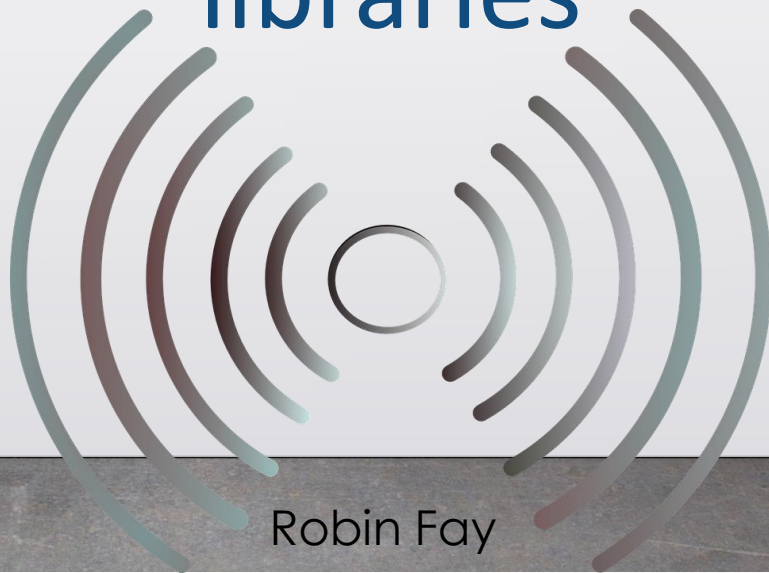




Beacons: Bringing new services to libraries



Robin Fay

NFC, QR Codes, and BlueTooth

- **Near-field communication (NFC)** is a set of [communication protocols](#) that enable two electronic devices, one of which is usually a portable device such as a [smartphone](#), to establish [communication](#) by bringing them within 4 cm (1.57 in) of each other.^[1]
- Device to Device
- Close (nearly touching)
- Exchange data



NFC, QR Codes, and BlueTooth

Bluetooth

- wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves from fixed and mobile devices)
- Used to build personal area networks (PANs).
- It can connect several devices

- [Wikipedia](#)

BLE = Bluetooth Low Energy – over 1/2 a billion phones have this technology

Bluetooth

Is a specification which is used to create chipsets which are then embedded into devices, like a beacons



Bluetooth or RFID – what's the difference?

Radio-frequency Identification (RFID)

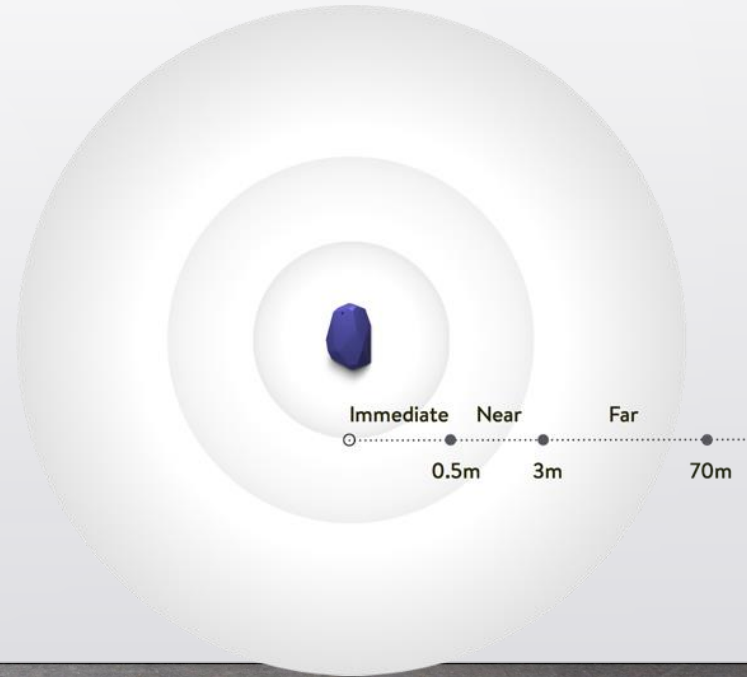
- used for **a system that communicates using radio waves between a reader and an electronic tag attached to an object**. A RFID system comprises of readers, tags and RFID software.

