

## Indoor Location Technology OEMS

CA-1174

### Competitive Assessment Introduction

There have been some significant changes to this competitive assessment in 12 months. The Indoor Location market is constantly evolving and changing. From a company point of view, there continues to be a steady stream of new entrants, particularly with BLE beacons democratizing the industry and enabling adoption of indoor location across all verticals in all regions simultaneously. Alongside this, there has been a spate of acquisitions over the last 12 months, led by Wi-Fi access point and retail analytics/technology companies. ABI Research believes this trend will continue over the next 12 months as carriers, business intelligence/CRM companies, handset OEMs, advertising, and local search companies look to enter this space.

What defines a successful company is also changing. Previously a company was viewed in terms of the accuracy and scalability of its technology, it is now much more about hybridization, support for mapping, inventory, and advertising, as well as the all-important deployments and customer relationships. There are still new technologies emerging that could have a huge impact on the market, such as LED and magnetic field as well as sensor fusion, which is already established as a must for any company in this space. The best companies will be capable of incorporating these technologies as and when they are available. What differentiates the winners this year is not necessarily the technology but the ability to successfully use it for applications and services. ABI Research is identifying a number of companies that are now becoming specialists in particular applications or verticals, because they have proof of concept deployments in place.

From a technology point of view, there has been significant change in the past 12 months. ABI Research has strongly backed BLE as an important technology in the past and correctly forecast that Apple would move in this direction. Despite this, the popularity and adoption of the technology has still been surprising over the last 12 months with device OEMs struggling to keep up with developer demand. What is also interesting is that BLE beacons are now not only expected to be the base technology on which hybrid deployments will grow, but it is really widening the scope of the market beyond retail into connected home, personal tracking, corporate, and even out-of-the-home marketing on public streets. Wi-Fi has been badly affected by high prices and Apple's decision to randomize MAC addresses. ABI Research still believes that it has an important part to play, but to rely solely on this technology looks to be an unwise decision as retailers look to ensure they have proper coverage of Apple devices. In fairness, most of the major Wi-Fi players have either already migrated to BLE and other technologies or are in the process of doing so. As mentioned, LED and magnetic field technologies have received major backing in 2014 and can be major disruptors in this space. Similarly, audio remains an underutilized technology and has huge potential when combined with digital signage, TV, radio, etc., following SK Telecom's acquisition of Shopkick. Signal360 is the only major start-up in this space, but it is an area that others are starting to look at also.

An interesting addition this year is the inclusion of Electronic Shelf Display (ESL) technology in the competitive assessment. ABI Research believes that ESL can become an integral building block in the retail technology ecosystem, providing a concrete link between the customer/smartphone and the product on the shelf, back-end data, and product information. It is also a key technology in enabling dynamic pricing, which has really caught the imagination of the retail industry in 2014. Already, indoor location companies are forming partnerships with the leading players in this space as both technologies are very complimentary. Finally, the inclusion of BLE beacons in ESLs gives these companies the ability to be indoor location providers in their own right. As this market is still very nascent, ABI Research has decided to cover this area as a whole, rather than isolating a particular company. A full report on this area is also available in ABI Research's [Location Technologies Research Service](#), with a more detailed competitive assessment.

## Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

### Rankings

After individual scores are established for Innovation and Implementation, an overall company score is established using the Root Mean Square (RMS) method:

$$Score = \sqrt{\frac{innovation^2 + implementation^2}{2}}$$

The resulting overall scores are then ranked and used for percentile comparisons.

The RMS method, in comparison with a straight summation or average of individual innovation and implementation values, rewards companies for standout performance.

For example, using this method a company with an innovation score of 9 and an implementation score of 1 would score considerably higher than a company with a score of 5 in both areas, despite the mean score being the same. ABI Research believes this is appropriate as the goal of these matrices is to highlight those companies that stand out from the others.

### Overview

There have been some significant changes to the competitive assessment in 12 months. A number of companies have dropped out of contention, while some like Qubulus have folded completely. Following the split of the company, Nokia has also dropped out of the list from a top 5 position, until such time as it illustrates a clear indoor location strategy again. It has been demoing some new technology but it is too early to include it in this competitive assessment. Others like Movea and Meridian have been acquired. In come new companies like IndoorAtlas, Philips, Euclid, Estimote and ESL vendors, all of which have made significant progress in this space over the last 12 months.

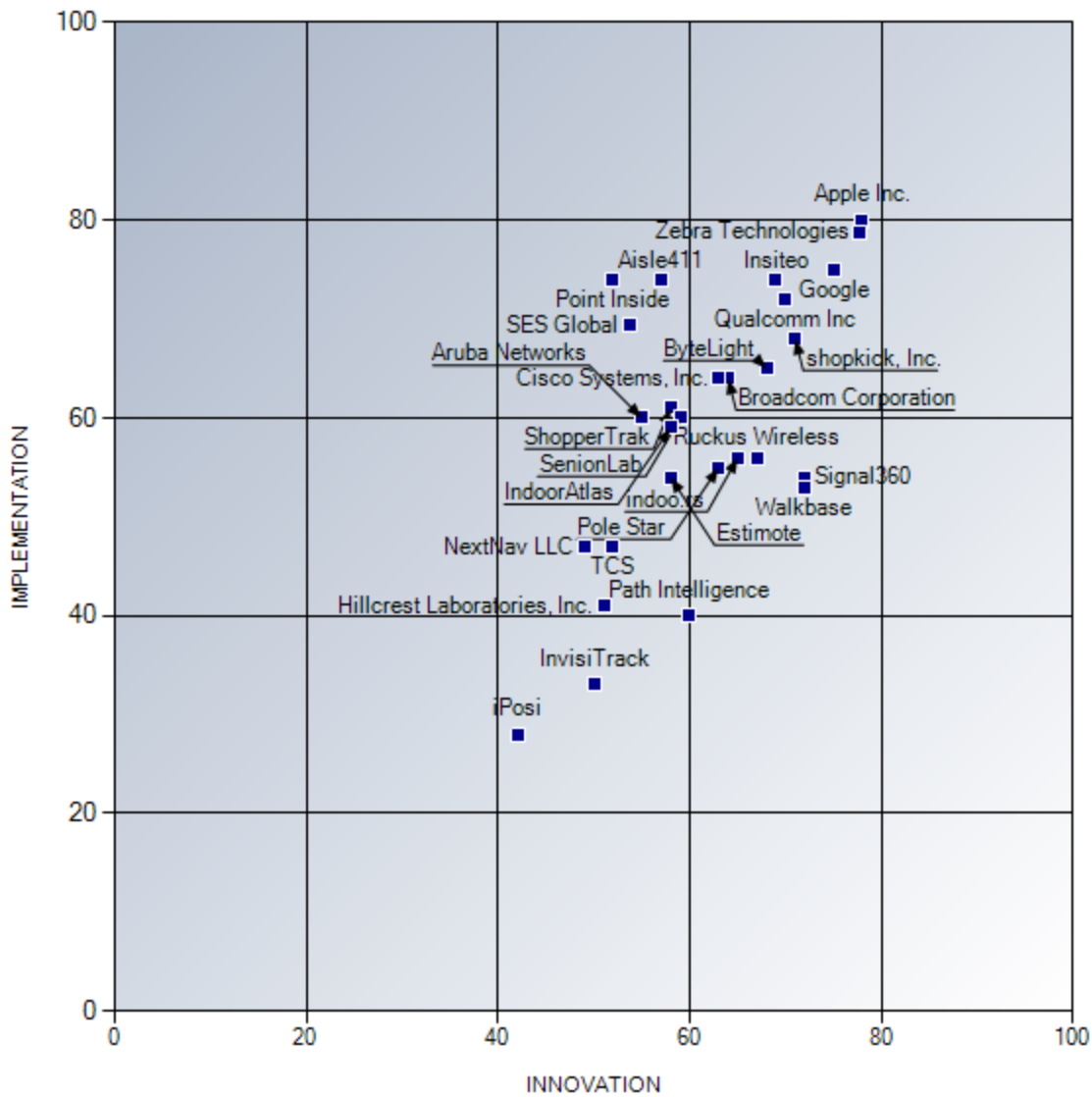
At the top there has also been significant change. Google's lack of progress has cost it as Apple has taken the bull by the horns and is now driving this market forward. Zebra's proposed acquisition of Motorola will create a very impressive retail technologies group. Its high ranking is still based on potential and it will need to deliver in 2015. Qualcomm has dropped slightly following its decision to spin out Gimbal. It still has a huge part to play in this industry, but it is clearly not looking to own the stack and play a part in all aspects of the market.

It may surprise many to see Insiteo feature so highly in 2014, but as a location technology company expanding into a complete platform while winning important contracts, it is difficult to see another start-up that has achieved more. The app-focused companies like shopkick, Aisle411 and Point Inside have also established themselves firmly in 2014 and it would not surprise ABI Research to see Aisle411 and Point Inside follow shopkick with a large acquisition in 2015.

### Vendor Matrix Results

Company	Overall Ranking	
	Score	Rank
Apple Inc.	79.0	1
Zebra Technologies	78.3	2
Google	75.0	3
Insiteo	71.5	4

Qualcomm Inc	71.0	5
shopkick, Inc.	69.5	6
ByteLight	66.5	7
Aisle411	66.0	8
Broadcom Corporation	64.0	9
Point Inside	64.0	10
Signal360	63.6	11
Cisco Systems, Inc.	63.5	12
Walkbase	63.2	13
SES Global	62.1	14
Ruckus Wireless	61.7	15
indoo.rs	60.7	16
ShopperTrak	59.5	17
SenionLab	59.5	18
Pole Star	59.1	19
IndoorAtlas	58.5	20
Aruba Networks	57.6	21
Estimote	56.0	22
Path Intelligence	51.0	23
TCS	49.6	24
NextNav LLC	48.0	25
Hillcrest Laboratories, Inc.	46.3	26
InvisiTrack	42.4	27
iPosi	35.7	28



## Market Share: Retail Indoor Location, Analytics, and Advertising

shopkick, Point Inside and Aisle411, 3 companies that helped create this market, are now leading the way in terms of deployments. Over the past 12 months there has been a considerable change in deployments as companies have moved from a handful of deployments to getting into the hundreds and thousands of stores, with retail chains at advanced stages of trialing.

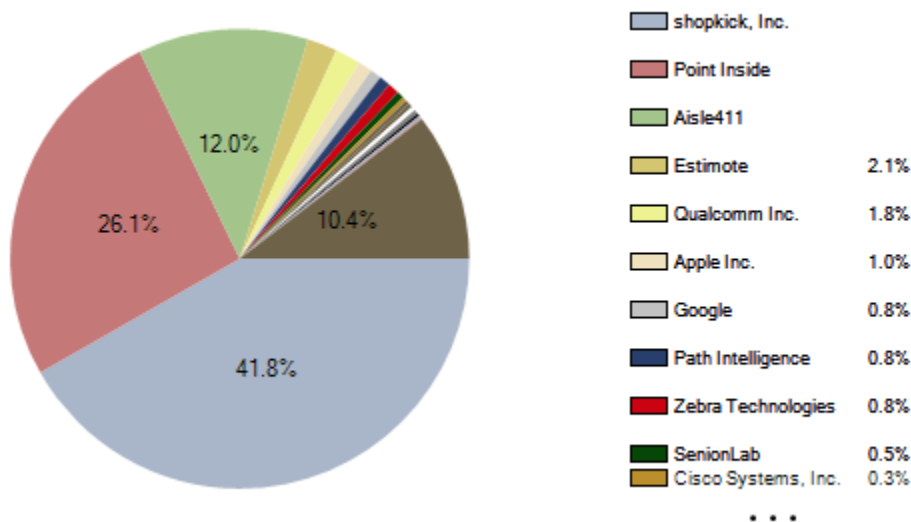
The year 2015 could see a major jump as we see the first chain-wide deployments. The wide spread of BLE beacons makes it very easy for retailers to deploy a very light system to test the water and measure shopper acceptance. We will also see the first year when Ruckus Wireless, Aruba Networks and Zebra Technologies (following the acquisition of Motorola Solutions) will all have a comprehensive offering that most likely will combine Wi-Fi with BLE and other technologies.

In terms of attrition it is hard to see any company on the list below with deployments disappearing in the next 12 months. Most have been in place for a few years, have overcome initial problems and now have either the retail or technology partners that can enable them to grow. Companies that look best placed to be acquired include Aisle411, Point Inside, Hillcrest, indoo.rs, SenionLab and Signal360.

