BLE IN EVERY BUILDING BY 2025

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The market for indoor location, and in particular Bluetooth low energy (BLE), continues to expand rapidly into a wide range of verticals, yet we have not seen the "Pokémon effect" that many predicted. ABI Research believes a single "killer app" is not required to stimulate this market; instead, the evolution of the ecosystem combined with new technical capabilities and easier methods of deployment means that we are reaching a point of exponential scale and opportunity.

KILLER APP OR KILLER APPLICATIONS? NEWS

With GPS, we had navigation, but the reality is that adoption could never have happened without two key building blocks already in place: infrastructure in the form of the GPS constellation and functional maps/POI databases. The indoor location market is almost working in reverse, organically growing on a building-by-building basis.

Instead of a killer app, ABI Research is seeing killer applications like wayfinding, asset tracking, customer analytics, hyperlocal offers, retargeting/attribution, and resource management. New BLE technology advances over the last 12 months mean that each of these applications can scale across hundreds of thousands of buildings globally over the next 5 years, eliminating many of the deployment and management impediments that have held back the mass market adoption to date.

8 BLE ADVANCES THAT WILL CREATE A MASS MARKET IMPACT

The BLE industry has taken the lessons learned from initial deployments over the last 3 years and evolved to adopt approaches that will enable the market to scale.

- Lose the "beacons": As counterintuitive as this sounds, software-based virtual beacons minimize, and in some cases remove entirely, the need for dedicated physical beacons, which minimizes the friction that previously existed when deploying BLE. For example, virtual beacons solve the headache of replacing batteries, doing BLE site surveys, and handling expensive beacon moves/adds/changes.

- Integrated, multi-purpose infrastructure: By deploying BLE on the same hardware as Wi-Fi, LED lighting, cameras, *etc.,* the concern of having to deploy a proprietary overlay network is eliminated. Companies can save time and money when rolling out location services. In addition, they can use common management tools for better economies of scale and lower learning curves.

- We are also starting to see the same Wi-Fi/BLE infrastructure support integrated sensors for IoT. This is paving the way for a common standardized way to handle all wireless data, regardless of the format or origin.

- Automate management and maintenance: IT departments do not want a technology that requires constant management. Limited battery life, stolen beacons, failing signals, frequent product replacement, constant onsite support, and inaccurate location are all things IT does not want to deal with. New cloud-based systems enable IT departments to easily manage and control software-defined beacons *via* intuitive User Interfaces (UI), while also building in features such as automated workflow and script-handling of updates across large beacon networks.

- Dynamic mapping techniques: Enable building owners to "map and maintain" passively. As far as building owners are concerned, up-to-date indoor maps should just "exist" like outdoor maps. Approaches like SLAM, machine learning, and crowdsourced data are starting to mature; make it part of your offering.
- Analytics are at the core of everything: Analytics are the foundation of building ROI from indoor location technologies. By incorporating BLE beacons with the cloud, an enormous amount of data can be stored and analyzed from BLE users, including the number of visits, location of visits, dwell times, and user experience during visits. In addition, BLE provides a standardized way for tracking key assets throughout a facility, such as wheelchairs and display cases. (When BLE is combined with Wi-Fi, similar data can also be collected for Wi-Fi users, creating even more value from an integrated infrastructure).
- Increase accuracy: Venues, such as hospitals, airports, warehouses, and manufacturing, all need multiple levels of accuracy for different applications. New BLE technologies have increased indoor location accuracy quite substantively. For example, 1 to 3 meter accuracy is now possible thanks to dynamic BLE antenna arrays in Access Points and real-time machine learning that constantly fine tunes location accuracy based on changing device characteristics and environmental conditions.
- Hybridization of location technologies: Handset-based indoor location is coming and will exponentially change the rate of scalability. But these technologies will still require infrastructure. Companies need to provide building owners with both approaches where and when they need them.
- Look beyond apps: While branded apps are an important part in reaching customers, look to new opportunities that can significantly increase your reach and frequency. Google Nearby uses beacons to deliver relevant content without the many frictions associated with apps. Expect others to follow with similar approaches. In non-consumer-facing deployments, cloud-based data analytics is the first logical step in implementing these technologies.

UBIQUITOUS BLE BEACONS ACROSS ALL VERTICALS — COMMENTARY

With these new approaches, the adoption of indoor location using BLE is now forecast to spread rapidly across a range of consumer, corporate, and industrial markets. ABI Research has forecast that total BLE installations in public buildings like retail, hotels, airports, stadiums, *etc.,* will grow with a CAGR of 46.2%. ABI Research has also forecast very strong adoption of BLE in corporate and domestic buildings, driven by the smart home, healthcare, and building automation industries.

With BLE offering better performance at one-tenth of the cost of other technologies, it will also be a major disruptor in the US$15 billion industrial RTLS/asset tracking market, opening up new opportunities around compliance, traceability, automation, and condition monitoring. Finally, ABI Research is also seeing the first signs of significant adoption in "outdoor" markets like smart cities, transportation, and OOH advertising.

Very quickly, BLE location services will become an everyday occurrence in our lives. This familiarity will breed awareness and ultimately an expectation for the services that beacons will enable, just as we have come to depend on GPS and location based services (LBS).