Bluetooth

- **is a technology used to transfer data in a short range.**
- Creates a personal area network (PANs). Bluetooth could be used to create short range wireless connections between a large range of devices. More accurate than GPS because it is based on proximity not location.

Bluetooth LE and Location Services

- required to “listen” for beacon broadcasts, and tell whether or not you’ve entered or existing a particular broadcast region. Apps that require this will typically notify the user if they do not have Bluetooth turned on. This is referred to as Beacon Monitoring.
- Location Services is required to determine proximity to beacons. This is referred to as Beacon Ranging. It typically falls into 3 categories: Immediate, Near, Far.
- iBeacon interaction uses Bluetooth Low Energy. Unlike a Bluetooth headset with requires a constant connection and thus more battery life, BLE uses short timed bursts for communication



Beacons

- Beacons are small bluetooth broadcasters that you can attach to any location or object. They broadcast tiny radio signals to your smartphone app.
- The app uses the signals to understand their proximity to the beacon.



Beacons, a.k.a. Bluetooth Low Energy (BLE) and Bluetooth Smart: What do they look like?



Estimote



Accent Advanced Systems



AIRCable



BlueSense Networks



Plus Location Systems; Bluecats

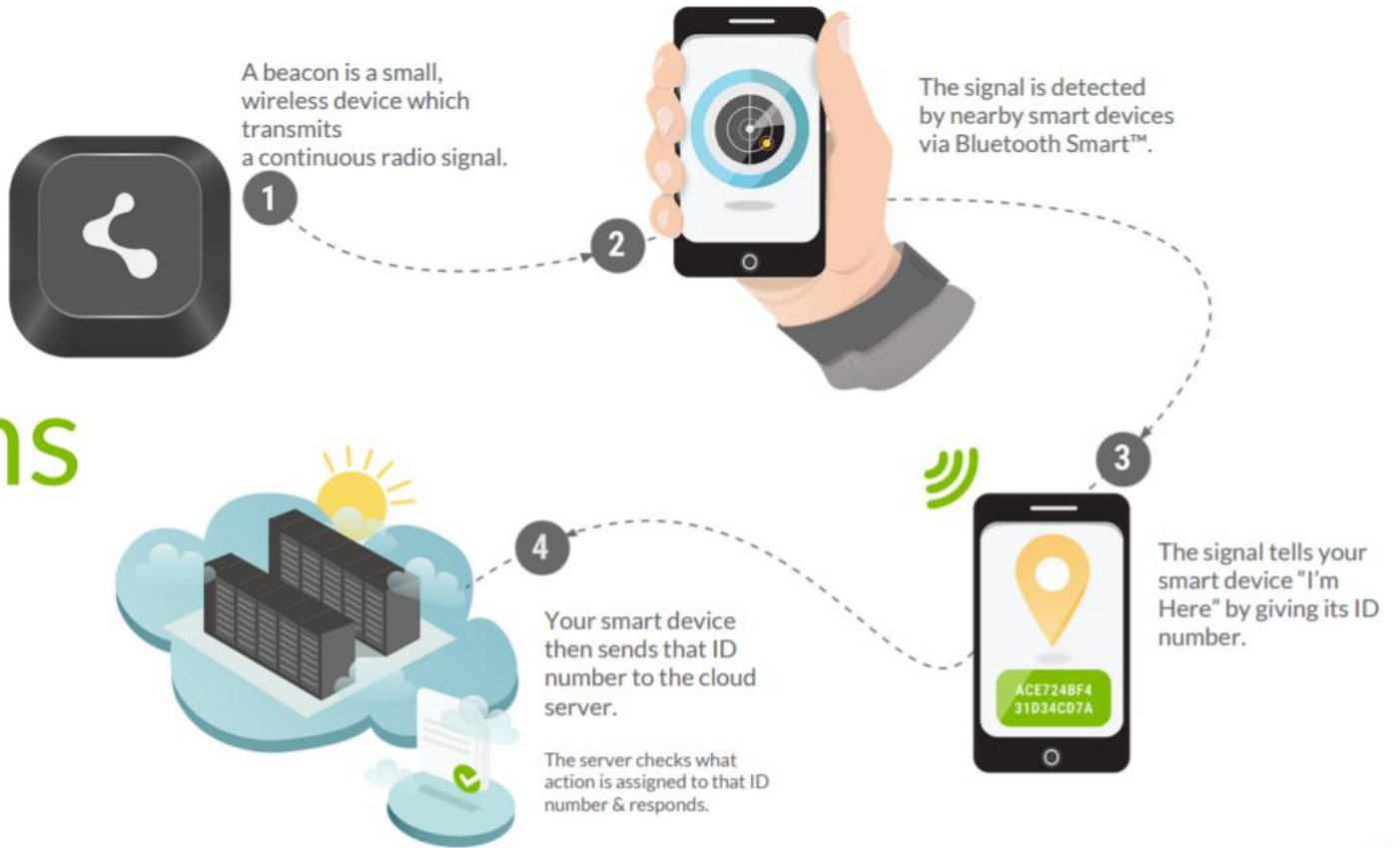
Raspberry Pi can be used as a beacon [piBeacon from Adafruit](#)