## Market Share Results

Company	Overall Market Size (Venue Deployments)	Share
shopkick, Inc.	8000	41.8%
Point Inside	5000	26.1%
Aisle411	2300	12%
Estimote	400	2.1%
Qualcomm Inc.	350	1.8%
Apple Inc.	200	1%
Google	150	0.8%
Path Intelligence	150	0.8%
Zebra Technologies	150	0.8%
SenionLab	100	0.5%
Cisco Systems, Inc.	60	0.3%
Ruckus Wireless	60	0.3%
Aruba Networks	50	0.3%
Insiteo	50	0.3%
Pole Star	50	0.3%
Walkbase	45	0.2%
Signal360	30	0.2%
ByteLight	10	0.1%
Broadcom Corporation	0	0%
Hillcrest Laboratories, Inc.	0	0%
indoo.rs	0	0%

IndoorAtlas	0	0%
InvisiTrack	0	0%
iPosi	0	0%
NextNav LLC	0	0%
SES Global	0	0%
ShopperTrak	0	0%
TCS	0	0%
Other	2000	10.4%
Total	19155	100%



## Individual Company Assessments

### Aisle411

Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

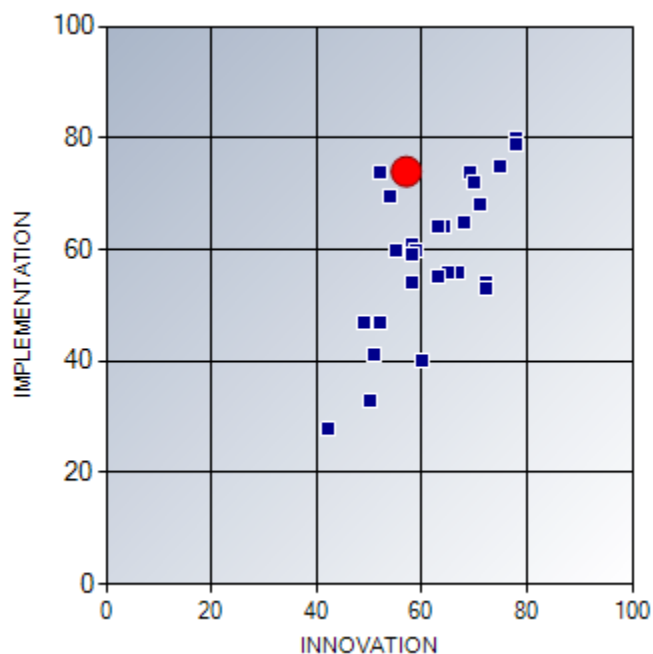
#### Summary

**Innovation: 57**

**Implementation: 74**

**Overall: 66**

**Rank: 8**



#### Implementation

Aisle411 has rapidly grown from a third party mapping application to supporting a range of features and SDKs for retailers, brands, and developers, covering location, geofencing, analytics, advertising, navigation, product search, etc. The company's main advantage has been in seeing the importance of detailed mapping of inventory, which in turn feeds high quality in-store product search and more broadly hyperlocal search (17 out of 20). Its hybrid location technology (following the acquisition of WiLocate in 2012) combines existing in-store Wi-Fi with handset-based sensor fusion. It has also recently announced a partnership with Estimote to support iBeacon technology and more importantly coverage of Apple devices, as well as a partnership with Motorola (BLE, Wi-Fi, LED/VLC via ByteLight investment), which is soon to be acquired by Zebra Technologies (7 out of 10). It has its own map SDK (15 out of 15) and currently supports over 10,000 maps with plans to reach 50,000 by 2015. It has already established some very important partnerships (9 out of 10) with Walgreens, Home Depot, RedLaser/eBay, Lowe's, and is now working across 13,000 stores. It has also begun to work with Google on Project Tango, keeping it at the cutting edge of innovation in this space, while also boosting awareness. It also closed a US\$6.3 million round of funding in September 2013, giving it the financial space to grow.

#### Innovation

Analytics does not appear to be a major part of Aisle411's offering but ABI Research assumes that it offers these services given its capabilities and tight inventory integration (10 out of 20) in comparison to some of its competitors, having chosen to focus on other aspects of the market to great effect. With the launch of its own location technology, it is in a good position to expand its analytics capabilities. Currently, it only offers a handset-based technology (12 out of 20), although ABI Research believes that its APIs may be baked into Wi-Fi access points in the future, which would make it much easier for IT departments to integrate location data from the application. Aisle411 is very much focused on the retail market (7 out of 10). It offers retailers, brands, and companion developers/publishers a range of SDKs and APIs (8 out of 10) covering hyperlocal, aisle level search (Aisle411 API), indoor maps (Maps SDK), geofencing (private beta), product recommendations (Ad SDK), and location aware messaging/ads (AD SDK). The technology has no implementation costs of note (10 out of 10), and does not support Z-direction location (0 out of 10).

In reality Aisle411 is not a true indoor location company as ranked in this competitive assessment, and is more of an app development company. This should limit the company as these spaces become commoditized, but the company's work on inventory and broader hyperlocal search makes it very unique (8 out of 10) and has significant future potential (8 out of 10). This is reflected by Google's decision to work with it on Project Tango. Aisle411 is also working with notable start-ups in the inventory space, who are building huge databases of dynamic product information to enable a retailer to find the exact product they are looking for at the best price, based on their location. This will be the next battleground for Google and Apple, with Aisle411 emerging as an important element, especially given it must now how the most announced in-store deployments at the time of writing.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

#### **Market Share: 12%**

Aisle411 is now emerging as one of the market leaders in the U.S. retail technology market, combining a strong offering with very intelligent partnerships and a long term vision of where the market is heading in terms of hyperlocal search. Its partnership with Walgreens means it is the first *bona fide* success story across a large chain. Much like shopkick, the company is perfectly positioned for acquisition but gives all the signs that it is more than capable of being a major player in its own right.

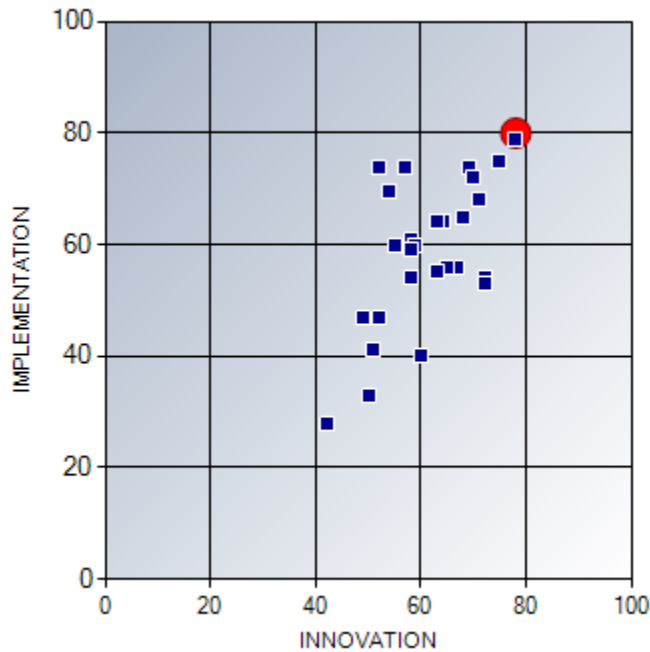


## Apple Inc.

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 78**  
**Implementation: 80**  
**Overall: 79**  
**Rank: 1**



#### Implementation

It's clear that Apple is now aggressively supporting ubiquitous always-on location as part of a much wider strategy around connected home, IoT, quantified self and ambient intelligence (18 out of 20). The acquisition of WiFiSLAM coupled with the development of the iBeacon standard illustrates a commitment to indoor location (10 out of 10). Its M8 coprocessor has been designed with sensor fusion in mind and it has now leapfrogged Google significantly in terms of both its indoor location capabilities and the APIs it makes available to developers. It also has recently taken the founder of Wifarer on as a consultant.

With iOS 8 Apple has announced an indoor location technology based on Wi-Fi and sensor fusion, but we still haven't seen anything official in the wild (accuracy 7 out of 10), although it has extended map kit to also support indoor mapping (7 out of 15). With the acquisition of WiFiSLAM almost 2 years ago, Apple should now be at advanced stages in terms of its location capabilities. Apple is believed to be trialing this new handset-based technology with key application and venue partners.

The new iOS 8 operating system, has a number of other features that indicate the direction Apple is heading.

- Opt-in: Enabling the consumer to set when he/she would like to receive notifications, if at all, i.e., never, with app running/app in background
- HealthKit: Quantified self and ambient intelligence

- Lock-screen Icon: Launch an already downloaded application or create a link to an application in the App Store
- HomeKit: Connected home
- Touch ID: Fingerprint technology capable of supporting verification
- Map Kit: Extended indoors
- App Recommendation: iOS will make recommendations of useful apps based on nearby locations, Pols, etc.

### Innovation

Apple does not have its own analytics tools but is currently hiring location analytics specialists (5 out of 20) at the time of writing. Apple has cleverly blocked access to accurate MAC address info on iOS 8, which could hinder passive Wi-Fi based technologies. Ironically, Apple doesn't get full marks for combined location (15 out of 20), because it has only publically released its infrastructure solution. Developer support is improving significantly in iOS 8 and we can expect Apple to continue to release and update related APIs. However, it continues to block handset-based Wi-Fi location. Apple is not as focused on advertising (7 out of 10) as Google, identifying it as a differentiator, but it is clearly an important part of its future revenue plans. ABI Research expects ubiquitous location technology to be an important part of its wider efforts to build its own local search competitor to Google. In the meantime, beacons will generate a new medium for delivering advertising.

In the past 12 months Apple has improved significantly and is now ranked first, up from fourth. It is gradually putting together the nuts and bolts necessary to support next generation services, that go beyond retail and payment into a number of new exciting areas. Of most importance will be the move to ambient intelligence and how this could be key to being a viable competitor to Google Search on its devices.

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 1%

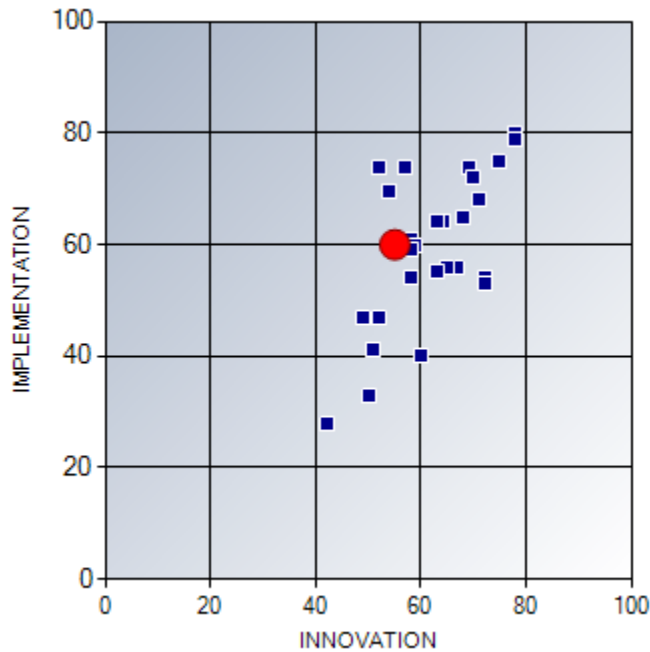
It is difficult to rank Apple beyond its own stores, because it does not appear to be working at the retailer level yet, with a cohesive offering built around iBeacons and handset-based location. ABI Research believes it will look to build up a network of retailers through its mapping services. It may even create an open indoor mapping offering that would be a big step in attracting retailers to share data. Ultimately, the iBeacon standard has been built with the consumer in mind, leveraging its installed base to force retailers to adopt its payment and passbook offerings. It is a stealth approach that is already sending shockwaves through the NFC community, as major stakeholders realize they have no option but to support Apple. Apple's long term aim will be to create a centralized service for users that aggregates all offers, loyalty, etc., while also enabling next generation mobile search-hyperlocal search.

## Aruba Networks

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 55**  
**Implementation: 60**  
**Overall: 57.6**  
**Rank: 21**



#### Implementation

Aruba entered the indoor location game in 2013 with the acquisition of Meridian. Not much has changed in its offering the intervening months, with Meridian continuing to operate independently offering a complete suite of tools for building owners to create a venue application, which has historically been its strength. This suggests that the first major combined offering from both companies should be coming soon.

It receives a value chain support score of 12 out of 20. While it doesn't have a complete offering itself, it has formed partnerships with analytics companies, etc., to flesh out its offering and ensure it is offering best of breed technology. Its mapping capabilities are some of the best available, creating interesting and user friendly renditions of a building. However, it needs to find ways for the technology to scale as well as looking at passive SLAM technologies, to ensure it can remain competitive rather than being a niche provider (8 out of 10). The company has never really had its own location technology (5 out of 10), previously relying on Cisco. Aruba will give it the opportunity to develop interesting offerings around Wi-Fi, but with changes to both Android and iOS around randomization of MAC addresses, Wi-Fi based systems are under pressure. BLE beacons would appear to be a way around many of these problems. However, it will need to bring something to market sooner rather than later that isn't just box ticking.

In terms of contract wins and market presence (5 out of 10), the acquisition has yet to have a significant public impact, but Meridian's solutions are used in a wide variety of verticals including, retail, hospitals, sports venues, museums, public venues, etc. What is particularly interesting is that it is winning business on top of Wi-Fi systems from competitors like Cisco.

Prior to the acquisition, Meridian was one of the trailblazers in indoor location with very strong partnerships. It has decided to keep Meridian as a separate entity, which should help to drive adoption more freely, while continuing to work with competitor customers. Aruba has its own Edge partner program, to help drive adoption of its technologies. Aruba's Wi-Fi technology is becoming more widely used with particular strength in the corporate area (9 out of 10) through its MOVE architecture and ClearPass solution, which have a number of core benefits around BYOD security/authentication and QoS; it enables businesses to control who has access to what information. This inherent network intelligence also has a lot of potential around indoor location applications and analytics, making the process easier for both building owner and network user.

### Innovation

Since the last edition of this report, little has changed in terms of Aruba's overall offering. ABI Research understands that it is gradually putting together a much richer offering, but until then, standing still must be considered a step backwards in this market. As a result Aruba's overall innovation score is lower this year. Meridian now offers its own blue-dot location technology courtesy of Aruba Networks, but it does not seem to combine this with any handset-based technologies, which is a must (8 out of 20). The ability to work on top of competitors' infrastructure gives it a good penetration score (8 out of 10), but Aruba does not traditionally have the same level of Wi-Fi penetration as the likes of Cisco and Motorola.

In the past Meridian's offering was considered expensive (6 out of 10). This will only be exacerbated by the arrival of BLE beacon companies. ABI Research assumes that Aruba will build a new pricing model around a new infrastructure/service contracts, which should help to lower costs. Otherwise it will quickly find it is too expensive to compete.

