

➤ Hyper-local
Commerce via
BLE



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▶ Steady, systemic penetration of hyper-local commerce

Commerce in today's world is steadily approaching universal commerce, shifting away from the limitations of traditional brick-and-mortar outlets and into a more holistic customer experience that integrates online, mobile, and physical shopping. With mobile devices at the center of universal commerce, merchants are making increasing efforts to drive their presence on multiple channels and deliver greater service and capability exposure to their businesses.

One key area in which development has been both steady and consistently high is location-based commerce.

Most people, globally, who use apps like Foursquare, want to be able to use discovery-based services to identify cafes, restaurants, and so on. Despite the uses to which consumers are putting the technology, the potential of location-based commerce is significantly greater.

For a merchant, the ability to identify a consumer's location and deliver timely, relevant information, coupons, discounts, advertising, and marketing messages is a powerful, compelling proposition that, if handled correctly, can bring significant benefits to consumer and merchant alike.

Multiple competing technologies

A lot of different technologies have emerged to enable hyper-local commerce—ranging from older ones such as cell-tower triangulation and GPS to more popular ones like NFC, WiFi Direct, and BLE.

Although no single technology has witnessed mass adoption thus far, BLE has shown considerable promise in being able to rise above those aspiring to be the poster boy for location-based commerce. BLE's surge in popularity stems from the fact that it has been put into action by various players, the most prominent of which are Apple with iBeacon and PayPal, which offers PayPal Beacon.

A growing number of retailers are experimenting with beacons, including New York-based drugstore chain Duane Reade, US apparel chain American Eagle,

Belgian supermarket chain Cora, and British supermarket chain Tesco, supermarket giant Carrefour and convenience store group Nisa.

Several interesting demos and trials have been conducted which show how BLE technology can be used to dramatically improve the customer experience and drive the adoption of the technology.

iBeacon: The Citi Field demo

A demo of iBeacon technology was set up at the Citi Field, a baseball stadium in the United States, in September 2013. The app detects when consumers reach the stadium. The app automatically populates a stadium-specific ballpark guide, so the content changes dynamically based on the consumer's location. For tickets purchased online, the barcode is automatically displayed when the consumer nears the ticketing and entry areas.

Once inside the stadium, more location-tailored content is unlocked. For the demo, a video about the history of the stadium was played when standing near an iconic statue. The app has the capacity to unlock additional content when the consumer is at specific points of interest.

The app itself offered a number of remarkable features, such as giving users directions to their seats, automatically checking them in on Facebook, sending notifications about special deals, and pushing coupons and discount offers upon entering certain stores in the stadium.

Following the success of the demo, Major League Baseball opted to install iBeacon in 20 stadiums, with the intention of providing users with customized, unique, differentiated experiences each time they go to a baseball game.

While a commercial deployment of iBeacon is still in the works, the success of the initial pilot at Citi Field is evident from the progression to Phase 2 of testing.

Shopkick: The Macy's trials

Shopkick is a shopping app that allows consumers to flag items that they want, after which consumers receive in-store alerts which direct them to offers on those specific products and other related ones.

Using a customized BLE transmitter called ShopBeacon, Shopkick launched trials in November 2013. The closed beta was run in two Macy's

stores—Union Square, San Francisco and Herald Square, NYC—and worked on both iPhone and Android devices.

The beacons allowed offers to be pushed to consumers when they were walking past certain areas of the store or past departments in which they had previously displayed interest. For those who opted for a certain feature, an alert could also automatically launch the app and trigger other actions—such as notifying users about the loyalty points available for redemption against a purchase.

Although this was not the first commercial iBeacon deployment, it was the first major retail deployment. While Shopkick for retailers has yet to witness a commercial release, the pilot was reported to have been a resounding success. The CMO of Macy's was quoted as saying that over half the Shopkick users visited Macy's because they use the app.

After the trials, Shopkick planned to release and implement the technology in other retail brands as well, among which were American Eagle Outfitters, Best Buy, Crate and Barrel, JCPenney, Macy's, Old Navy, The Sports Authority and Target.

Clearly, BLE is catching on—but what contributed to the rise of this technology?

