Implementing Product Tracking using Beacons

Sanjit Singh[1], Johan Palkar[2]

[1,2]Student, Dept. of Electronics and Communication Engg., Thakur college of Engg. and Tech., Mumbai, India

Abstract: Beacons are tiny and inexpensive, micro-location-based technology devices that can send radio frequency signals and notify nearby Bluetooth devices of their presence and transmit information. Smart phones or other mobile devices can capture the beacon signals and distance can be estimated by measuring received signal strength (RSSI). The closer the receptive devices the stronger will be the signals. Powered by coin batteries, they have a powerful ARM processor, memory, Bluetooth Smart module, and temperature and motion sensors. Apart from small standalone beacon devices, PCs, mobile phones and tablets with BLE support can all function as beacons, with the ability to both send and receive beacon signals. Various industrial sectors including retail, transit systems, enterprises, educational institutions, event organizing, finance, travel etc. have started leveraging beacons solutions to track and communicate with their potential and existing customers. A beacon fixed on to a shop wall or event location or any public place, can communicate easily with a corresponding Smartphone app and figure out where the person is located currently, with great accuracy. The retailers or event organizations can then come up with a much targeted or personalized communication based on the proximity of the customer.

Keywords: wireless devices, Bluetooth system, NFC

1. Introduction

It is observed that retail industry is increasing exponentially where in sellers or the retailers try every new possible gimmick to attract customers. If you run a retail business, then utilizing beacon hardware can greatly help in attracting the attention of your customers, as it can serve your advertising messages straight to the user as soon as the user's device comes within a beacon's proximity within your store. These personal, tailored messages can not only assist in increasing up sell, but also serve as a medium to enhance the customer experience. In addition, beacons and loyalty apps can be used together to reward customers for a myriad of location-based actions.

2. Scope of the project

The focus on personalization in commerce has already demonstrated notable value and with beacon technology, personalization is essentially intrinsic. Everything ranging from coupons to product recommendations via beacons warrants personalization and if done right, can be extremely invaluable for your brand name and customer loyalty. Just as shopping applications such as ASOS can send personal shopping recommendations based on previous purchases, so too can beacons, yet with even more efficacy because the consumer can

see and hold those recommendations in person. Moreover, if a store is particularly crowded with all salesmen occupied, consumers can still have a personalized, assisted experience by way of the beacons.
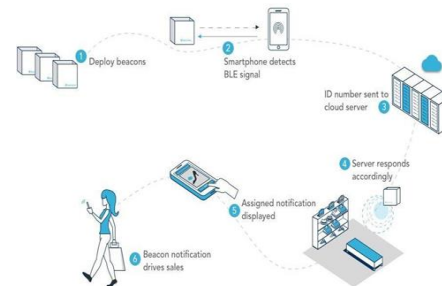
3. Proposed design

Fig. 1. Proposed design

We propose a system where we would use mobile Bluetooth to share its ID to the Beacon placed in its vicinity. Mobile operating systems including We propose a system where we would use mobile Bluetooth to share its ID to the Beacon placed in its vicinity. Mobile operating systems including iOS, Android, Windows Phone and BlackBerry, as well as mac OS, Linux, Windows 8 and Windows 10, natively support Bluetooth Low Energy.

Using this Bluetooth low energy, we would transmit some data through the broadcasting signals & at the receiving end the users would get flash notification about the signali OS, Android, Windows Phone and BlackBerry, as well as mac OS, Linux, Windows 8 and Windows 10, natively support Bluetooth Low Energy. Using this Bluetooth low energy, we would transmit some data through the broadcasting signals & at the receiving end the users would get flash notification about the signal. Beacons are small computers, roughly the size of a standard Wi-Fi router. Under the silicone casing, there is small ARM computer, combined with a Bluetooth Smart connectivity module, powered by a battery.

As part of indoor positioning systems, beacons use proximity technology to detect human presence nearby and trigger pre-set actions to deliver informational, contextual, and personalized experiences.

When a user walks past an area where an indoor positioning system is set up, a beacon sends a code with a message to their mobile device. Here app solutions come forth: this coded message, which is shown in a form of a notification, can only

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121

be viewed with a mobile app (third party or brand mobile app). Users receive coded messages from beacons via Bluetooth Low Energy (BLE) — a power- efficient Bluetooth technology developed for Internet of Things applications and devices. Moreover, an app doesn't even have to be running to be awakened by the beacon signal.

4. Problem Definition

Some of Problems faced by Retail shops are during big sales & rush crowds, the salesmen cannot focus on all the customers. Hence they might miss on customer opportunity & credibility. In School & colleges the initial time period is wasted by taking physical attendance. Hence we propose to implement a system which will save time in classrooms, which will automatically mark attendance of students/people present in the classroom. Also help the retailers to showcase their product features & advertisement through such a technology with ease.

5. Problem solution

Using this Bluetooth low energy, we would transmit some data through the broadcasting signals & at the receiving end the users would get flash notification about the signal.

6. Conclusion

This paper presented an overview on product tracking using beacons.

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