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0.3%

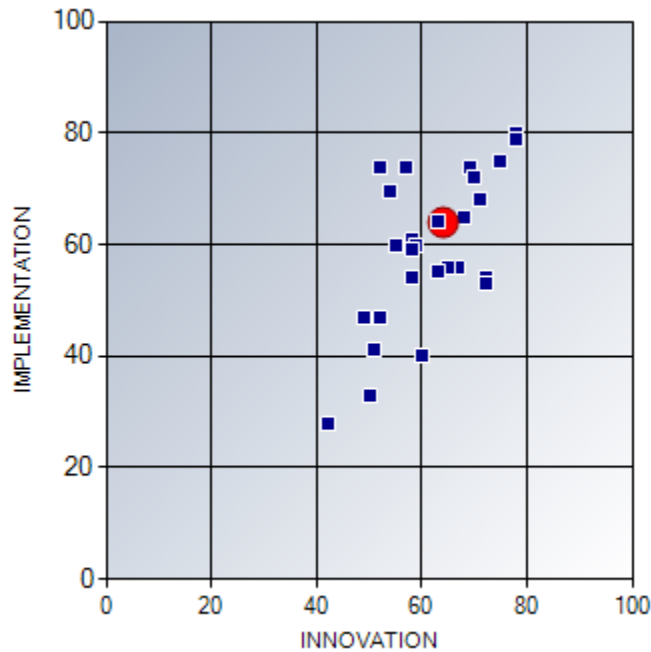
Aruba and Meridian are an interesting combination. Meridian has kept its cards close to its chest last year, but even with the success it has had, like all Wi-Fi based providers, it is in danger of becoming overwhelmed by the new surge of developers building applications around BLE beacons. Aruba Networks is a very tactical company that has acquired a company capable of working on top of its competitor's technology. It is positioned as a premium Wi-Fi offering, with very strong customer support, security/guest Wi-Fi authentication and BYOD device capabilities. This has given it a strong corporate position, while also enabling it to grow in the retail space. We have seen many of the early companies in this space take the lead over the last 12 months, such as Aisle411, Point Inside and shopkick. Meridian is in a similar category and could be the next to grab the headlines. With Aruba's Wi-Fi and IT capabilities, it should be able to launch something new and innovative in the near future that will enable it to do just that.

## Broadcom Corporation

Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

### Summary

**Innovation: 64**  
**Implementation: 64**  
**Overall: 64**  
**Rank: 9**



### Implementation

Broadcom retains a maximum score for its hybrid approach (10 out of 10). The recently announced BCM4773 IC combines concurrent GNSS location, with dedicated processing power to support sensor fusion, cellular, BLE and Wi-Fi location capabilities. Broadcom is differentiating itself by supporting its own proprietary AccuLocate Wi-Fi technology, as well as including support for OmniTrail and NextNav.

Despite selling its cellular platform business, Broadcom remains a key connectivity IC vendor (8 out of 10), one of the few that has survived the recent wave of attrition in the market. It remains a potential acquisition target for one of the big handset vendors, looking to retain total control of design. It is also well positioned to be a leader in the emerging smartwatch/fitness market, which can become an integral way to interact with beacons/indoor location.

Broadcom's only significant low score (0) is its lack of map support, which is not really the domain of IC providers. Despite this it is actively investigating how it can support passive, dynamic map creation. Like other IC vendors it has scored 10 out of 10 for privacy as, in reality, this is not an issue for these companies, rather the OEMs and application providers that build services on top of their technology.

### Innovation

It's difficult to see another vendor that has been so aggressive in recent years in supporting indoor location at the IC level (17 out of 20). It is playing a major role in driving next generation Wi-Fi location technologies both in proprietary and standardized form. It has not entered the beacon manufacturing market, but it is clear now that companies like Broadcom are not necessary to drive adoption of this technology. It is also working with NextNav, which is looking increasingly like it will have a big part to play in NG911 if it can deliver on its accuracy claims, and not just meet the current mandate requirements.

On power, Broadcom's latest IC offers up to 80% improvement on previous generations and is likely to be one of the ICs that helps to create next generation, always-on location applications (10 out of 10). Broadcom's HULA platform offers developers (8 out of 10) a library of APIs to access its location technologies at a deeper level than offered in typical handset APIs, improving overall performance and optimized indoor/ubiquitous location.

Broadcom received an innovation score of 60, up significantly on last year through the release of its new IC and developer platform as well as its R&D into other aspects of indoor location. Broadcom is strong in Z-direction (10 out of 10) and penetration (8 out of 10). As discussed above, it has strong cellular partnerships, with ABI Research estimating that its GPS ICs were integrated on over 150 million handsets in 2012. It is unclear if, like CSR and Qualcomm, Broadcom will look to charge additional fees to access its indoor location capabilities. While its offering is not as optimized for a recurring fee business model, ABI Research assumes that there will be a premium to at least enable these features (8 out of 10).

As an IC vendor, Broadcom is unlikely to get into the analytics (0 out of 20) and advertising spaces (0 out of 10), which unfortunately affects its overall score in the rankings. This competitive assessment includes a wide variety of companies from different fields, so it is important to not just consider Broadcom's final score, but how it compares against relative companies.

From a cost point of view, ubiquitous location is a big selling point for Broadcom's ICs, and it looks as though it will not go down the road of charging a premium to access these technologies (9 out of 10).

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

##### **Market Share: 0%**

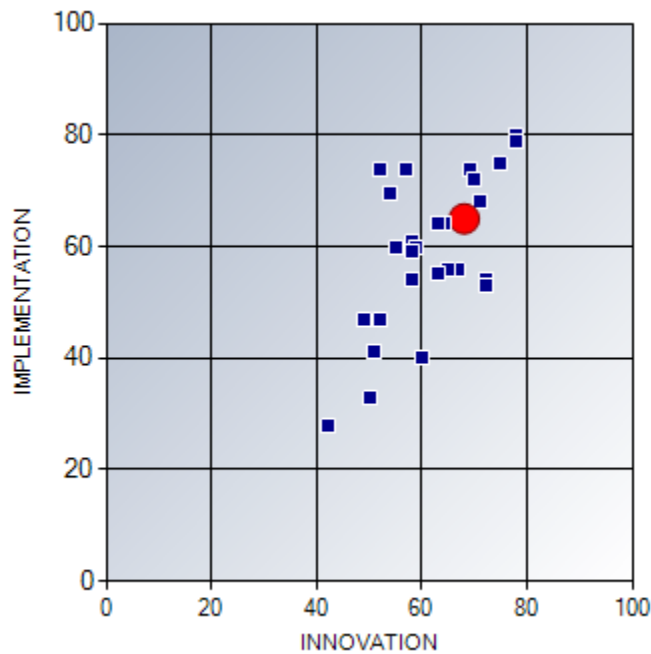
Interestingly, Broadcom could play a major part in adoption of Wi-Fi location technologies for its partners through proprietary technology and its partnerships with OmniTrail and NextNav. It has already displayed its capabilities with Verizon at CTIA in 2014 and it will help to facilitate next-gen Wi-Fi location. Although it still has time to become a BLE beacon OEM, ABI Research believes it would have done so by now. Instead it is providing innovative IC SoCs that will enable vendors to differentiate in this competitive market.

## ByteLight

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 68**  
**Implementation: 65**  
**Overall: 66.5**  
**Rank: 7**



#### Implementation

ByteLight scores 65 for implementation.

ByteLight is another company that has risen to the challenge over the past 12 months and hit all the essential targets needed for it to become a successful player in this space. The need to form a partnership with a major LED OEM has been met with its partnership with GE (9 out of 10). Given that LED lights are forecast to reach 1 billion units per year by 2020, a win with one major OEM can be as big as the total BLE beacon market.

With this in place, the company has looked to expand its overall value chain offering, expanding into integrated BLE beacons (10 out of 10) to create the initial geofence from which high accuracy VLC can take over. It has also launched its own location platform (12 out of 20). It now has a very interesting market presence as the leading LED/VLC company, with investment from Motorola Solutions/Zebra Technologies, potentially opening up broader ecosystem opportunities (5 out of 10). It is also starting to win contracts, with trials ongoing in pharmacy, big box, grocery, etc. It is still a small start-up but one that is so well positioned it doesn't need to look at short term exit strategies.

In terms of accuracy, there is really no technology today that can reach all devices so easily with such consistent accuracy (often sub-meter, 10 out of 10). However, the crux of the technology lies in having to have a line of sight to the smartphone. The problem is partially being solved by the introduction of BLE (prompting users to engage with their phones as and when needed), while intelligent algorithms enable ByteLight's technology to operate while customers hold their device in a natural intuitive way. As a one-way technology, privacy is also less of an issue for this technology (9 out of 10).

### Innovation

ByteLight scored 68 for innovation.

The LED/VLC technology scores very highly for penetration (9 out of 10), and implementation costs (10 out of 10), as it only requires a firmware upgrade of standard LEDs). Adding integrated BLE increases the cost slightly, but it is still sub 10% of the cost of an LED fixture installation, which can be between US\$200 to US\$300. One of the benefits of ByteLight's approach in comparison to other solutions is that it can locate in all 3 axes (10 out of 10).

It has expanded its platform to support analytics (12 out of 20), which can be integrated with existing retail systems. Today it controls the platform and the services, but it does have an SDK which retailers can build into their own applications as and when they chose to do so (7 out of 10).

From a uniqueness point of view, there are now rival solutions from Philips and Qualcomm, but the overall technology is one that could be a major game changer as retail is only on the cusp of moving to LED lighting, *i.e.*, the perfect time to come to market (8 out of 10). The future potential of the company is now very strong (8 out of 10), whereas 12 months ago there were still major question marks.

From the LED OEM point of view, these types of services are essential as they have traditionally worked on a replacement cycle of 3 to 5 years. With LED this shifts dramatically to 10 to 15 years. As a result, they need service revenue to create recurring revenue, after the industry has hit peak-LED around 2018, *i.e.*, the point at which deployments start to decline and the replacement market is still some way away.

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0.1%

ByteLight is very secretive about its deployments as most are under trial at the moment, and we could well see a major chain announce a deployment, coinciding with the integration of LED lighting across their chain. ByteLight has hit all the necessary targets over the last 12 months, partnering with a major LED lighting company in GE as well as a major indoor location provider in Motorola. The company is perfectly positioned as LED lighting is about to take off in retail while lighting providers need to shift way from hardware and into services. Along with magnetic field location, LED/VLC has the potential to be a significantly disruptive technology.

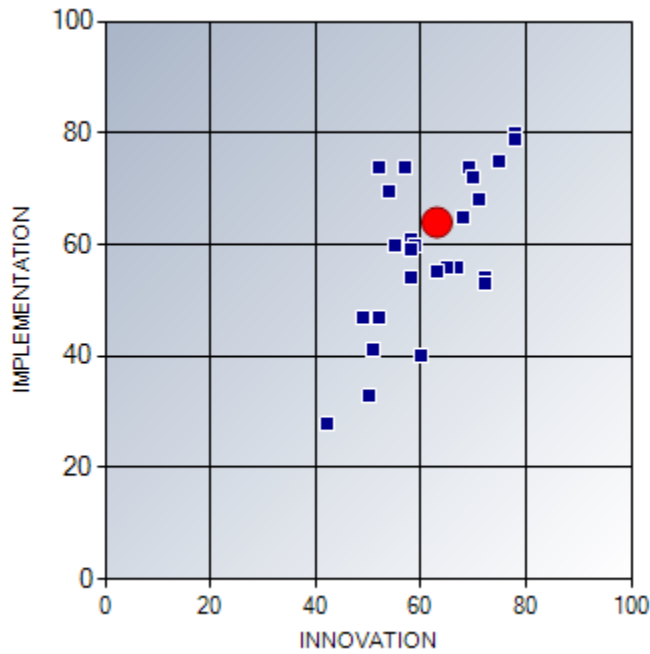


**Cisco Systems, Inc.**

**Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising**

**Summary**

**Innovation: 63**  
**Implementation: 64**  
**Overall: 63.5**  
**Rank: 12**



**Implementation**

Cisco has failed to dominate this space as was once expected, moving far too slowly in terms of embracing new technologies and pricing models. The result is that it has been surpassed by other technologies and overtaken in potential by smaller Wi-Fi access point competitors like Ruckus. Ultimately, Cisco still sits on a huge installed base of access points, while continuing to line up the partners necessary to offer a complete solution, such as estimate. This means that it will difficult for it to fail in this space, but the longer it take for it to win some big contracts and introduce more flexible pricing along with higher accuracy technology, the smaller its piece of the pie will be.

One of the most difficult things with Cisco is that it partners on so many aspects of its offering that it is difficult to give a consistent offering. This problem was highlighted when Meridian, baked into Cisco’s indoor location solution, was a acquired by Aruba Networks. Despite this, the companies continues to have a good value chain support score of (10 out of 20), and is now supporting technologies beyond Wi-Fi, such as iBeacons (9 out of 10). Wi-Fi is now in danger of being classified as an inaccurate technology (7 out of 10). With companies like Ruckus developing their own proprietary technologies, Cisco should be looking to do the same. Standardization will bring this anyway in the next 2 years, but Cisco should be looking to lead the way.

As mentioned, the company has strong partnerships (8 out of 10) across technologies, retail, public venues and corporate/industrial. It also has a presence with carriers on both Wi-Fi and small cells and should have a major part to play there. It has made acquisitions and investments in companies such as ThinkSmart Technologies and Accuris. Its presence (7 out of 10) is probably the reason why it retains a high ranking as it has failed to drive the level of penetration it had planned over the last 2 years.

### Innovation

Cisco has failed to really grow the business in the past 12 months. A typical example is the lack of adoption of the analytics technology it acquired from ThinkSmart (14 out of 20). As mentioned, Cisco has expanded into BLE beacon support *via* partnerships (14 out of 20), which will also help to increase its ability to penetrate into retail (8 out of 10). Probably the lowest score Cisco receives is for implementation costs (5 out of 10). Unlike other access point vendors it has failed to adopt lower pricing models successfully. The company has a choice, try to maximize return from its installed base over time, or drive adoption of indoor location through new pricing models. Cisco is one of the few in this space that can afford to play the long game to some degree given it already has such a healthy installed base.

Cisco also scores (5 out of 10) for uniqueness. Cisco has lots of partnerships but very few deployments. Bob Friday, who was behind much of what Cisco did in indoor has also left the company, which is a little worrying. Despite the relative negativity around Cisco, its future potential remains strong, but only so long as it realizes it has fallen behind and needs to change.

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0.3%

Cisco is already at a transition period. It still sits on a huge installed base of access points in retail but has failed to form the partnerships to create a cohesive low-cost offering, like Motorola. Cisco is very active in small cells and carrier Wi-Fi and it may be that it will instead focus on technology and enable partners like carriers to leverage these capabilities instead of trying to build a complete platform itself. The next 12 months will tell a lot.