▶ The rise of BLE

BLE first entered the spotlight in the context of m-payments when Microsoft announced that it was experimenting with a combination of BLE and facial recognition technology to create a zero-effort payment system. Like Microsoft, many initial proponents touted BLE as being a viable replacement for NFC—but more recent developments have moved away from that line of thought.

Instead, BLE is being seen as another step along the road to frictionless interactions between merchants and consumers. Given that BLE is already integrated with most major smartphones and offers a low power method of wireless communication, it stands poised to evolve the shopping experience even further.

What is BLE?

Bluetooth Low Energy, or Bluetooth LE, or BLE, is designed to maintain a similar communication range as traditional or 'classic' Bluetooth, while using considerably less power. Originally introduced by Nokia in 2006 and named 'Wibree', BLE was merged with the Bluetooth standard in 2010, after version 4.0 of the Bluetooth Core Specification was adopted.

BLE vs. Classic Bluetooth

| BLE | Classic Bluetooth |
|---|---|
| Classic Bluetooth Focuses on wireless data transfer with ultra-low power consumption | Focuses on continuous, wireless streaming of data at relatively high speeds |
| Shorter standby times (increased sleep times) | Longer standby times (in comparison to BLE) |
| Quick connections (setup and release) | Longer connections (in comparison to BLE) |
| Low peak power when transmitting data | Higher peak power when transmitting data (in comparison to BLE) |
| Lower data transfer rates (due to lower power consumption) | Higher data transfer rates (due to higher power consumption) |
| Not intended for audio streaming; cannot stream video | Can be used to stream both audio and video |
| Up to 20 simultaneous connections (supports more connections due to small data packages and quick connection setup) | Up to 7 simultaneous connections |
| Same pairing mode as classic Bluetooth; content is pushed to a device but can only be downloaded with consumer permission | Content is pushed to a device but can only be downloaded with consumer permission |
| 128-bit AES cryptography | 56 to 128-bit encryption |

Marketed under the name 'Bluetooth Smart', BLE is meant to find unique and previously unheard of applications in industries such as healthcare, fitness, security, and home entertainment. Devices that can take advantage of the low power requirements of BLE include those that are powered by coin-sized batteries, such as watches and toys. Other potential devices include human interface devices, keyboards, mice, and other entertainment devices.

Market penetration

According to a report published by ABI Research, titled, BLE Tags and the Location of Things, BLE beacon shipments in the next 5 years could create a 60 million unit market by 2019.¹ The Bluetooth Special Interest Group (SIG) has predicted that over 90% of Bluetooth-enabled smartphones will support BLE by 2018.² Yet, the potential of BLE extends to significantly more than just smartphones.

