new phones purchased were smartphones. However, beacons only work with devices running iOS 7 or later and Android 4.3 or later.

Retail store operators are betting that, with some exceptions, people will continue to appreciate seeing products in person and taking their purchases home. But the world has changed and physical stores must adapt. Retail shelf space is more valuable than warehouse space and this must be reflected in prices. Stores staffed with salespersons, stock clerks, and cashiers have greater overhead. Like it or not, Bluetooth beacons must not only deliver superior shopping experiences, they must reduce store costs through automation. Older shoppers may miss the human touch. Younger shoppers prefer self-service. Most merchants just want to maximize sales and Bluetooth beacons offer the most scientific approach. Beacons can even be used to make an online sale while the shopper is still in the store. For instance, an online discount can be offered as the shopper moves toward the exit.
By observing shopping behavior in stores over time—responses to physical surroundings, alerts, and offers—the industry will learn how to maximize conversion rates. Online conversion rates are said to range from 3% to 10%. In-store conversion rates are reportedly much higher (20 - 30%) but declining. The most likely explanation is that browsing online is easy, but when people go to physical stores they have probably made up their minds to buy something. It’s also easier to persuade someone who is in a store that has the item in stock than to persuade someone who is online, must wait for delivery, and suspects a better deal is just around the corner.

Most of the top 100 retail chains are expected to test Bluetooth beacons by the end of 2015. According to one survey, by 2019 nearly three-quarters of retailers expect to be able to identify customers the moment they walk in the door. Many pundits predict there will be millions of Bluetooth beacons deployed by that time. That suggests a big push to get consumers to
download store merchants’ apps is coming: While up to 75% of shoppers use their smartphones while shopping in stores,¹ surveys indicate that two-thirds use Web sites rather than mobile apps.²

There is conflicting evidence about how merchants can best exploit shopping apps. The beacon industry urges retailers not to inundate shoppers with notifications and offers. Yet numerous surveys indicate that users appreciate receiving coupons that can be instantly applied to their purchases. According to Google, people who use smartphones while shopping also tend to spend more.³ However, shoppers are discouraged by apps that won’t open, crash frequently, or have features that don’t work properly.

The role of Bluetooth beacons in physical stores is likely to vary by retail segment. People need the most help finding items in grocery, drug, home improvement, and department stores. The case for Bluetooth beacons in furniture and sporting goods stores seems less compelling. Long-term, the retail store market is a small part of the Bluetooth beacon opportunity.

Bluetooth beacons may turn out to be indispensable for bricks and mortar retail chains. However, retailers are just beginning to learn how smartphone interaction can drive sales. Our study on the use of connected technology by restaurants found that only four of the top 100 chains have large numbers of mobile app users. Retail store chains are also likely to find the early going rough.

2. Compelling Vertical Markets for Bluetooth Beacons

There are convincing applications for Bluetooth beacons in markets including manufacturing, facilities management, mining/construction, and vehicle/equipment maintenance that don’t require a critical mass of either users or locations.

¹ http://www.internetretailer.com/2015/04/09/75-store-shoppers-use-their-mobile-devices-store
² http://www.mobilecommercedaily.com/brands-at-risk-for-placing-more-value-on-apps-than-mobile-web-sites-report
For instance, there are large dump trucks used in mining that cost millions of dollars each. Bluetooth beacons are used to track their movements at work sites to ensure that they are used efficiently. If a dump truck travels beyond a virtual fence (geofence), an alarm is triggered. The combination of a Bluetooth beacon in the truck and an online reporting system can be used in place of the traditional clipboard and handwritten notes. At the end of each shift, the operator reports the truck’s status, including fuel level. If something needs to be repaired, a picture or video of the problem can be added to the vehicle’s online record.

In some markets, Bluetooth beacons can serve enterprise and consumer applications, reaping economies of scope. For example, a metropolitan bus system can use one set of beacons for vehicle maintenance and another set of beacons to provide passengers with directions, schedules, and real-time service alerts.

Enterprises are often willing to be early adopters, to pay more money, and to ride steep learning curves because the benefits to them are compensatory. It’s not surprising that Bluetooth beacons are already doing well in markets such as mining. The number of beacons used in manufacturing and equipment/vehicle maintenance could easily dwarf the number of beacons used in retail shopper engagement.