## Estimote

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

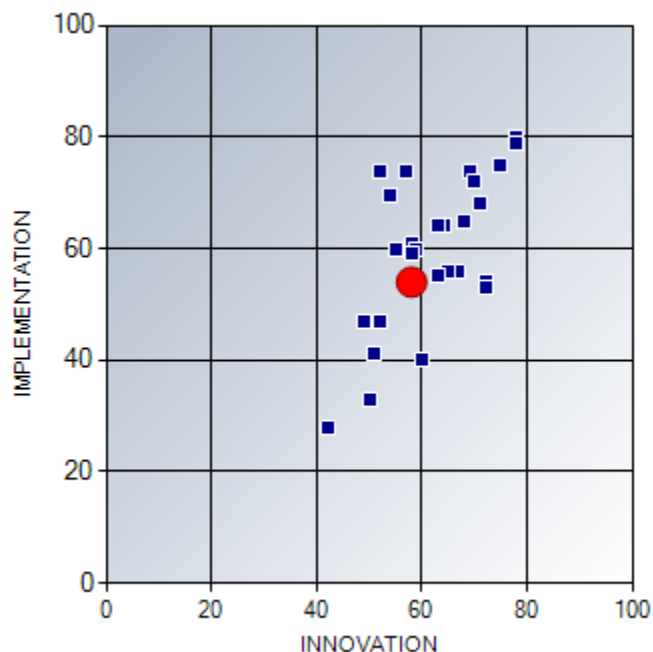
#### Summary

**Innovation: 58**

**Implementation: 54**

**Overall: 56**

**Rank: 22**



#### Implementation

Estimote scores 8 out of 20 for value chain. As a beacon OEM it will understand the limited potential of this hardware market, and while it is one of the leading vendors in this space, it still needs to move up the value chain. A big part of this will be providing content management platforms to customers, as well as potentially leveraging the whole Beacon network for advertising. It is very much focused on just BLE beacons (6 out of 10) given how young the company is, but there is clear potential to leverage handset base technology as and when it becomes available. In terms of accuracy it appears to offer a relatively standard flavor of BLE beacon proximity, with the added benefit of now also offering blue-dot location (8 out of 10), which is a big change for this market, and will open up new service opportunities. It does not appear to have a physical mapping function, but it does now support RF mapping (5 out of 15), which is just as if not more important at the early stages to enable scaling of the technology. Despite being a relative newcomer, it already has a strong market presence (7 out of 10). As well as having a huge army of developers regularly outstripping Estimote’s current production rates, it is also in trials with a number of large retailers (7 out of 10).

#### Innovation

Estimote scores 10 out of 20 for analytics, which is now a market it will surely address with indoor location capabilities. It currently does not combine location (10 out of 20), but its ability to penetrate into all devices and all markets is now very impressive (9 out of 10). Developer support is very strong (9 out of 10) and despite some glitches along the way, it has built up an impressive army of users.

On the one hand, Estimote is just another BLE beacon manufacturer, but it is creating unique offerings (8 out of 10). Although it might disagree, Estimote appears particularly suited to developers and retail SMEs, connected home and personal location markets, but that is not to say that it won't become a major player with leading retail brands. The problem it faces is that it must go up against the likes of Zebra/Motorola, Cisco, Qualcomm/Gimbal, *etc.*, all of which have existing relationships and a broader offering in terms of technologies and service capabilities.

Its application enables the app developer/building owner to easily create an RF map of the building as well as location capabilities. The app also allows the owner to check each beacon and update its broadcast message individually. This is perfect for small-sized or a limited number of buildings, where the owner is happy to install and maintain devices through the app. What it now lacks is the large scale remote control, enabling IT departments to monitor and manage beacon networks across a large number of physical locations. This is what is required when it comes down to the nuts and bolts of deploying a system like this for a chain with hundreds of stores.

In terms of future potential (7 out of 10), many companies have talked about being the technology of choice for developers as and when this market takes off. The winner here not only benefits from the huge scale and thus revenue this would bring, but it would also very quickly become the leading provider of both physical and RF fingerprinting maps, something other companies will pay for. Although probably not part of its original plan, Estimote appears the company best placed to be this enabler. Certainly handset-based location will solve some of these problems, but the ability to also own most of the infrastructure is a big plus.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

##### **Market Share: 2.1%**

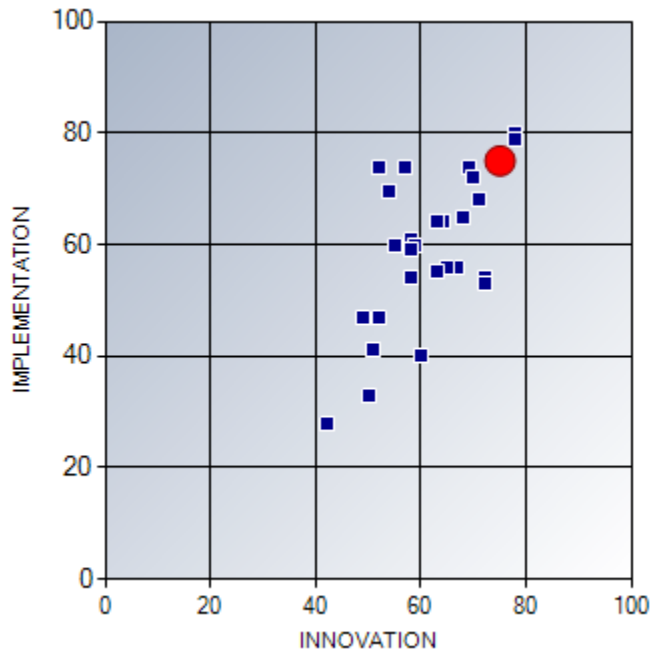
Estimote has been active in beacon development for a number of years and has overcome many of the initial problems associated with this technology. Its biggest problem in 2014 has been meeting developer demand. In 2015 it needs to shift to a more sustainable business model based on services, maintenance, *etc.* ABI Research is only attempting to track direct deployments by Estimote in this market share. Clearly by this time next year, the number of deployments using Estimote beacons will be in the tens of thousands, but many will be non-retail and those that are will be one to two beacon deployments for basic greeting, *etc.*

## Google

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 75**  
**Implementation: 75**  
**Overall: 75**  
**Rank: 3**



#### Implementation

Google scored highest of all companies on value chain support (20 out of 20), supporting location technologies, advertising, maps (13 out of 15), POS technology, local search, online retail pages, etc. Like Apple, Google is also thinking much more broadly, looking at connected home, wearables, IoT, etc., and trying to put the pieces in place to facilitate a new way to interact with connected objects that is instant and intuitive, e.g., Google’s “the physical web.” It is also active with Aisle411 on Project Tango, which could represent the next generation of indoor mapping and application creation. The ability to combine augmented reality, location and relevant content has been a dream for a number of years. It looks like we might finally be at a point where this will be possible as handsets advance over the next 2 years.

On mapping, it has recently launched its cartographer indoor backpacker, which uses SLAM technology to create maps in real-time as the user walks through the store. What is surprising about this is how cumbersome it seems. Companies today believe they are very close to launching handset-based SLAM technologies. Google has done this with Project Tango, Glass and the driverless car, releasing large or awkward trialing equipment to the public to illustrate what is coming next. It is difficult to believe that it does not have plans to offer SLAM technology in handsets in the near future. Google is also slowly addressing the area of inventory data/mapping. Within its content API for shopping, Google enables retail partners to update and manage information on their available inventory to facilitate hyperlocal product search. Local Inventory Ads is also now available to select retail partners, which it hopes will be the starting point for the next generation of local search and advertising.

Scoring Google on location accuracy is very difficult as it doesn't really have any real indoor location technology of note. Clearly, it has been working on its own RF-fingerprinting technology and already supports BLE beacons, but as stated in previous editions of this report, it looks as though it will support an open framework for handset OEMs to create their own indoor location technologies. With this in mind, what is more surprising is that we haven't seen the likes of Samsung, Sony, HTC, *etc.*, invest in their own solutions. Certainly, in 2 years time, high-end smartphones will support always-on ubiquitous location when augmented with BLE beacons. But all OEMs will have this and companies like these should be looking for differentiation. Samsung has been rumored to be in discussions with ShopCloud, an indoor location technology that can achieve sub-meter accuracy using sensor and data fusion. It will be interesting to see what happens over the next 12 months. One sensor fusion company has already been acquired and we expect to see many more, along with any company that can solve the issue of SLAM technology on the handset.

Google clearly has a huge market presence (10 out of 10). On the face of it, Google easily has the best implementation strategy with very few weaknesses. It currently falls down in partnerships (2 out of 10), privacy (5 out of 10), and accuracy (7 out of 10). Google is emerging as the bad guy of indoor location, from a retailer perspective, despite Apple attempting very similar strategies on mapping, *etc.* Large retailers are reluctant to work with Google, but they will inevitably find that they have to concede some ground to be able to have a presence in hyperlocal search. As with online, it is not enough to have a great webpage; retailers must also feature on search engines, to drive traffic.

Google has announced specific partnerships with leading retailers like Best Buy and Ikea. It has publicly announced over 10,000 indoor maps and is expected to make an update announcement soon, that will compare with Nokia HERE's 50,000. While a lot of these are public buildings like stadiums, airports, universities, public transit, shopping malls, *etc.*, it shows that building owners are willing to work with Google. There has also recently been an update of Google Maps/Search, which supports 3D panoramic views of building interiors.

### Innovation

Clearly Google is going to be very strong in omnichannel analytics (16 out of 20), advertising (20 out of 20), developer support (10 out of 10), and future potential (10 out of 10). Google's universal analytics platform (15 out of 20) extends its existing online capabilities and enables retailers to track users across multiple mediums (mobile, internet, *etc.*) using user IDs. It also enables them to combine a variety of different data sources (including CRM, social media, POS, in-store analytics, *etc.*) in one single source. This is a very powerful, omnichannel solution that can reach all types of retailers, big and small.

It receives average scores on power consumption (5 out of 10) and Z-direction (5 out of 10), as it does not offer particular solutions to these problems, like Apple and its coprocessor, but it no doubt will support these technologies.

Google offers developers a range of APIs and support around ubiquitous location, mapping, geofencing, advertising, analytics, *etc.*, (10 out of 10). Applications are the lifeblood of Google and provide the necessary location data, while also providing inventory for its advertising platform.

Google's uniqueness has dropped from last year (7 out of 10) as it has been usurped by Apple in terms of enabling new services and technologies. Many expected Google to use the I/O conference in 2014 as a way to respond and better Apple's iOS 8 announcements around indoor location, but this never really materialized and for the first time, Google is no longer considered the market leader. Could it be the Google will not own the indoor mapping, search and ultimately advertising potential? ABI Research said a number of years ago that if Google is approaching this market by working with retailers (which it still does), it will need to change how it accommodates retailers right to own and protect its own maps and inventory/customer/sales data. Apple on the other hand is designing with the consumer in mind, knowing that its sheer scale of users will force retailers to support its technology and services over time, *e.g.*, NFC payments.

It's hard to criticize Google as, much like Apple 2 years ago, its current deficits can easily be turned around, but unlike Apple, it is unclear if it will want to make these changes. What does Google actually offer a retailer today in terms of indoor location, other than mapping? On which its continued closed stance borders on arrogance.

Google seems to be of the opinion that once ubiquitous handset-based location becomes established, control will shift to the OS and handset vendors, and that is the time to strike. While this may be true of SMEs, ABI Research does not believe that is the case for large retailers. Mapping and indoor location tools are so widely and cheaply available, and with large retailers creating their own applications anyway, there is little incentive to work with Google. Perhaps SME is the core market Google is chasing, but it should still try to accommodate the large retailers, as this is where the big advertising money will be spent in the short to medium term. As it is, Google is allowing new threats to emerge through its lack of activity and lack of flexibility, while old threats like Apple are putting themselves in the perfect position to finally purge their devices of Google Search, much like they have attempted to do with Maps.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

##### **Market Share: 0.8%**

The lack of indoor location announcements at Google I/O 2014 was a surprise and it now appears to be waiting for ubiquitous handset-based location to become established, enabling control to shift to the OS and handset vendors. While this may be true of SMEs, ABI Research does not believe that is the case for large retailers. Mapping and indoor location tools are so widely and cheaply available, and with large retailers creating their own applications anyway, there is little incentive to work with Google. Perhaps SME is the core market Google is chasing, but it should still try to accommodate the large retailers, as this is where the big advertising money will be spent in the short to medium term. As it is, Google is allowing new threats to emerge through its lack of activity and lack of flexibility, while old threats like Apple are putting themselves in the perfect position to finally purge their devices of Google Search, much like they have attempted to do with Maps.

## Hillcrest Laboratories, Inc.

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

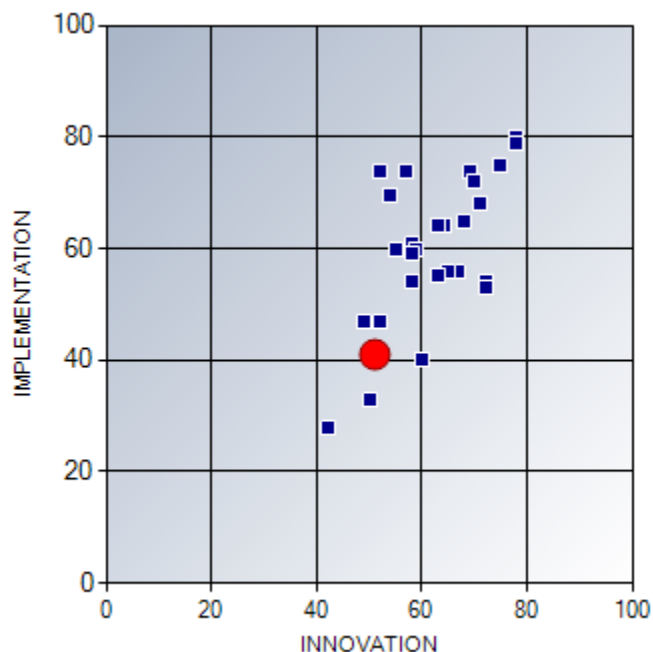
#### Summary

**Innovation: 51**

**Implementation: 41**

**Overall: 46.3**

**Rank: 26**



#### Implementation

Founded in 2001, Hillcrest has a long history in the sensor space, starting in smart TV. Since the launch of its Freespace MotionEngine Mobile, an embedded software solution that manages and enhances the combined performance of motion sensors commonly found in smartphones and tablets, it is starting to find success in this space, announcing contracts with OPPO and Coolpad, as well as a partnership with Bosch Sensortec on wearables (partnerships 6 out of 10). Hillcrest already has a very strong presence (5 out of 10) in non-smartphone markets, which in some ways makes it unsuitable for acquisition for a smartphone focused company, but it should be interesting to the sensor IC vendor market. However, recent acquisitions in this space has led to Hillcrest seeing an increase in interest from vendors that want a choice of solutions

One of Hillcrest's main selling points is its detailed, proprietary factory-testing and calibration process, which enables consistency across key data points, such as heading, linear acceleration, angular position, angular velocity, and cursor position, irrespective of sensors used. Hillcrest offers a dedicated context awareness library that uses information to understand how the device is being held and how the user is moving (accuracy 9 out of 10).