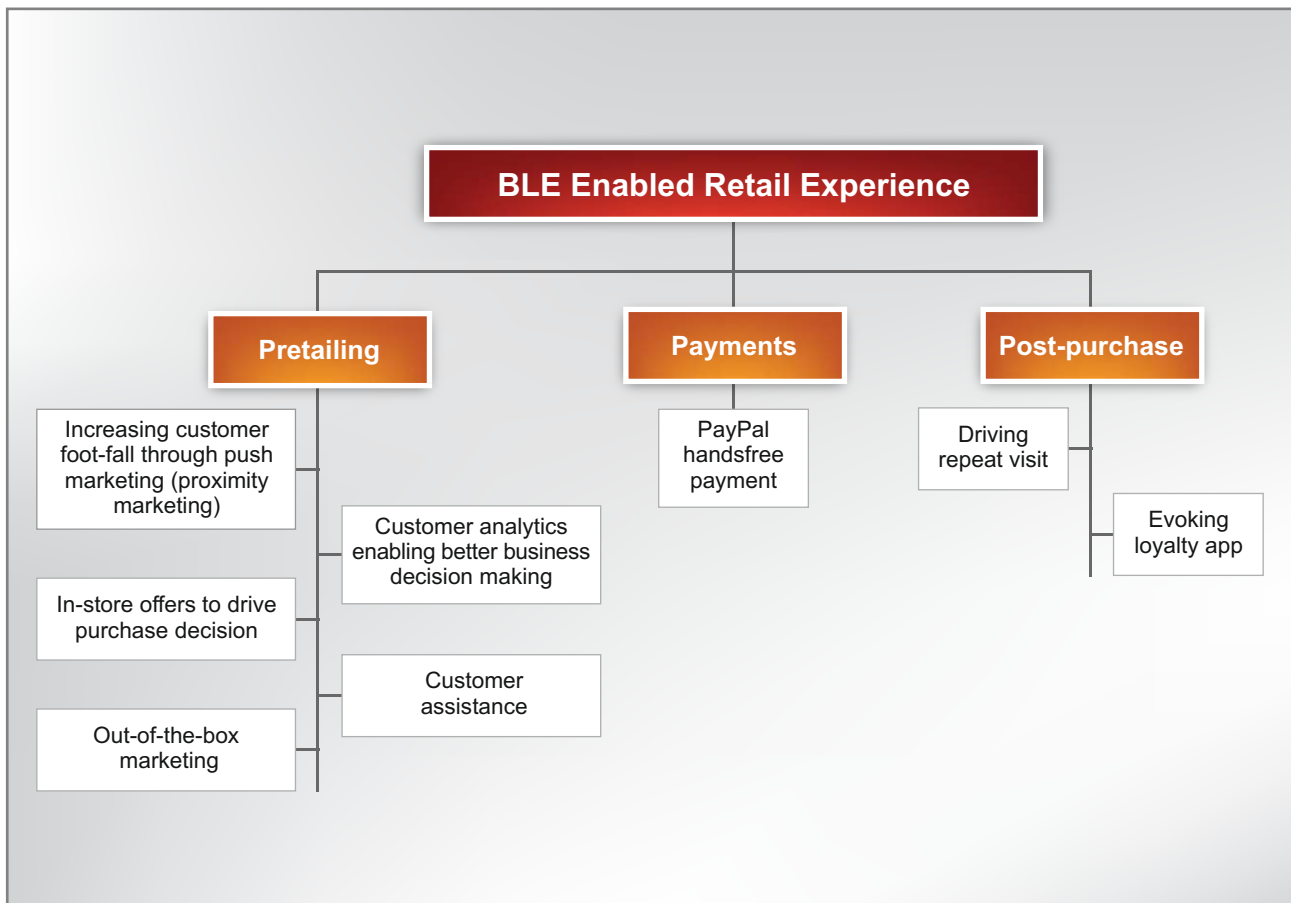
While the initial surge of interest was oriented towards more consumer communication, the low power consumption makes it ideal for wearable technologies—medical devices such as heart-rate

monitors and wristbands; smart watches and fitness bands that monitor health during exercise; smart glasses such as Google Glass; and much more.

Yet, till date, the greatest penetration of BLE has been in how it has changed the retail experience, for both the consumer and the merchant.

▶ BLE enabled retail experience

A key focus of retailers has always been how they can bring more traffic into their physical stores and convert visitors into purchasers. More recently, attention has also been directed towards simplifying the payment process and offering consumers a more engaging, immersive shopping experience—all with the ultimate goal of driving revenue. BLE, in keeping with these needs, stands poised to transform the shopping lifecycle: from pretailing, to payments, and post-payments.



¹<https://www.abiresearch.com/press/ibeaconble-beacon-shipments-to-break-60-million-by>

²<http://circuitcellar.com/tech-the-future/bluetooth-low-energy-changes-the-wireless-landscape/>

Pretailing

BLE presents a strong business case with allowing merchants to engage with consumers at the right time. By pushing information to them at specific areas of a store, BLE can be used to influence purchase decisions, by allowing consumers to make more effective, more informed decisions. BLE can be used by retailers to provide welcome messages, product information, advertisements, offers and coupons when consumers approach or enter the store.

► Use case: Increasing customer foot-fall through push marketing (proximity marketing)

Stores in malls face especially high competition. Implementing BLE in mall stores can allow merchants to increase the number of visitors—and potentially increase the visitor-to-purchaser conversion ratio.

When a consumer passes a store equipped with BLE Beacons, notifications can be sent to greet the consumer; provide alerts about sales; offer information about new items, stock, or specific products. By creating attractions outside of the store, BLE can result in more people actually visiting the store.

► Use case: Customer analytics enabling better business decision making

BLE beacons attached to shopping carts and baskets can be used to track a shopper's journey around a store and unlock customer data through the analysis of shopping patterns.

With the beacons working in conjunction with Bluetooth sensors attached to the ceiling of the store, location data can be fed to cloud-based servers for analysis. Data gathered for insights can include movement of shoppers through stores, time spent in the store, and time spent on a particular aisle.

