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PRESS REVIEW

Geoplace.com
April 26th 2013

Issue Date: , Posted On: 4/26/2013

http://www.geoplace.com/ME2/dirmod.asp?sid=&nm=&type=MultiPublishing&mod=PublishingTitles&mid=13B2F0D0AFA04476A2ACC02ED28A405F&tier=4&id=6B8D16A35B6B4CDC9FB10838D1C71C74

Indoor Location Technologies Reach Maturation, Larger Audiences
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Online Exclusive

By Christian Carle

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Thanks to free access to GPS and the huge growth of the worldwide smartphone market, satellite navigation now is natively integrated in smartphones, regardless of operating system (iOS, Android, Windows 8, etc.). Today, no one would purchase a brand-new mobile device without outdoor positioning services.

However, most users don't know how it works; satellite, terrestrial system or both? And they don't care. What matters is that the service is delivered.

According to the Groupe Speciale Mobile Association (GSMA), global smartphone penetration in 2014 (of new handset sales) is 37 percent, and, in some countries such as Singapore, the penetration will exceed 90 percent. Regardless of smartphone, the most important applications relate to mapping and navigation. Apple, with its brand new iPhone 5, knows exactly what it means. The iPhone 5 wasn't so new (no revolution), and the most important mobile app (the inhouse Apple Map) was far behind the previous one based on Google's maps.

Moving Indoors

Indoor location and navigation are following the same path. Most of the time, people use their smartphone indoors, and soon no one will purchase a mobile device without indoor location capability.

The technology is mature. Mobile applications increasingly integrate indoor location technology. Various technical solutions have been tested by several laboratories and startups worldwide. Proof of concept has been implemented—some were a success, some were failures, but now the maturity is here and backed up by experienced companies.

Even if a lot of startups arrive on the market every month with a “revolutionary” solution, they typically reinvent the wheel (i.e., ultrasound, infrared, GPS repeater, pseudolite, Earth magnetic field, LED light, etc.). But the proven maturity of existing and robust indoor location technology paves the way of new use cases.

Mall Budd is a smartphone app that features indoor mapping.

Consumers are more than happy to use their mobile phones everywhere; for car navigation, Web navigation, e-commerce, mobile commerce, booking entertainment, traveling, paying, sharing, commenting, etc. Google and Apple claim more than 700,000 applications on their respective application stores (i.e., Google Play and Apple Store).

Making life easier now is a key part of consumers’ decision to buy a smartphone. As part of it, indoor location service isn’t a “nice to have” feature, but a “must have” feature.

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The Future of LBS Services Is Indoor

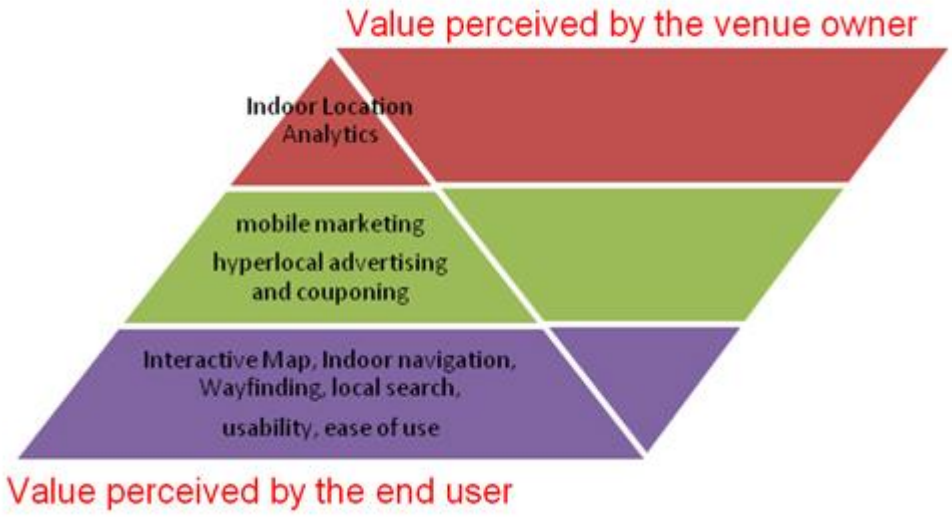
The location-based service (LBS) story is long. In the early 1990s, thanks to Teletrac, the world's first dynamic real-time stolen-vehicle recovery service was launched. In the late 1990s, thanks to Ericsson, the "smartphone" concept appeared. The first mobile operating systems coming from smartphones' ancestors (e.g., PDA, Palm OS, BlackBerry OS, Windows CE, etc.) contributed to the success of the "all in one" unique mobile-device concept. All these mobile operating systems disappeared, leaving the space to Apple's iOS and Google's Android. Microsoft (Windows 8) and BlackBerry put a lot of effort to come back in the arena, because smartphones create value.

Local search, product search, people search and mobile payment are the pillars of mobile commerce, and retailers are being hurt by e-commerce competitors. They need to react and find a way to convince buyers to come back to the physical world. A smartphone with indoor location capability is one of the most powerful tools to reproduce the e-buyer user experience in the real world.

ABI Research forecasts that total indoor location technology installations approached 10,000 stores by the end of 2012. Most of these installations are located in stores in the United States, where retailers have been more proactive in adopting location technology than elsewhere.

Promising Use Cases for Indoor LBS

Most mobile applications are free. "Free" means "free" for users, but someone has to pay for them, and if someone pays, a return is expected. The most obvious return is linked to mobile commerce. How do companies incentivize consumers to purchase and create value for retailers, venue owners or venue managers? The perceived value of the end user is inversely proportional to the perceived value to the venue owner that implements indoor LBS.



Due to the perceived value of indoor location analytics, retailers or venue owners are reluctant to rely on third-party solutions such as Google Map Indoor and want to control of the data collected about their customers.

Indoor LBS: Value Chain

Vendors that contribute in the indoor LBS value chain include indoor location services, content providers, application platform vendors, applications and carriers. Indoor location services must guarantee 3-D (x,y,z) accuracy, compatibility with indoor pedestrian navigation requirements (2-5 meters of accuracy), seamless outdoor/indoor/outdoor transitions and continuity of service among different environments, and do it transparently for users.

Content vendors provide a variety of data that power LBS applications. Content includes digital indoor maps, wayfinding, points of interest and real-time hyper-local information. LBS application platforms provide development environments and technologies that allow vendors to provide applications based on indoor location services as well as a backend to collect data related to usage and analytics. Mobile indoor LBS applications are customized applications used to serve a specific market need, brand or venue (e.g., shopping mall, airport, exhibition center, train station, museum, etc.).

Upstream, infrastructure such as Wi-Fi or Bluetooth is needed as well as the technology and tools to extend indoor location service coverage. Downstream, there's the carrier, which is often linked to infrastructure.

Indoor LBS Tomorrow

To be part of the future of indoor LBS, existing geo industry players can't stay on the sidelines as witnesses. With the technology's evolution, indoor core location technology may become natively part of mobile devices. In addition, with process maturity, indoor location services soon will become available everywhere in large buildings and venues, offering a continuity of service (outdoor/indoor).

Stakeholders in the "outdoor" world have the most to loose as they consider indoor location technology as a marginal part of their future market. The indoor location market has finally reached maturity, overcoming its main technological barriers that drove, for the first time in its history, large-scale deployments at airports, museums and malls.