Beacons

- “Push” content based on physical location
- iBeacon is a protocol developed by Apple (2013)



How beacons work

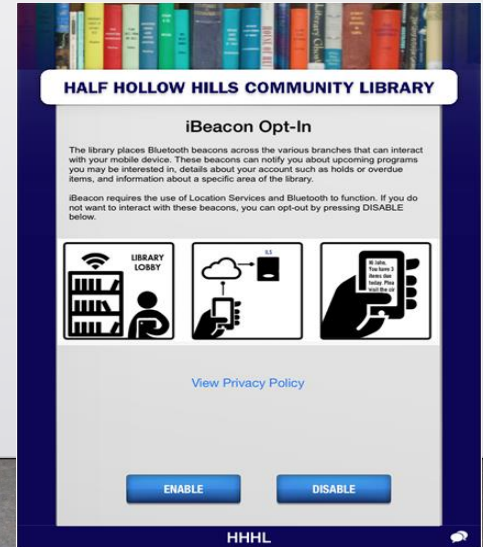


<https://www.youtube.com/watch?v=SrsHBjzt2E8>



Beacons

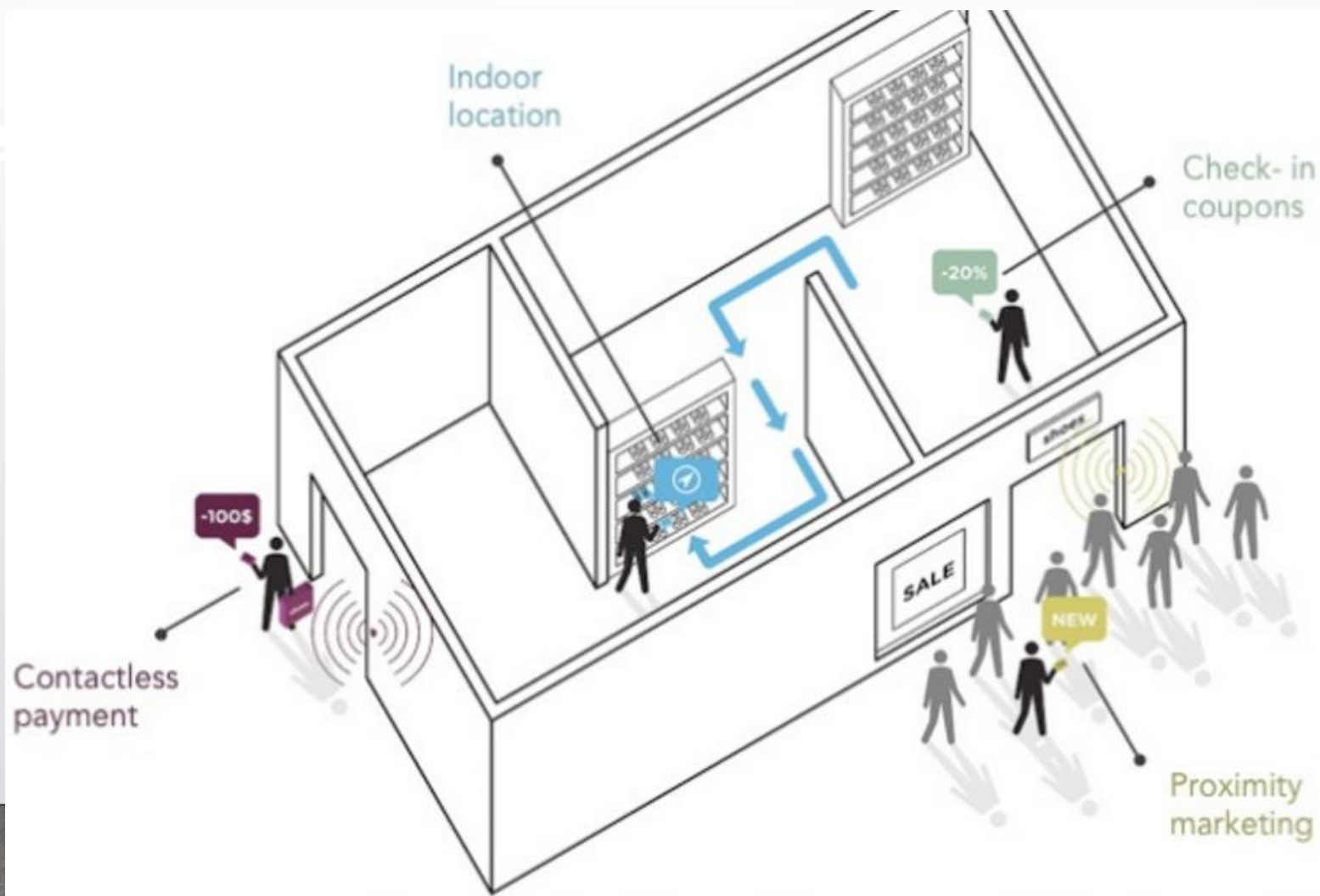
- A Beacon itself can't track people because it is unable to receive information - it just broadcasts.
- However, the signal is received by an app or software which does gather data (opt in)



Other Beacon Capabilities

- Temperature - Can tell the ambient temperature of where the beacon is located.
- Accelerometer - Can tell if the beacon is in motion, or stationary
- Haven't thought of any real world ideas for these yet.

Be



Beacons in libraries

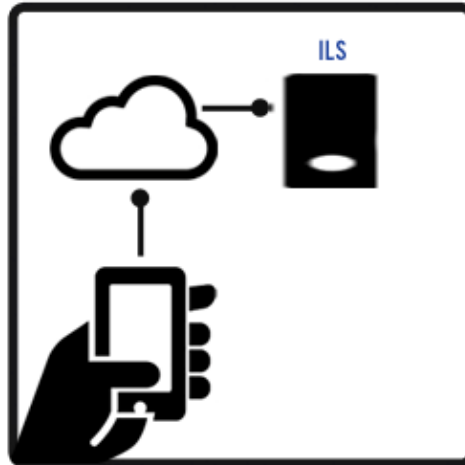
1

A patron enters the library.
Their device picks up a beacon broadcast.



2

Their device reaches out to
the library ILS to check account
information.



3

A response is received, instantly
notifying the patron about items
due, holds ready, or more.