By identifying patterns in the data, merchants can focus on what seems to attract customers to determine supply, items that are not being sold quickly enough and might move faster with offers or discounts, and re-evaluate the layout and placement of merchandise to help customers make better decisions.

This model is already being evaluated by the supermarket giant Carrefour and presents the added advantage of requiring no customer effort at all—all data is collected anonymously!

► Use case: In-store offers to drive purchase decision

BLE's transmission range and ability to automatically check-in shoppers allows merchants to leverage customer data to push offers and discounts. Providing customers with offers enables merchants to do more than just drive traffic into the store—merchants can also direct the flow of shoppers within the store itself.

In large, multi-brand stores, for example, merchants can promote a particular brand via a beacon at the display area, which pushes offers to customers when they're close enough to the display. In multi-product stores, multiple beacons can deliver a contextual experience—offering shoppers discounts or offers on clothes, cosmetics, footwear, and more.

For example, in a multi-product, multi-brand store, individual beacons can be placed at sections for shirts, trousers, jeans, cosmetics, footwear, crockery, and electronics. Each beacon can push messages to customers with information on discounts, offers, and purchase rewards. Localized messaging in the store can help draw attention to different items on offer without the need for elaborate displays, and help customers enrich their shopping experience by exploring the store more thoroughly.

Beacons can even be placed near payment counters, offering checkout offers and discounts, such as freebies based on the total billing value. The same checkout offers can also be used to drive higher sales, subtly prompting consumers to generate larger bills with offers of larger discounts or better freebies.

For example, a beacon at a payment counter can push messages to customers about rewards on a bill of \$100 or more. Customers with lower totals that are close to the \$100-mark are likely to purchase a few additional items to increase their total—effectively driving higher sales in the store.

BLE's ability to provide location-based communication can make marketing communication and shopping experience significantly more contextual.

► Use case: Customer assistance

Beacons can be used to recognize customers present in the store using their mobile devices. Customer information can be passed to the store assistant's tab or Google glass using Wi-Fi or an internet connection. Customer assistants can then look customers up via either Google Glass or any other mobile device that the store may be using, get more information about them from their previous interactions with the store—and, thus, serve them better.

► Use case: Out-of-the-box marketing

To counter the threat of increasing competition, merchants are increasingly looking towards identifying and trying out unique methods of customer engagement. BLE is a technology that can be used to create innovative customer engagement programs, and make sponsorships and charity programs more engaging.

For example, in April 2014, jeweler Faberge organized a massive Easter egg hunt in New York City to support the brand's charitable efforts. Faberge commissioned 275 huge egg sculptures and scattered them around the city. An online map guided hunters in the right direction and proximity-based Beacon interactions rewarded participants as they virtually bagged the eggs.

Payments

Although BLE has witnessed growth in marketing and customer engagement, its applications in the contactless payments space are still under speculation.

The primary concern is around security. With BLE's longer range, it is potentially easier to spy on and interfere with data transmitted using BLE, as compared to short range transmissions that are achieved via NFC.

Another potential concern is infrastructure. To actually drive the BLE payments market forward, merchants will need BLE-enabled POS machines which are certified by the existing payment network, which will require significant effort to achieve.

Finally, checkout time is also a potential concern, since the longer range of BLE will result in cashiers being presented with multiple devices and shopper credentials at the time of checkout. The cashier will need to select the correct device and process payments,

which could potentially lead to delays if shopper volumes are high.

That has not stopped advances and experimentation with BLE as a payment mechanism, and the most popular example by far is PayPal's hands free payment system.

► Use case: PayPal hands free payment³

When a consumer comes within the range of a Beacon, the PayPal app on his Bluetooth-enabled smartphone connects to the Beacon and requests a token. The Beacon sends certain parameters, comprising Unique Identifiers & Cryptographic Keys. The phone verifies the information relayed by the Beacon, and checks the consumer in based on the preferences that he has set.

If the location and store are both new to the app, the consumer is prompted to check in. He is also presented with the option to check-in automatically in the future, if preferred. The app then encrypts some data, for the Beacon to forward on, uninterrupted, to the PayPal servers. The server decrypts the data and checks in the consumer.