#### Innovation



Hillcrest's solution is particularly focused on low power consumption (9 out of 10), heading accuracy and understanding of all available sensors on the market. However, it is largely focused on sensor fusion and machine learning as opposed to a variety of hybrid technologies (3 out of 10).

Hillcrest has a very good reputation in the sensor market, with a number of major design wins in other markets, such as TV. It has only recently made the move to handsets with its Freespace MotionEngine for mobile. It is vital that it can start to incorporate other location technologies into its offering to be successful in this space.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

#### **Market Share: 0%**

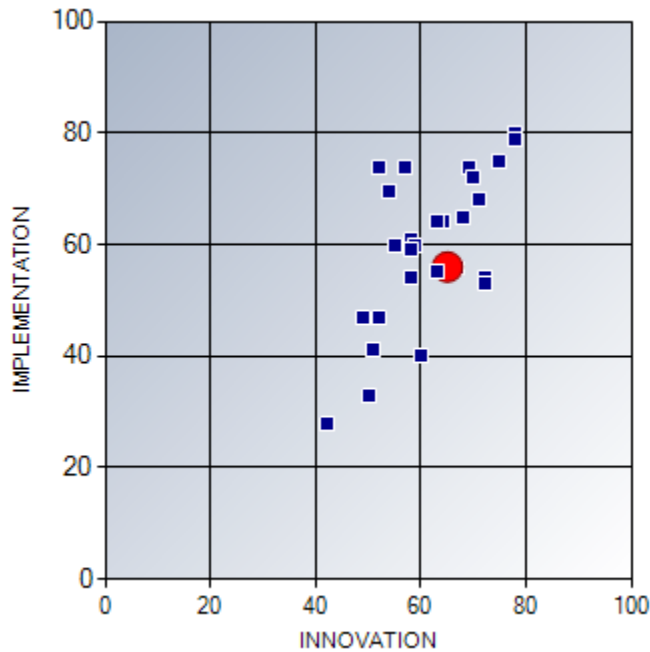
Millions of units of Hillcrest software is sold every year into a variety of markets, with partners such as LG, Roku, Atmel, Logitech, Kodak and Sony. Hillcrest has a great reputation in general but is perhaps not as focused on the indoor location aspect of sensor fusion as its competitors. Its ability to support all sensor types with its own performance lab is a big plus for handset OEMs, which will want multi-sourcing to ensure low ASPs and good performance in the short to medium term.

**indoo.rs**

**Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising**

**Summary**

**Innovation: 65**  
**Implementation: 56**  
**Overall: 60.7**  
**Rank: 16**



**Implementation**

While indoo.rs remains a small start-up, it continues to do the right things, and following InvenSense’s acquisition of Movea, it will hope to follow a similar path in the near future.

indoo.rs is starting to support more and more of the value chain, partnering with Kontakt.io and BEACONinside on iBeacons while also creating its own mapping (partnership with InMaps) and application tools, as exhibited in San Francisco Airport. It also supports analytics, geofencing and routing, which are available through its regularly updated SDK to developers.

It scores 10 out of 10 for its hybrid location solution based on combining ambient electromagnetic signals (Wi-Fi, BT, geomagnetic, etc.) with sensor and data fusion capabilities as well as machine learning algorithms. This gives it a score of 9 out of 10 for accuracy, with infrastructure giving the sub-5 meter accuracy solution the recalibration it needs over time. It scored 7 out of 10 for mapping as it supports measurement software to RF map building as part of larger database, with a view to extending this to SLAM technology in the future, on top of its partnerships.

The company still remains in the background and giving it 3 out of 10 for both presence and partnerships. The company is very flexible and is constantly looking at new ways of becoming a major player. It is not an out-and-out sensor fusion company like Movea was, which may limit acquisition potential from a major MEMS/IC vendor. However, as handset-based location comes to the fore, this would be a very interesting acquisition for a major handset vendor. Its partnerships with BLE beacon companies suggest it may look to also expand into the connected home, wearables, *etc.*

### Innovation

indoo.rs has a strong SDK offering to developers (10 out of 10) and is a relatively inexpensive solution to implement, scaling as developers grow (7 out of 10). It can locate across practically all smartphones (10 out of 10) and it can locate in the Z-direction (10 out of 10). The introduction of iBeacon support gives it a score of 15 out of 20 for combined location. Power consumption has always been at its core and is one of its key differentiators today (9 out of 10). It now has included analytics as part of its SDK (10 out of 20) and it will be interesting to see what new insight handset-based location can bring.

indoo.rs is a unique offering, in that it is looking to use sensor fusion to drive its indoor location business. This means that today it is ahead of the game as 6 and 9-axis sensor combinations have still to become commonplace in smartphones. The company has a great understanding of its position in the market and is aware that it can be the handset-based technology that drives developer adoption of indoor location, passive mapping and RF fingerprinting. It will be interesting if it can survive on the funding it has recently received long enough to either make it on its own or be acquired.

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0%

Interestingly indoo.rs is collaborating with beacon developers for deployments, but ultimately it is a technology provider and thus will not feature in the market share. where it can have a major impact is in areas around data fusion and crowd sourced maps and RF mapping, which will be very valuable in the future.

## IndoorAtlas

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

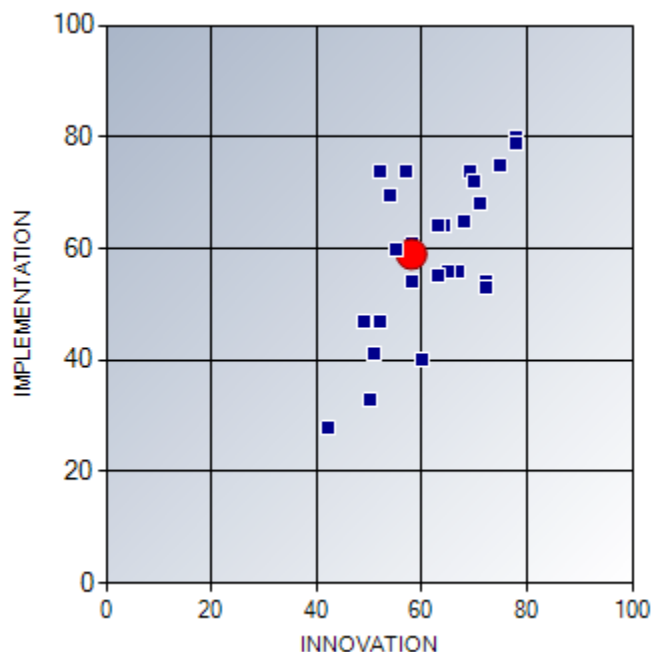
#### Summary

**Innovation: 58**

**Implementation: 59**

**Overall: 58.5**

**Rank: 20**



#### Implementation

Although IndoorAtlas was only founded in 2012, it has been spun out of years of research into robotic navigation indoors, based on utilizing magnetic variations that affect a compass, to navigate. Today, the company is very much focused on optimizing and testing the location technology, which limits its overall value chain score. However, the investment from Baidu will give it an opportunity for its technology to be installed and used across a huge range of applications and an estimated 1.34 billion subscribers (10 out of 20). While, the system is primarily based on utilizing magnetic fields, the technology can also take advantage of other sensors as well as other handset based technologies (7 out of 10). IndoorAtlas believes that once a building has been mapped correctly, it can achieve consistent accuracies of 3 meters, which makes it the best standalone technology available today. The technology has been criticized by detractors as suffering from interference in areas where there are moving large metal object, such as shopping trolleys. IndoorAtlas has designed its approach so that tis map can be updated with any major structural changes (new layouts, etc.), but can also accommodate interference once a potential problem is known, e.g., trolleys. This will still need to be proven in the real world and does raise potential questions around the technology.

Magnetic field mapping is an inherent part of the offering (5 out of 15) but it does not currently undertake physical mapping of a building or looking at incorporating inventory data as yet. The partnership with Baidu (7 out of 10), which is investing US \$10 million in the company, obviously has the potential to be very important and has come at a crucial stage of development. The company has also developed a large number of developers and currently has thousands of buildings mapped. It is also winning business outside of consumer applications, with Metso, a Finnish company with 30,000 employees, using its technology to help staff navigate large, complex buildings. Market presence remains relatively low (4 out of 10), but this should change over the next 2 years.

### Innovation

Today the company has no analytics (0 out of 20) or advertising (0 out of 10) capabilities of note, and only supports handset-based location (10 out of 20). Although magnetometers are still not commonplace, its reach with Baidu gives it (8 out of 10). The solution is very low cost, requiring only a firmware upgrade at the handset level (9 out of 10), and it is unsure as yet what pricing model to use, that will enable developers to use the technology while still generating revenue.

Certainly the technology is unique today (10 out of 10) and its future potential is now very strong (8 out of 10). The fear with many start-ups like this is that although the technology is theoretically very impressive, there are more doubts raised as the issue of magnetic field interference is not as studied and understood as say, Wi-Fi. However, the investment from Baidu not only gives it a major cash injection but is a big vote of confidence that should encourage others to also look to leverage this technology. As the market moves increasingly to hybrid approaches, magnetic field location could become as important as sensor fusion in filling in the gaps, enabling ubiquitous location.

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0%

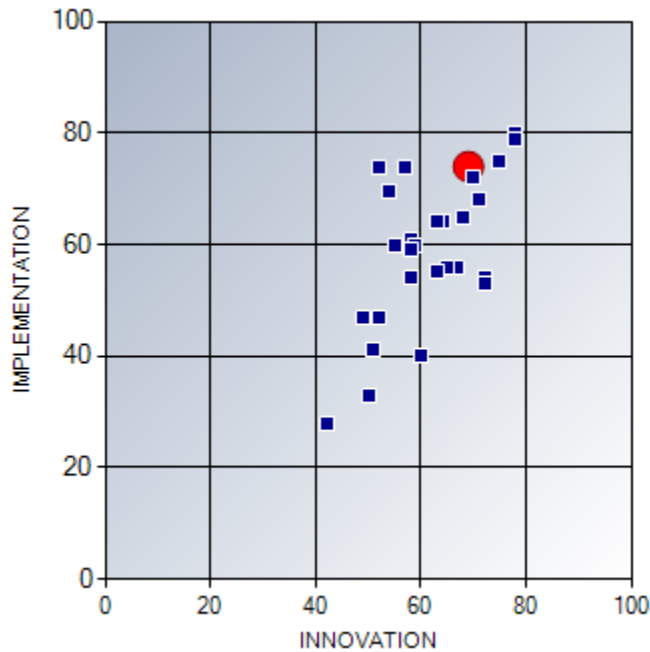
IndoorAtlas is currently undergoing a number of trials, while the Baidu agreement will open up access to billions of handsets. The company has made a major jump in a very short space of time. It now has the necessary backing to become a major disruptor in this space, and the financial backing from Baidu to protect its IP around magnetic fields. We can expect to see some official announcements in 2015, but it is perhaps at the handset level where it could have the most impact, enabling third party applications to build services without the authorization of the retailer.

## Insiteo

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 69**  
**Implementation: 74**  
**Overall: 71.5**  
**Rank: 4**



#### Implementation

Insiteo is one of the leading members in a band of French companies (that also includes SES) that are driving adoption of indoor location with major retailers and public venues. It has already has a number of small contract wins and trials, and is about to move to the next level with nationwide roll-outs at major retail chains.

Insiteo is moving up the value chain (13 out of 20) supporting all aspects indoor location, mapping analytics and application development, while also looking at the broader retail technology market. In France, electronic shelf labels are a huge trend that is set to also expand worldwide. Insiteo is working with SES and Pricer in France to integrate their technologies and services successfully. This will combine customer location and information, with product location and information, creating a way for consumers to interact with brands *via* their smartphone, as well as driving personalized advertising and dynamic pricing. This could be one of the next major trends in retail technology and Insiteo is now very well placed to benefit. As a result, it is capturing all 3 aspects of indoor mapping (11 out of 15).

Insiteo scores well for its hybrid approach (10 out of 10), supporting handset-based and infrastructure-based Wi-Fi, as well as BLE and indoor GNSS. It remains one of the most accurate solutions with the ability to deploy low-cost beacons to improve accuracy (8 out of 10) for Wi-Fi with the development of GPS beacons giving it a future evolution path. Insiteo has stated it can achieve 3 m accuracy with far fewer beacons than other solutions. It also has a strong privacy policy (8 out of 10) currently insisting on an active implementation where the user is aware they are being tracked, although it has the capability to support passive tracking.

Insiteo's market presence is growing in its native France and its partnership with ESL vendors could be key to future international growth. It still remains a small player, but ABI Research believes it is about to become the major indoor location company in France. It does appear that its work on indoor GNSS with the European Union may not be a core focus in the short to medium term, but it illustrates the company's desire to embrace the latest technological innovations.

### Innovation

Insiteo's analytics capabilities (12 out of 20) will be significantly boosted by integration with ESL, giving key dynamic data on product placement and inventory. Insiteo is a handset-based location technology, but its move into BLE beacons gives it a combined solution and the ability to win business today (15 out of 20).