Idea list

- direct patrons to special displays or collections
- alert them to programs happening that day or registration links for upcoming programs
- link them to contextual bibliographies
- send a survey
- use the location stats to find out foot traffic patterns and redesign things accordingly
- monitor occupancy to see where seating or a quiet place is needed

Estimote: Hardware

- iBeacon developer kits approximately 100\$; Used by large retailers like Target

inMarket: Platform for Retailers, Brands, and Apps

Capira specifically developed for libraries

Gimbal: Proximity Solutions

Kontakt.io: White-Label Solutions

Swirl: In-Store Marketing Platform

Sonic Notify: Enterprise Proximity Solution

indoo.rs: Indoor Positioning and Navigation

Mobiquity: Beacon Network

Challenges

- Windows phones are not supported and Android may be uncertain (though generally 80% of phones on the market are compatible).
- May need to consult with legal team, especially when dealing with patron data.
- Privacy may be a concern

Case study

Fayetteville Free Library (FFL) in New York recently began experimenting with five BluuBeam devices, four of which will be used to duplicate event notifications and other news on area-specific digital signage. The fifth unit will be positioned to send notifications to people outside the library.

BluuBeam can send messages regarding upcoming computer training courses

Case study

“For instance, in the café, daily specials; in the children’s area, what’s happening there that day; in the Fab Lab, things that have been made,” said FFL Executive Director Sue Considine.

“We felt like every flyer that we produce, every message that we put up on digital signage, should also be available without a mediator necessary, through BluuBeam, to people who come through the door.”

Patrons can then easily save information that they are interested in, or forward a message to a friend.

Reading Recommendations with Beacons

The image displays three sequential screenshots of the Somerset County Library System app, illustrating the process of enabling reading recommendations.

Screen 1: WELCOME

- Find**: Find books, movies, music...
- My Account**: View my record, Digital Library Card, notifications, and more
- About Us**: General information and directions
- Services**: Download eBooks, magazines, audiobooks...
- What's Happening**: Search for Programs & Events
- New**: Newest Adult, Teen and Children's items
- Reading Recommendations**: Receive and check personalized reading recommendations
- Self Checkout**: Take out books and other library materials

Screen 2: OPT-IN

Novelist is a service provided by the library which offers patrons recommendations for reading materials based on your preferences. Additionally, you may opt in to receive reading recommendations tailored specifically to what you enjoy reading.

Features:

- View a list of new reading recommendations tailored specifically to your tastes
- Easily place holds on new reading recommendations at the library through this app
- View books that are recommended the most to other patrons in the library
- Receive Push Notifications when new recommendations are available for you

In order to provide you with personalized reading recommendations, the library will need to monitor and share items you check out with third parties. Under no circumstances will your information be shared with unauthorized third parties or used for marketing/advertising purposes.

I wish to receive personalized reading recommendations from Novelist and grant permission to the library to share my checkout history.

TURN-ON

Novelist
Empowering Librarians... Engaging Readers

Screen 3: READING RECOMMENDATIONS

- My Recommendations**: View a list of your most recent book recommendations from Novelist
- Popular**: See books that are recommended the most to library patrons
- Rate My Checkouts**: Rate books you have checked out previously for more accurate recommendations
- Disable Service**: Disable personalized recommendations and remove your data from the system

Novelist
Empowering Librarians... Engaging Readers

Capira

-Circulation Notices – Patrons who have authenticated their account information in your library app can receive notifications about items due that day, items ready for pickup, and much more when they enter the building. Library staff know that patrons often visit the library and forget they have items due that day.

Automatically reminding them to stop by the circulation desk and renew them before they leave is a great customer service.

-Event Notices – A patron can walk into your library's teen section or a specific branch building and get information about events happening that day for that location. Libraries can customize these notices, perhaps it should display a list of upcoming events for that section, or just remind patrons of events upcoming in the next hour or two.