As the consumer checks in, the merchant receives the consumer's details—primarily name and photo ID. At the time of billing, the merchant only needs to select the correct name and photo. The Merchant System makes a call to PayPal requesting money from the user ID, and the transaction occurs.

This, essentially, represents a cardless transaction, facilitated by facial recognition by the cashier and verbal confirmation from the customer in case he has opted for hands-free payment for this store.

Post-purchase

Merchant engagement with consumers needs to continue on from the payment stage. After the first transaction has been made, a key focus is—and should always be—how to ensure that the consumer returns.

► Use case: Driving repeat visit

Beacons at the collection counter, payment aisle, or exit can be used to push messages to consumers that will give them reasons to return. Among these are thank you messages, discount coupons that are redeemable on subsequent visits, information on expected stock, and updates on upcoming sales.

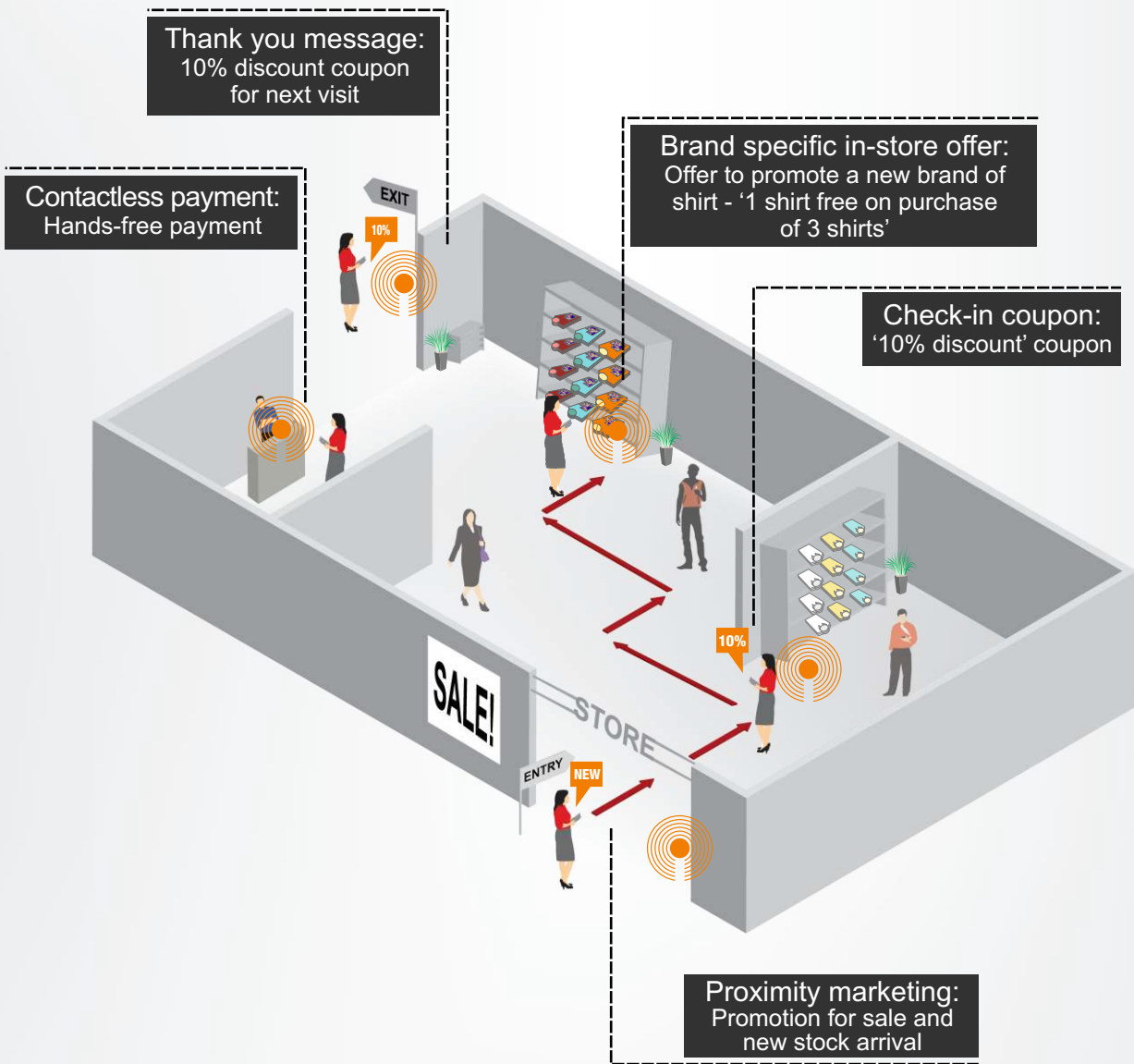
► **Use case: Evoking loyalty app**

Beacons can be used to evoke loyalty apps, remind customers about their point totals, provide updates about points added from their current purchases, and suggest rewards or discounts that can be redeemed using the existing point total.