Power consumption remains comparable with other start-ups, but is not optimized in the same way as the GPS IC vendors. Insiteo is also one of the few handset-based companies that can offer developers an Android and iOS SDK for its technology, but this will change rapidly as Android adopts its own standards on BLE beacons.

Insiteo's uniqueness comes from its position as a successful handset-based technology based in and initially focused on France. Major retailers there are embracing indoor location for application, in-store search and staff product picking, meaning it is in the right place at the right time. As mentioned elsewhere ESL is about to become a major trend in worldwide retail technology and Insiteo is well placed to benefit from this.

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0.3%

Insiteo's uniqueness comes from its position as a successful handset-based technology based in and initially focused on France. Major retailers there are embracing indoor location for application, in-store search and staff product picking, meaning it is in the right place at the right time. As mentioned elsewhere ESL is about to become a major trend in worldwide retail technology and Insiteo is well placed to benefit from this.

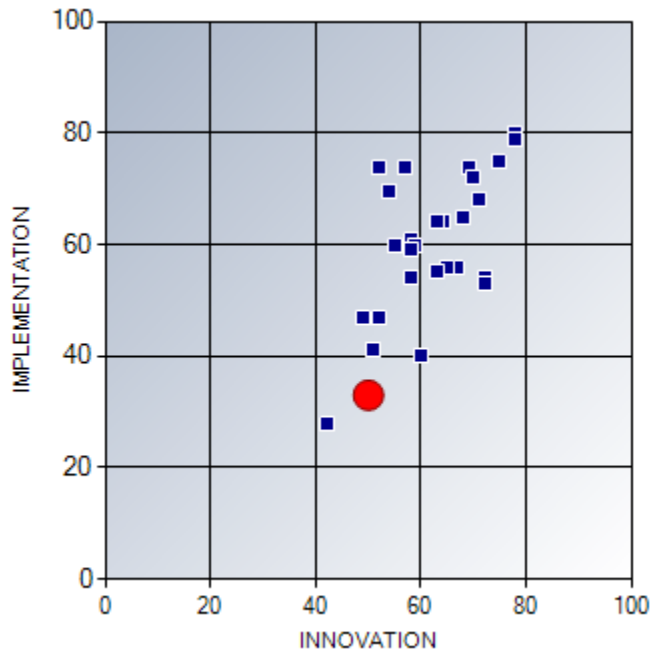
It is now positioned to have a lot of success in France. It will be interesting if it can extend this worldwide. Certainly some of the brands it works with today are global and can facilitate this.

## InvisiTrack

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 50**  
**Implementation: 33**  
**Overall: 42.4**  
**Rank: 27**



#### Implementation

InvisiTrack has remained in the “huge potential start-up” category for probably longer than it had hoped. Theoretically, the technology looks very impressive, with huge benefits *versus* limited costs. While the company talks about discussions with carriers, infrastructure vendors, *etc.*, it has failed to close a significant deal.

Its PoLTE technology is built on top of basic location standards defined in LPPe 1.0. The proposed LTE coverage plan does not allow for significant overlap, which in turn affects location accuracy. However, InvisiTrack’s technology extends the range of an LTE small/macrocell (hybrid 6 out of 10) using software-based processing gain algorithms, which enable it to enhance the received signals to better remove the effects of multipath and other location impairments to achieve sub-3 meter accuracy in all 3 axes with a sub-1 second latency (9 out of 10). When deployed specifically for indoor location applications, such as aisle level retail, it can achieve sub-meter accuracy. Location calculations can be completely passive using an SLP server, or can be implemented in a handset-based implementation. It is always difficult to accurately compare technologies but InvisiTrack claims that to achieve the same level of performance over a 150,000 square foot building would require 160 Wi-Fi access points *versus* 10 LTE transmitters/beacons. The company has a strong privacy policy (8 out of 10), but as yet it does not have a major presence (3 out of 10) or partnerships in place (2 out of 10).

#### Innovation



Like other start-ups, it is greatly affected by its lack of analytics (0 out of 20), advertising (0 out of 10), or developer support (0 out of 10). It scores 10 out of 10 for implementation costs, as its technology would merely require a software upgrade of infrastructure and handhelds, supporting its own location server. It also scores 10 out of 10 for penetration as it can reach any device (including non-smartphones) on the network. It also received 10 out of 10 for Z-direction location.

The company scores 8 out of 10 for its unique approach to this market and 7 out of 10 for future potential. The company has 11 related patents and its technology can offer ubiquitous indoor (sub-3 meter) and outdoor (sub-25 meter) high accuracy location. In Release 9 of the LTE standard, the RSPB ranging calculation has been left open to innovation. To deploy this technology would only require a software upgrade of this.

The company has largely stood still over the past 12 months, which in this market must be considered a step backwards. In a year when many companies' scores have increased significantly as they look to grow, there is now a fear that InvisiTrack is just too small to make its technology a success. It is very difficult to compete against major technology and infrastructure vendors, who also have their own LTE technologies. As is often the case, it is not the best that wins but the one with most power. It is absolutely vital that InvisiTrack wins a major carrier/infrastructure vendor contract this year, or it will have to start pivoting and looking at targeting individual companies in indoor location, M2M, etc.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

#### **Market Share: 0%**

InvisiTrack has remained on the potentially disrupting start-up list for a little too long. It really needs to align itself with a major carrier or network infrastructure provider soon, or it will fail to achieve the promise of the technology. The longer it goes without this the more doubt will be raised about the true capabilities of the technology. The year 2015 is make or break in terms of this becoming a widely used technology.

## iPosi

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

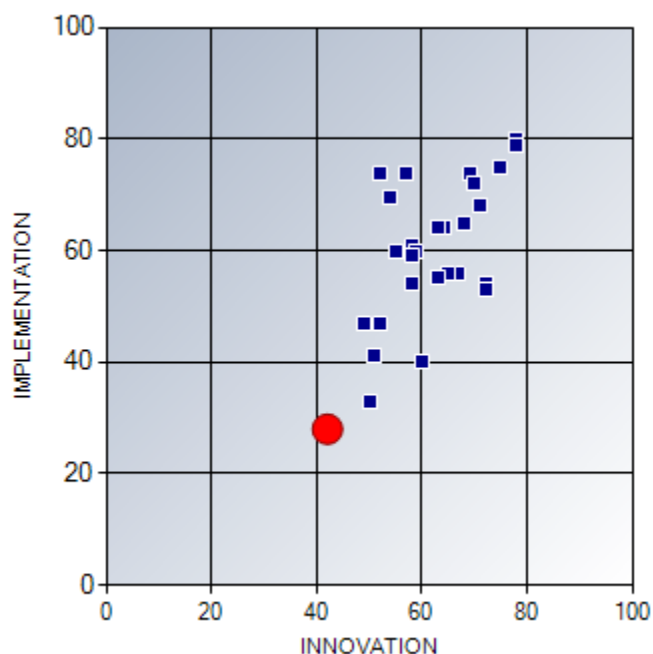
#### Summary

**Innovation: 42**

**Implementation: 28**

**Overall: 35.7**

**Rank: 28**



#### Implementation

iPosi is a company that has recently come out of stealth mode and offers a unique indoor location technology, which today is focused on locating femtocells/small cells indoors, but which can be extended to support location of devices using the network. iPosi has developed a novel software GPS/GNSS solution that lowers overall cost, while also incorporating network synchronization protocols. iPosi’s solution uses a more time error-tolerant deployment of PTP, as well as SyncE, and supports future version packet standard protocols to deliver its unique, patented GPS assistance solution that originates from its own managed-in-the-cloud head-end servers. It is developing in-building grade coverage which deals with signal attenuation for femtocells and other stationary, IP-connected host devices. This enables a reliable position and on-going sync solution that requires less CAPEX expenses such as grandmasters for network service providers while reducing the need for continuous network traffic thus lowering OPEX for carriers.

It scores 28 for implementation, which has been significantly lowered by having map support (0 out of 10), publicly announced partnerships (2 out of 10), or market presence (3 out of 10) at this stage. However, its technology works on the basis of it operating and managing its own location server, which gives it a value chain support of 7 out of 20. As the company is focused on the location of infrastructure at this stage, rather than devices on the network, it received an average score of 5 out of 10 for accuracy and 8 out of 10 for privacy. This first problem will need to be solved both for mandates like NG911 as well as maintaining performance and control of small cells, given how mobile these devices can be.

### Innovation

Similarly, iPosi's innovation score is greatly affected by its lack of analytics (0 out of 20), advertising (0 out of 10), and developer support (0 out of 10). It scores 9 out of 10 for implementation costs as it is supporting its own cloud-based servers. It scores 10 out of 10 for penetration as it can reach any device (including non-smartphones) on the network. As its handset location technology is not available it received average scores for Z-direction and power.

iPosi received 8 out of 10 for uniqueness and 7 out of 10 for future potential. The problem of location femtocells and small cells is still a major issue that has yet to be solved. iPosi provides a highly accurate low-cost solution from a company with a strong history in infrastructure design and standardization. If it can win major contracts with carriers on infrastructure location, it is in a great position to then extend its solution to also support handset-based location. Small cells, carrier Wi-Fi, and HetNets are expected to significantly change the face of the indoor location market, and iPosi is in a great position to benefit from this.

iPosi is another emerging start-up that hasn't publicly made up much ground over the last 12 months. However, it is not as precarious as others as it can play a longer game, given the prolonged rollouts of small cells and HetNets. It does not need to win big now, but it would certainly be a plus.

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0%

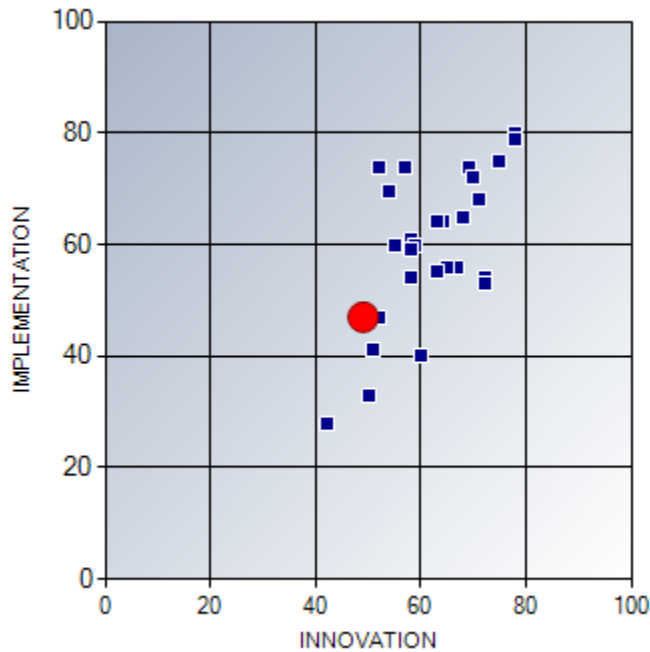
iPosi continues to grow and is now becoming accepted as the most effective way of locating small cells indoors, whether it is for mandates or network optimization and control purposes. ABI Research believes 2015 could be a big year for the company and it may finally make some big partner announcements as the small cell market begins in earnest.

## NextNav LLC

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 49**  
**Implementation: 47**  
**Overall: 48**  
**Rank: 25**



#### Implementation

NextNav is now emerging as an important future player in the North American location market, with many of the initial fears around the technology starting to dissipate. Its market presence (5 out of 10) is growing and moving into the mainstream. One area where it has improved significantly is on partnerships (7 out of 10), having received US\$50 million in funding, led by Columbia Capital, followed by a Series D US\$70 million round of funding in June 2014. It is also at an advanced stage of development with Broadcom, CSR and other GPS IC vendors, as well as recently announcing a partnership with TCS. This alleviates fears of the company going bankrupt as infrastructure costs mount as well as concerns about spectrum interference, which ultimately undid LightSquared in 2012. What it now lacks is a major win with carriers, E911 approval and/or approval for use on the new first-responder FirstNet network, which may ultimately be where it is best suited.

It retains control of the value chain (7 out of 10) by developing the infrastructure itself, working with GPS IC vendors on firmware upgrades, and working with the FCC to gain approval for broadcast in the contentious 902 to 928 MHz band, where it has removed interference fears by being limited to 4 MHz beyond 920 MHz. NextNav supplements its proprietary technology with existing cellular location infrastructure and GPS ICs (12 out of 10), and is believed to be investing in indoor location capabilities. This ownership of the infrastructure and thus the communications channel, also gives it a very high security score (9 out of 10).

Today NextNav's solution is not high precision (6 out of 10), but it is ubiquitous at a city level. The solution can achieve horizontal accuracy of 20 meters to 25 meters, with the potential to support vertical accuracy of 1 meter to 2 meters with the introduction of pressure sensors. It can achieve a location fix within 5 seconds through the synchronized nature of the network, but in the recent SCRIC trials it achieved an average of approximately 27 seconds. As mentioned, it is believed to be working on accurate indoor location solutions (5 out of 10). At the recent SCRIC results, NextNav failed to live up to some of its own results, but as things stand today, its solution has outperformed the other two main competitors in the first round of trials; Qualcomm and Polaris Wireless. A lot will change for the next round of tests, but it is certainly a strong position to be in at this stage.