-Informational Notices – Does your library have a special room or section for local history, business, or another specialty? Patron devices can launch an informational notice about that area and items found within if their devices finds the beacon located nearby.

-Shelving Notices – A patron can put his device near a particular shelf and see a list of items located in that section. For example, if a library offered a row of shelves with New Releases, a patron could view items released that day using their device and a beacon located on the shelf.

-Patron Assistance – Devices can time how long a beacon stays in range. Staff can be notified if a patron spends an excessive amount of time in a specific area or room without moving, possibly indicating they may require assistance looking for items.

-Beacon Tracking – Anonymous beacon tracking allows libraries to capture how patrons with your library app move throughout the building, along with time spent in each area.

Uses

Deliver educational content –
popup lessons, contextual
help, bite size learning, just in
time...

Deliver materials and
resources

Book reviews?

BI ? Real time, interactive, on
the spot?



Deliver information
throughout a building
and beyond

Maps, directional signs,
much more

Replace printouts and
handouts

2

Combine beacons with
apps for wayfinding
and campus tours.
Printed maps are
becoming a thing of
the past.



1

A patron enters the library.
Their device picks up a beacon broadcast.



2

Their device reaches out to
the library app server to see
events occurring at the library.



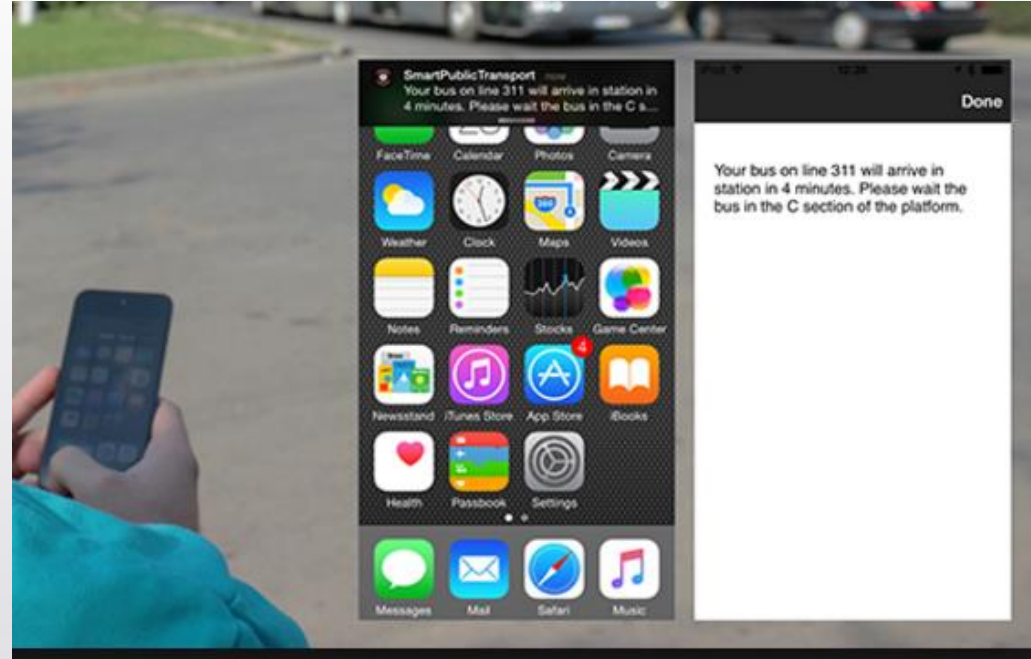
3

The patron is notified about an
upcoming event they may be
interested in signing up for.



Engage patrons in a new a way

- Rating systems
- Giveaways/raffles
- Scavenger hunts
- Notifications – wait times in lines, parking availability, bus is nearby & how long until it's there



Eliminate barriers and increase user experience

- Class attendance
- Automatic check-outs?
- Access / secure area access – eliminate locks/doors
- Security – track equipment in the building
- Track building use – flow of traffic
- Circulation gate counts?



Questions?