► **Beyond retail: BLE powering new verticals**

Although retailers have been the first to adopt BLE technology, its potential applications are far beyond retailing. From restaurants and entertainment venues to airports and banking, there are a number of innovative ways in which BLE can be deployed to deliver value over and above what smartphone users have come to expect.

BLE enabled retail experience



Restaurants

Consider a family visiting their favorite restaurant. The father has the restaurant's app on his phone and, as he pulls into the parking lot, a beacon placed there pushes a welcome message. Using the app, he books a table for four and is added to the waiting list. By the time he actually enters the restaurant with his family, the concierge knows to expect them and is waiting to greet them.

When they enter the restaurant, a beacon at the entrance to the dining area pushes messages about the daily specials and the app opens up a menu for drinks, starters, and the main course. The father places his order for drinks for himself and his wife. A few minutes later, they order the rest of their meal.

During dinner, the father is sent a dessert coupon, which he accepts and uses to get his children ice cream. After their meal, he pays for their dinner through the app, using his mobile wallet.

It isn't just the larger restaurants that can benefit from BLE. Smaller ones, as well as kiosks in food courts and crowded markets, can use BLE to send coupons and draw traffic. Drive through and quick service restaurants, for example, can use BLE to prompt the app on customer's mobile device to open a menu and ask for pre-orders as a customer's car draws close to the counter. What does this mean?

For the consumer, it represents a remarkably hassle-free interaction—very little waiting, better service, and a more enjoyable experience. For the merchant, it represents a significant quality of service improvement, the chance to foster loyalty through more personalized attention, and a much greater opportunity to drive repeat business.

Entertainment and events

Now, think about a group of friends who decide to watch a movie. They go to the theatre and, as they draw near a ticket counter, a beacon pushes information to them about what's currently playing and offers links to trailers. The group picks a movie and pays for their own tickets using their mobile wallets.

When they enter a theatre's lounge, a beacon at the refreshment counter pushes a notification to them offering a group discount if they make purchases for 5 people or more. The app also pops up a menu, allowing them to place their orders using their

phones. This offers two advantages—besides the obvious discount, BLE also acts as a queue buster. They place their order without having to waste time waiting in a queue to do so. After they enter the theatre, their food is delivered straight to them, and they can use their mobile wallets to pay without having to leave their seats.

After they watch the movie, the app notifies them of upcoming releases and sends them another discount coupon as well as the chance to pre-book tickets, which some do.

Theatres represent just one application in the entertainment industry. Stadiums have already begun to deploy the technology as evidenced by the iBeacon trials. With similar use cases, BLE has vast potential to be used in stadiums during sports matches, exhibitions and museums.

Airports

As with restaurants and entertainment, the potential for BLE in airports is tremendous.

BLE can be used to deliver the right information at the right time to travelers. As travelers enter the airport, they can be sent notifications about boarding time, arrivals, and departures. They can also be sent a map with directions to baggage, check-in, security check, and customs.

After check-in, beacons in the airport can work in conjunction with airline's app to facilitate useful information such as the gate number, directions to reach the gate, indoor navigation, potential waiting time, in-flight menu, potential seating upgrades, and discounts on select shops at the airport.

Waiting time in particular can be made more interesting, by pushing notifications about interesting shops, offers such as 0% commission on money exchange, or discounts on shopping and meals.

Even luggage can be tagged with beacons. Travelers can be sent notifications when their luggage enters baggage claim after they arrive at their destination. Logistics teams can also use the information to track checked-in luggage, to make sure that everything is transferred from the start to the end point of the journey.

A number of airlines such as Virgin Atlantic, American Airlines and Easy jet are testing BLE technology in select airports in US and UK.