3. Wildcard Opportunity: Bluetooth Beacons for Managing Your Life

There is another opportunity for Bluetooth beacons that doesn’t require a critical mass of users. Bluetooth beacons can be used by individuals for home, office, and automobile automation, and to keep track of people, pets, and things.

Bluetooth beacon stickers are used to help locate items that are frequently misplaced such as key rings, mobile phones, and TV remotes. This application could grow the market one user at a time. A smartphone app can quickly determine whether a key ring equipped with a Bluetooth beacon is currently within range. If not, the app can indicate where the key ring was last seen.

There are other potential applications for personal Bluetooth beacons. Companies that provide home automation products and services could use beacons to trigger specific actions
when the user enters the home or a specific room. Beacons with integrated sensors could indicate whether a window or door has been opened or closed. Consumers will eventually invent their own uses.

4. The Bigger Picture: Indoor Positioning and the Physical Web

Should augmented reality be confined to the laboratory or does it offer practical solutions? Suddenly, the combination of Bluetooth beacons, smart devices, and the Web presents an eminently practical, affordable, and useful way to “augment” the physical world.

For instance, local governments can deploy Bluetooth beacons to assist visitors. Beacons can tell them where they are, what’s nearby, and how to get to specific destinations. This may include displaying maps and suggesting routes. Bluetooth beacons can provide information about an historic location, a neighborhood, or an entertainment district. Local businesses can use Bluetooth beacons to tell passersby about themselves and even present offers to lure them inside.

Bluetooth beacons can add content to any place or object—whether indoors or outdoors. While Apple’s iBeacon is designed to enable enterprises—particularly retail stores—to engage mobile users, Google’s UriBeacon was conceived to play the more generic role of tagging things (particularly machines) with Web pages or other resources. Developers have only recently got their hands on UriBeacons, so it’s too early to say whether they will be more or less successful than iBeacons. But they are positioned to serve different needs. UriBeacons have the advantage of being visible to anyone using a “physical Web” browser. Google plans to add physical Web support to its popular Chrome browser, as well as lobby other browser makers to do the same.

There are many potential applications for UriBeacons, and deploying them should be easy. But it will be some time before there is a large base of users with physical Web-capable browsers.
Table 1: Apple iBeacon versus Google UriBeacon

<table>
<thead>
<tr>
<th></th>
<th>iBeacon</th>
<th>UriBeacon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading proponent</td>
<td>Apple</td>
<td>Google</td>
</tr>
<tr>
<td>Broadcast content</td>
<td>Universally unique identifier, major number, minor number</td>
<td>URL or other resource such as book ISBN</td>
</tr>
<tr>
<td>Device software</td>
<td>Native app designed to interact with specific UUIDs</td>
<td>Physical Web-capable browsers—no app required</td>
</tr>
<tr>
<td>Communication model</td>
<td>Push</td>
<td>Pull</td>
</tr>
<tr>
<td>User action</td>
<td>Receives notifications</td>
<td>Selects and interacts with nearby beacons</td>
</tr>
<tr>
<td>Tracking</td>
<td>Triggers event when user moves within range</td>
<td>Only “sees” users who select that specific beacon</td>
</tr>
<tr>
<td>Major applications</td>
<td>Shopper engagement, clipboard replacement (access/update info)</td>
<td>Interact with objects such as vending machines and parking meters</td>
</tr>
<tr>
<td>Status</td>
<td>Moving from field tests to deployments</td>
<td>Developers preparing for field tests, waiting for Chrome support</td>
</tr>
</tbody>
</table>

5. Business Opportunities

Bluetooth beacons present a constellation of new business opportunities. The most obvious include the manufacture and sale of beacon hardware, the development of beacon-aware apps, and cloud-based beacon management services. There are also opportunities for integrating Bluetooth beacons with other hardware and systems, creating networks of beacons, and using beacons to advertise other products and services.

If the market for Bluetooth beacons takes off, then beacons will quickly become commodities. Most beacon suppliers—many of them startups—have concluded that the real opportunities are in cloud-based services. These companies are motivated to sell beacons at or under cost in order to generate recurring service revenue for creating and managing proximity marketing campaigns.