In terms of future potential (9 out of 10), it is clear that the company still has a long way to go to realize its original aims, but it is not only rising to each new challenge, but in many cases surpassing it with vigor. Questions still persist about the realities of rolling out such a large network, maintaining consistent performance, without introducing any interference issues in adjacent bands. The major danger to NextNav is the emergence of a technology that can match or beat its performance, without incurring huge costs. Even though it can absorb the infrastructure costs itself, there is still a hardware cost at the handset level. GPS companies may be supporting NextNav today, but to what extent? It is one thing to widen the RF front-end to include NextNav spectrum, ensuring that you are future proofed and ready should NextNav become important. It is another to absorb the additional size and costs associated with the technology. It looks as though the technology is a great fit for the FirstNet network, which would give a platform to go and win other business. ABI Research believes that competitors did not show their full hand in the first round of CSRIC tests for NG911, with others still to enter the fray. This is an area that will be far more competitive for NextNav.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

##### **Market Share: 0%**

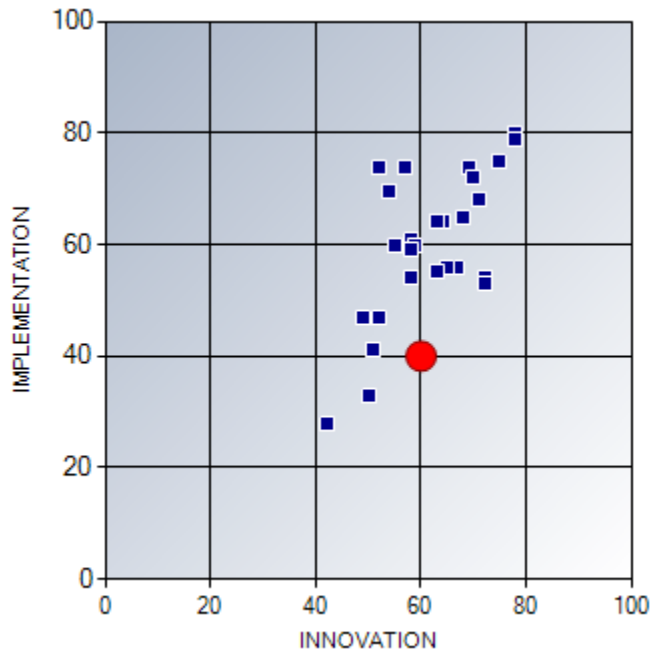
The level of investment in NextNav continues to surprise and is essential to its success. It has overcome many of the potential roadblocks around spectrum and is now making the right kinds of partnerships in the industry. It is unlikely we will see anything major from NextNav in 2015, as it is playing a long term game. However, if it does become at least one of the technologies approved for future E911 mandates it will have a knock-on effect in the retail space.

## Path Intelligence

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 60**  
**Implementation: 40**  
**Overall: 51**  
**Rank: 23**



#### Implementation

Path Intelligence has evolved to become more of a retail analytics company, competing with camera technology, as opposed to an indoor location company. Having experienced privacy scares in the past it has tightened up its offering significantly (8 out of 10), focusing solely on passive, anonymous analytics with no attempts to move into customer facing applications, services or advertising. As a result, it does not own a significant portion of the overall value chain, but it does have a complete solution it can offer to retailers and in particular shopping malls (8 out of 20). It has stated that it can achieve accuracy of 1 meter to 2 meters (7 out of 10) and most importantly is not affected by Apple’s recent Wi-Fi MAC address issues as it also uses cellular and BLE.

One of the major benefits of its technology is the ability to reach all devices, and thus a huge percentage of footfall. The company does not promote its deployments but is one of the first to move into hundreds, with some strong partnerships (6 out of 10) with leading shopping malls in Europe and to a lesser extent North America.

#### Innovation

Path Intelligence is very strong on analytics services (15 out of 20), offering a wide variety of reports and services that target different business. As a cellular technology, it has very high penetration capabilities (10 out of 10) and supports floor-level location (10 out of 10). Path Intelligence has traditionally been known as a relatively expensive technology to implement, but today it is comparable to other indoor location technologies, in terms of monthly fees (6 out of 10).

Path Intelligence scored 6 for both uniqueness and future potential. The company has decided to take on the camera analytics companies with a technology that can bring far more benefits in terms of analysis. This market is worth approximately US\$300 million a year and growing, with most leading companies scrambling into BLE and indoor location to remain competitive. Today, this model is proving effective and its use of cellular technology is a big plus. However, as small cells and HetNets become commonplace in large venues like shopping malls, it is going to face significant competition. Similarly, while its stance of privacy is admirable, it will come up against companies with strong advertising and customer service capabilities, on top of anonymous analytics. Despite this, Path Intelligence has already carved out a significant business and is well placed to have continued success. It is unlikely to become a market leader, but it can be a successful company over a longer period of time.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

#### **Market Share: 0.8%**

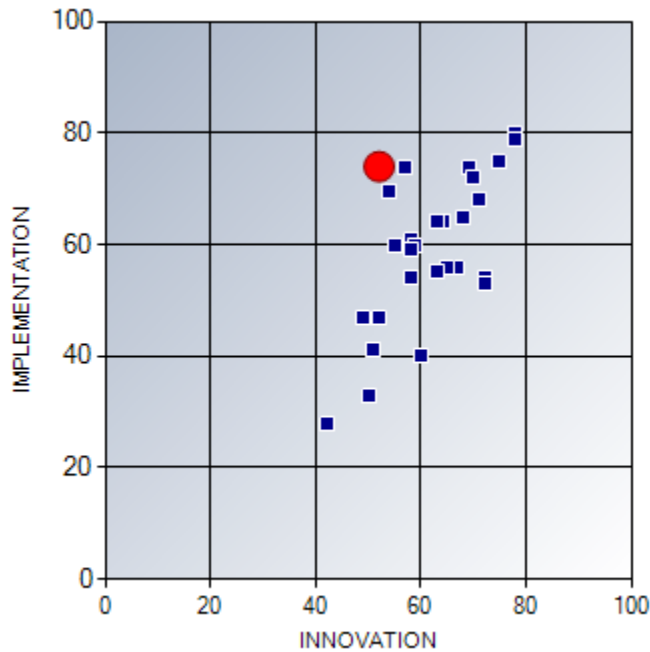
Path Intelligence is now establishing itself as an alternative to camera analytics and people-counting technology and does not appear to be chasing the high-accuracy retail market. It has a strong presence in shopping malls and is becoming a leading provider of general indicators on the health of the retail market. Its refocus on privacy has also been a big plus. The company looks like it can carve out a successful business without becoming a major powerhouse in this space.

**Point Inside**

**Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising**

**Summary**

**Innovation: 52**  
**Implementation: 74**  
**Overall: 64**  
**Rank: 10**



**Implementation**

Through its StoreMode offering, Point Inside provides retailers with a complete solution, including dynamic maps (10 out of 10), inventory integration/product search, navigation and analytics and advertising, giving it a value chain score of 12 out of 20; what it does lack surprisingly is an indoor location technology. Although Point Inside is believed to be working on its own indoor location solution, most likely based on BLE beacons, it currently partners with other companies, and as such receives similar location performance scores on accuracy and hybrid approach.

Point Inside initially established a number of partnerships and is part of the Cisco/Qualcomm ecosystem effort. However, it has made most progress on its own with Meijer, Lowe’s and one large unnamed retailer, with its Store Mode offering now used in 5,000 stores (8 out of 10). This makes it one of the most successful early start-ups in this space today.

Point Inside is attempting to move into the limelight and increase market presence (6 out of 10), announcing 1,690% revenue growth since 2010, 10,000 mapped buildings, 5,000 in-store search engines, with its platform used by over 100 million devices. It is also one of the first companies to publish long term results that illustrate the positive impact of an indoor location shopping application for retailers. Its product Search function was A/B tested over a year, and across over 1 million shopping experiences. The trial used two apps, one with Point Inside’s technology/services and one without. The results were impressive, with 5 times more use of Point Inside’s application, 4 times more coupons clipped, and an average increase in basket size of 5% to 10%. This is in a market where a 1% increase is significant.



## Innovation

Point Inside has a very rounded offering that covers both analytics (12 out of 20) and advertising (9 out of 10), although it should be pointed out that analytics is not a particular focus for the company. Point Inside has previously developed its own indoor location technologies, and is expected to announce a new technology and, therefore, receives average scores for combined location, power, and penetration. It is difficult to determine exact costs for its solution but it does not appear to be an expensive option (5 out of 10).

Point Inside scores 7 out of 10 for uniqueness. Point Inside has a very strong offering to retailers, ticking a lot of boxes, as well as having a flagship example in Meijer and now Lowe's. What it has hit on before most others is in the importance of product search, which is now its main differentiator *versus* others that can do indoor location and analytics. By taking the time to map out the location of products within a store, it can accurately support high value services like product search, while also becoming tightly integrated with the retailer.

In terms of future potential it scored 7 out of 10. The company claims to not have received funding, but ABI Research was under the impression that it had received US\$3.2 million in 2012. It has openly stated that it is looking to partner on sales and data management to help the company grow. It may be that the company is now looking to be acquired, outlining this need to encourage companies that can meet this. The company has stated that it is also looking to expand into large regional markets both with existing partners as well as establishing similar relationships in new countries. ABI Research placed Point Inside as one of the three application/service companies, along with Aisle411 and the recently acquired shopkick, that looks the most likely to be a success/acquired.

## Market Share: Retail Indoor Location, Analytics, and Advertising

### Market Share: 26.1%

Point Inside is releasing a lot of data about its deployments in an effort to drive awareness and possibly an acquisition. Anecdotally, it is hard to see evidence of 5,000 deployments but Point Inside is a great company that has moved and expanded from the very start and it is certainly one of the best placed to start hitting these kinds of deployment numbers.

Along with shopkick and Aisle411 it has become the initial leaders in the retail application market. It has the potential to become the go-to company on in-store search, which will become a hugely profitable area in the future. Even advertising may not have the same ability to directly influence shopping basket size as in-store search, and it is now one of the most sought-after applications for retail, with or without location technology.

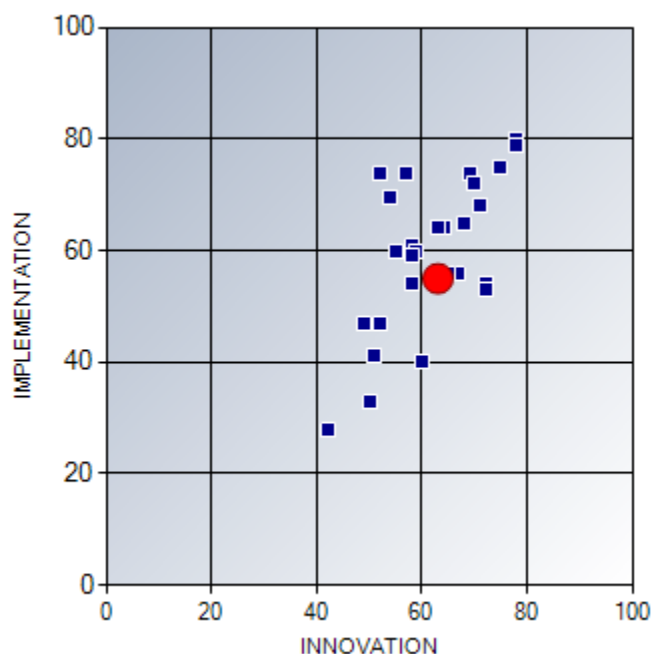
ABI Research believes that over the next year, Point Inside will continue to evolve away from the traditional mapping/location market, and will become increasingly integrated into the back-end, tying its data with POS, loyalty, CRM, fulfillment, staff management, *etc.* To do this, it will need to integrate/partner with the major CRM/BI providers like SAP, IBM, *etc.* ABI Research also believes that it will be one of the first companies to go international with its offering in 2015.

## Pole Star

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 63**  
**Implementation: 55**  
**Overall: 59.1**  
**Rank: 19**



#### Implementation

The company's technology is already used by Charles de Gaulle Airport, a number of French shopping malls, and a handful of similarly sized buildings in the United States (6 out of 10). It is now establishing itself as a very suitable technology for events, as it can be deployed very quickly and at low cost over very large areas, e.g., Mobile World Congress in Barcelona. These same benefits have also enabled it to have a lot of success in airports and may become a leading player in this space also. Despite not supporting some key elements of the overall value chain (8 out of 20), it has a self-contained solution that will meet the needs of a lot of its customers. Pole Star's biggest difficulty will be achieving market presence (5) given the large number of infrastructure-based Wi-Fi solutions available and Apple's decision to randomize MAC addresses. What it definitely does have in its favor is low cost Wi-Fi infrastructure and BLE integration, which puts it ahead of a lot of access point vendors also competing in this space.

It has strong partnerships with Visioglobe and Micello for mapping (5 out of 10). It originally offered a Wi-Fi-based infrastructure solution. Today its NAO Cloud service platform also supports GPS, BLE, sensor fusion, and crowdsourced RF mapping, giving it a hybrid score of 8 out of 10. Using proprietary algorithms, this solution can achieve 2 meter to 5 meter accuracy at a much lower cost than more traditional Wi-Fi infrastructure providers, giving it an accuracy score of 7 out of 10.

#### Innovation

Pole Star offers developers a relatively rich cloud-based SDK in NAO Campus (7 out of 10). Pole Star has added analytics to its current offering (10 out of 20). Clearly low implementation cost is one of its major selling point (8 out of 10) as well as Z-direction location (10 out of 10). As discussed it is very much a combined location technology provider (20 out of 20), and it has also been involved in the development of UWB indoor location technologies.

There are now a lot of companies that are like Pole Star but may not have the same low cost capabilities, The problem is that it is often lost in this sea of providers, making it difficult to stand-out or be unique (6 out of 10). Despite this, the company still has strong future potential (7 out of 10), especially as a specialist in technologies for large buildings that already feature Wi-Fi, such as airports and convention centers.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

#### **Market Share: 0.3%**

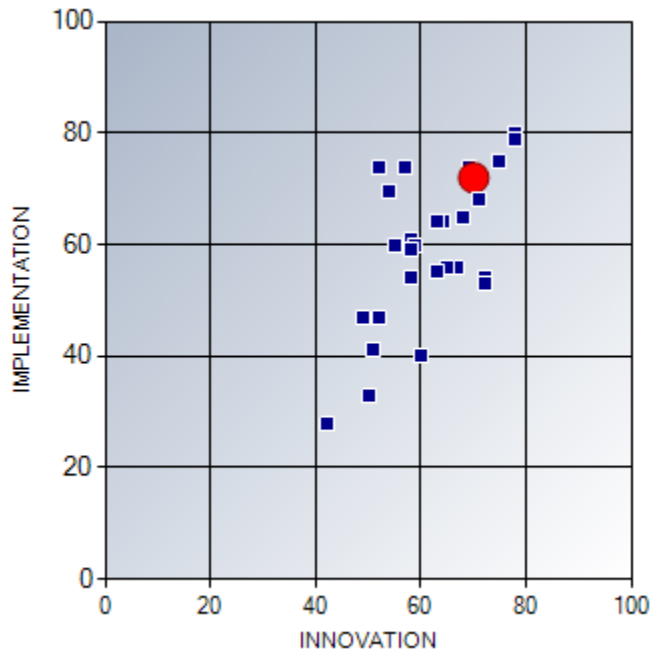
Pole Star is now establishing itself as a leading provider of low cost, easily deployed technology for very large venues. This makes it harder to grow rapidly as often each venue is a one-off rather than part of a large chain. The biggest issue facing the company is the direct competition it will face from handset vendors like Apple and Google. Developer support is vital and it needs to continue to evolve its NAO platform (which offers features such as geofencing and crowdsourced, RF mapping) to further optimize it to enable developers to easily create applications for indoor environments, including SLAM technologies. It should also look at its ubiquitous location capabilities, as this will become increasingly important for analytics and new application opportunities.