Banking

Although online and mobile banking is steadily gaining momentum, the role of branches in the banking ecosystem remains fundamentally significant. The advent of digital technology has made visits to physical branches tedious for customers. As a result, in keeping with banks' quest to improve both their digital presence, the efficiency of their branches, and offer a more engaging, convenient experience to their consumers, BLE stands poised to deliver impressive advantages in this area.

BLE allows banks to integrate the branch and digital channels in a way that only the internet alone cannot manage. With BLE, banks can do more than just be alerted to the arrival of consumers—registered consumers' transaction patterns can be quickly pulled up, along with interaction histories so that they can be served better.

Contextual notifications can be pushed to customers, informing them about new products, creating opportunities for upselling and cross-selling. When exiting the branch, customers can be prompted for feedback via simple forms, without having to go through automated, recorded feedback systems via phone calls.

Banks can also use BLE to track customer movements and time within a branch, to determine how much time customers spend there, how many customers are being served, and what the overall operational efficiency of the branch is. The data thus gathered can deliver insights that can enable branch optimization for better customer service, higher sales, and greater revenue.

These few examples only scratch the surface of all that is possible with BLE. Other industries, like medical and high-tech are slowly adopting BLE and finding ways to integrate the technology into their offerings. Over time, there is little doubt that we will see widespread adoption of BLE in ways that, today, we are yet unable to imagine.

▶ BLE and NFC: Complement instead of compete

BLE and NFC are perceived as competing technologies that are both locked in battle for mobile consumer engagement. In reality, however, both play a key role in defining how businesses and consumers engage with each other. While both are forms of wireless communication that are slowly becoming standard technologies on modern smartphones, they are different from each other in several fundamental ways.

Support on modern smartphones

NFC has a foundation of a relatively more mature technology, RFID, which dates back to the 1940s. BLE, on the other hand, is relatively more recent, with a technology foundation that dates back to 2006.

Despite the differences in lineage, both BLE and NFC technology are equally well-represented on modern smartphones—Android, Windows Phone 8, iOS and Blackberry.

The fundamental difference

BLE and NFC are two different radio technologies designed to serve different needs, hence, comparing them is difficult. However, few points have been enumerated that may help to create some differentiation between the two technologies. The most basic difference between BLE and NFC is in the way they receive and react to signals, and the range of signal coverage. Wireless BLE beacons transmit signals that BLE receivers listen for. These beacons continuously transmit discovery signals that can be received by BLE-enabled smartphones. BLE beacon transmitter strength also tends to vary, with the coverage radius measured in feet or meters.

NFC-enabled smartphones use NFC Tags. Unlike BLE beacons, which transmit continuously, NFC Tags only communicate when in close proximity to an NFC-enabled smartphone. NFC also has a much shorter range than BLE, with coverage radius measured in centimeters instead.

Balanced complementary technologies: BLE and NFC

Aside from the basic technological parallels, there are other areas as well, such as user experience, security, payments, product information, and location services, which BLE and NFC technology share a similar feature set, but do not directly infringe on each other's capabilities.

User experience

BLE beacons use a one-to-many approach, as a result of their continuous transmission mechanisms. When a smartphone is within range of a BLE beacon and has an active Bluetooth connection, it receives the beacon's discovery data and, based on the strength of the signal, determines the distance between the consumer and the beacon.

With NFC, however, close physical proximity to another NFC Tag is required for communication—the tags should be within 4 cm of each other. Embedded NFC tags in devices will typically execute a stored program when another NFC Tag is close enough, to transmit the required information.

Control over engagement and privacy

BLE and NFC are also different in how they allow consumers control over notifications and alerts. BLE offers continuous real time alerts based on proximity to a beacon. Consumers will receive the alerts provided their Bluetooth connections are active and can choose to take action based on the alerts.

NFC alerts are wholly consumer directed, because of the close physical proximity that is required between two tags. As a result, consumers completely control engagement with an NFC tag.

This particular difference between the two can also be equated to a difference in how consumer privacy is treated. BLE can potentially be viewed as more intrusive, due to continuous signal transmission that evokes the app. However, this argument is contested as consumers can disable BLE or decide not to download the app.

NFC, however, can be considered more private, because location data depends entirely on whether or not a consumer has interacted directly with a particular tag.

Location identification

BLE's continuous transmission allows smartphones to measure approximate distances from a beacon based on the strength of the signal received.

NFC readers, on the other hand, identify customer locations based on direct interaction with an NFC tag, acting as spot-location identifiers, rather than providing distances and range.

Security

BLE beacon signals are outbound—as a result, the signals themselves have no inherent security risks. The risks of BLE come from the apps that receive and use the signals.

Since NFC supports both secured and unsecured communications, there is a potential risk. However, it is of note that secure communications are designed to emulate contactless cards, such as credit cards and ID cards.

In a nutshell

The rise of BLE does not represent the end of the road for NFC. While both technologies are designed for proximity data transfer, both also have their pros and cons. BLE's longer range allows for connections across greater distances and greater ranges of data transmission. NFC's proximity requirements, however, have resulted in it being deemed more secure and less susceptible to interference.

BLE fits the bill as a technology that powers the transmission of information, such as offers, discounts, and greetings, to a large number of devices in a very efficient manner. It has emerged as a popular, powerful vehicle for proximity marketing and a great way to make pretailing more engaging for consumers.

NFC, on the other hand, with its multiple commercial tap-and-pay deployments and its advantages of simplicity, convenience, and security, is the clear winner in the payments space.

Both these technologies are already a reality. NFC-enabled POS infrastructures are already in place in multiple stores, all of which are compliant with and certified by existing payment networks. Although the technology for BLE is available and gaining momentum in markets across the globe, pilots and

trials are still being run to determine the best way to integrate BLE into the consumer experience—to fit smoothly alongside other technologies like QR codes.

Consider, for example, a consumer passing an apparel store in a mall. BLE pushes a notification through the store's app about a sale. When the consumer enters the store and moves to the 'Shirts' section, he receives a second notification offering an additional 10% discount for 2 purchases.

After saving the coupon, he moves to the 'Jeans' counter—but can't make his way through the crowd.

Scanning a QR code at the counter pops up the 'Jeans' page in the store's app. He finds what he's looking for and uses the app to pinpoint its location in the store.

Now with two shirts and a pair of jeans, he goes to checkout. After the cashier scans the products, the consumer presents his coupon. After scanning the coupon's barcode, the consumer is presented with his bill, which he pays with his mobile wallet, tapping his mobile phone on the NFC POS to complete the transaction.

Conclusion

Clearly, the potential of BLE is tremendous. Much of that capability stems from the fact that it is not so much a direct competitor to existing technologies like NFC, but works in tandem with them to provide a more holistic consumer experience instead. With continuous, ongoing research and increasing attempts to drive the adoption of BLE, there is little doubt that we will see innovative, widespread use of the technology in the near future.

About mobiquity® Wallet

With an aim to transform retail experience, Mahindra Comviva is accelerating the adoption of technologies such as BLE and NFC through mobiquity® Wallet. mobiquity® Wallet is a secure, easy to use and feature-rich digital wallet that combines a deep understanding of consumer behavior with cutting edge digital technology. It helps telecom operators, financial institutes and retailers to create unified and engaged consumer experiences through personalization, value-added services and support for multiple payment methods. For the business, this means driving the growth and staying relevant to the evolving markets and consumer behaviors.

By digitizing and integrating the consumer's complete payment journey from pre-payment to post-payment, mobiquity® Wallet makes for a truly immersive as well as informative shopping experience enriched with loyalty, couponing, contextual commerce and location based services. To the wallet provider and their partners, it offers a flexible platform of innovation in payments and a robustness that is designed to support a large and complex ecosystem. The solution is designed to be flexible and is one of the first wallet platforms to use BLE, NFC, HCE and QR Code to support diverse and ever changing retail scenarios.

About Mahindra Comviva

Mahindra Comviva is the global leader in providing mobility solutions. It is a subsidiary of Tech Mahindra and a part of the USD 16.7 billion Mahindra Group. With an extensive portfolio spanning mobile finance, content, infotainment, messaging and mobile data solutions, Mahindra Comviva enables service providers to enhance customer experience, rationalize costs and accelerate revenue growth. Its mobility solutions are deployed by 130 mobile service providers and financial institutions in 90 plus countries, transforming the lives of over a billion people across the world. For more information, please visit: www.mahindracomviva.com