## Qualcomm Inc

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 70**  
**Implementation: 72**  
**Overall: 71**  
**Rank: 5**



#### Implementation

Over the past 12 months Qualcomm has continued to do what it does best, location technologies. It has spun out Gimbal, but Qualcomm remains the single largest investor (but non-controlling interest) in what was essentially its old retail Solutions group, with third parties such as Zebra Technologies are the majority shareholders in this initiative. Both entities are being assessed conjointly, but depending on the next 12 months, it may well be that these have separate rankings next year.

Qualcomm has refocused its efforts on LTE direct, where initial carrier trials appear to be successful, while Facebook has publicly talked about using the technology. Furthermore, it has taken its R&D into LED/VLC and is now working with Acuity Brands on its new Lumicast technology. What is impressive here is how Qualcomm is bringing these technologies to market so quickly. Both were not expect to begin impacting the market for at least another 2 years. While this may still be the case due to the traditional retail 2 to 3 year adoption cycle, it is still impressive that they can display this technology today.

As a result of these new technologies, Qualcomm scores full marks for hybrid approach (10 out of 10) and accuracy (10 out of 10). Qualcomm's accuracy is also based on optimization of its Wi-Fi ICs in handsets and access points, which we can expect to see come to market second half of next year.

It scores 5 out of 15 for map support (0 out of 10), and 12 out of 20 for value chain support. Qualcomm was never in the business of attempting to own the full stack. While it has formed partnerships with indoor location start-ups, not unlike, say, Motorola, it does not have a solid offering to sell directly to retailers. Its IZat platform is targeted at carriers, OS and handset vendors. Even in the case of Lumicast, it will be down to Acuity to build a complete offer to retailers, not Qualcomm. As a result, it unfairly receives low scores here, as it is one of the few companies that truly has a major part to play at the handset level.

The company is very strong on device penetration through its Snapdragon platform, has formed good strategic partnerships in the indoor space (8 out of 10), and does not face the same privacy issues as its main competitors (8 out of 10).

### **Innovation**

Qualcomm rightly has the highest innovation score of 77. While many have scored well for moving to BLE beacons *via* hardware partners, it has already spun out its beacon business and is concentrating on next gen Wi-Fi, LED and LTE technologies. Again Qualcomm's final score is affected by not support analytics and advertising solutions, but it should be pointed out the LED direct will be a major technology in both of these areas if it is adopted by carriers.

Its scores are high for implementation cost (8 out of 10), Z-direction (10 out of 10), future potential (9 out of 10), and uniqueness (9 out of 10). Qualcomm's unique advantage is that it can combine the existing installed base of access points and partner relationships with a chipset and handset presence as well as carrier relationships. This will help create the first truly ubiquitous accurate indoor and outdoor location technology, combining cellular, Wi-Fi, indoor, and MEMS.

## Ruckus Wireless

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

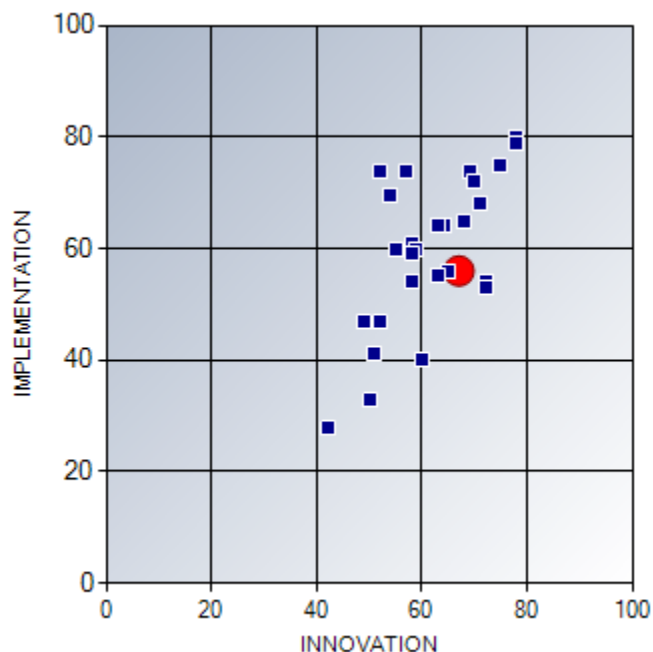
#### Summary

**Innovation: 67**

**Implementation: 56**

**Overall: 61.7**

**Rank: 15**



#### Implementation

Prior to Ruckus's acquisition, YFind had already developed a relatively mature offering (12 out of 20), which went beyond handset-based Wi-Fi location (hybrid location: 5 out of 10) to include analytics, geofencing, and advertising; what Ruckus has brought is a strong location backbone with its SPoT technology, using AOA algorithms to offer one of the highest accuracy Wi-Fi location systems (8 out of 10) available today.

It is very much a Wi-Fi based solution and with recent changes to iOS and Android on MAC addresses this is now becoming a major problem. Ruckus has innovated on Wi-Fi, but it now needs to also look at other technologies like BLE beacons or handset based technologies, to fill in the gaps when a consumer is not using guest Wi-Fi.

Ruckus Wireless has growing presence in the retail Wi-Fi access point market and the acquisition gives it a readymade analytics and footfall platform (7 out of 10). However, Ruckus (or YFind, pre-acquisition) does not have a strong presence in the indoor or analytics space as yet (3 out of 10).

#### Innovation

Ruckus's Retail HQ platform makes it one of the more advanced providers of analytics (15 out of 20). Ruckus now has both an infrastructure and handset based technology but has yet to combine them commercially (12 out of 20). This also results in a strong penetration score of 8 out of 10. In terms of developer support, it does not appear to have available APIs or SDKs for developers, but YFind has worked with Spooki to develop solutions for retail branded applications. This also gives it a background in advertising applications (5 out of 10).

The solution is cloud-based, thus removing the costs of dedicated on-site location equipment, while also adopting a more progressive infrastructure model, wherein retailers pay a small flat monthly fee of US\$25 for the equipment and basic services (9 out of 10). The acquisition of YFind has also enabled it to develop SDKs and APIs for developers (7 out of 10). In turn this enables the retailer/building owner to work with any provider it likes.

Marking Ruckus Wireless's solution for uniqueness is difficult as it is certainly doing something new in terms of Wi-Fi location, but ultimately is just another infrastructure-based Wi-Fi provider. Ruckus Wireless scored 6 out of 10 for future potential. It does not have the same Wi-Fi access point market share as others, which will limit its potential for growth, but its low cost, high accuracy solution will mean that it is very suitable for certain verticals where guest access is key to the overall service.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

#### **Market Share: 0.3%**

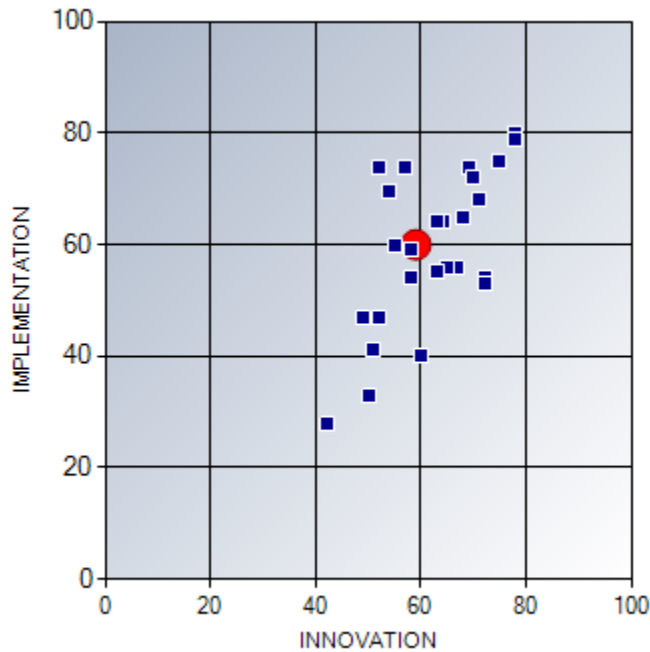
If they can combine Wi-Fi with another technology like BLE, it is suddenly back in the game again, and able to leverage the low cost Wi-Fi service where applicable. What many also forget is that indoor location is not an isolated system. Ultimately it needs to integrate with many other in-store technologies, in real-time. Wi-Fi is still a great way to do this, and with companies like Ruckus actively involved in supporting Wi-Fi enabled POS, kiosks, digital signage, inventory scanners, *etc.*, it is well placed to put Wi-Fi back in the forefront.

## SenionLab

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 59**  
**Implementation: 60**  
**Overall: 59.5**  
**Rank: 18**



#### Implementation

SenionLab is a European company with over 20 years’ experience in sensor fusion for the automotive and aerospace industries. With sensors now penetrating the cellular market it has moved to bring its experience to this market. Over the last 12 months SenionLab has extended its offering into Beacons as well as offering analytics, giving it a value chain support score of 12 out of 20 and a hybrid approach of 10 out of 10. What is interesting as that it is very easy to support BLE beacons now, but not detailed sensor fusion, which is why companies like SenionLab can have a big part to play. The company has formed partnerships with Micello and MapMkt from Brazil giving it a score of 5 out of 10. As mentioned last year, it has deployments in over 70 shopping malls with SingTel in Asia. It has also just received funding from Finnovia and its technology is being deployed in a nearby hospital and mall, which could be great proof of concept deployments for the company (6 out of 10). Its overall market presence remains very small (3 out of 10), even though it has quite a high building penetration in comparison to others in this space.

#### Innovation

As mentioned, SenionLab supports indoor location analytics (13 out of 20), and scores 15 out of 20 for hybrid technology, as it is very much focused on enabling future technologies. Power management is a key element of SenionLab’s offering (8 out of 10), but given low sensor penetration (4 out of 10), there has not been significant adoption of its developer API as of yet (6 out of 10).

#### Market Share: Retail Indoor Location, Analytics, and Advertising



**Market Share: 0.5%**

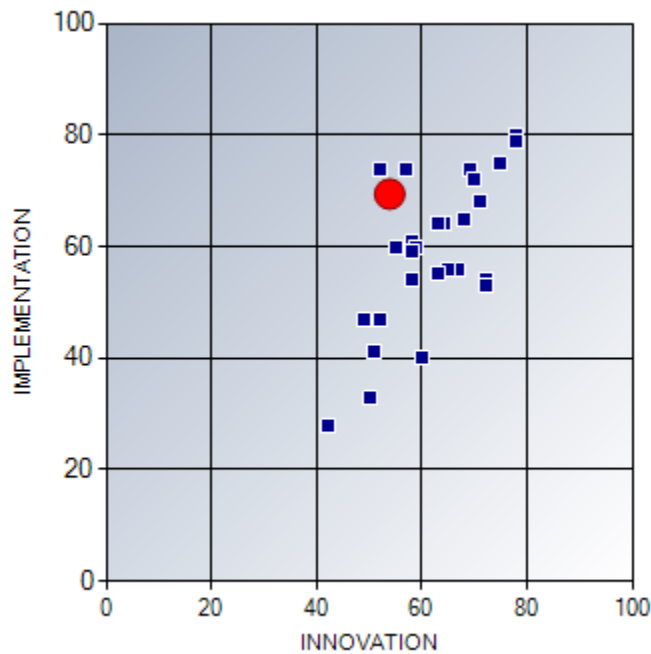
SenionLab has a lot of future potential, but does not appear to have capitalized on initial gains over the last 12 months. Certainly, this market is unlikely to really kick in for 2 years, but it is important that it can continue to grow while it waits for MEMs penetration to increase on handsets.

## SES Global

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 53.85**  
**Implementation: 69.41**  
**Overall: 62.1**  
**Rank: 14**



#### Implementation

Technically, electronic shelf displays are not used for indoor location. However, this market is starting to embrace NFC and BLE beacon technology that will bring these capabilities, while also enabling tight integration with inventory management, dynamic pricing and omnichannel marketing.

There are a number of companies active in this new and emerging space, making it difficult to cover all or identify one in particular. In the research analysis *Next Gen Retail: Electronic Shelf Labels* (AN-1661), ABI Research identified SES Global as one of the companies best placed to be a success in this space while also working with indoor location companies, however this competitive assessment is a broader review of the technology as a whole rather than one company, given how nascent the market it is, but also its potential value in the retail technologies space. Therefore this competitive assessment is also relevant to companies such as DisplayData (investment from Zebra Technologies), Pricer, Samsung, and Altierre, who are all actively supplying ESLs today.

ESL technology is still a very new phenomenon outside of mandated countries (France, Japan) and has traditionally been focused on ensuring price consistency. As such it is a small part of the overall value chain. The introduction of BLE and NFC provides a connection between the customer, the product and the internet/online. This suddenly makes it potentially a very important technology longer term. Most ESL vendors are considering NFC or BLE, but in reality we expect to see both implemented, particular after Apple has begun supporting NFC (8 out of 10). BLE beacons will give it sufficient accuracy to engage the customer with NFC giving the accuracy for some new services around accessing information, recipes, as well as automatic payment.

One of the core elements of ESL is the need to map both the shelf layout and where stock is located as part of the installation process. The added benefit is that this automatically creates a geo-map of the store and enables very tight inventory data integration and management, particularly when matched to POS data. From a store perspective this helps to prevent stock-outs and also respond to changing supply and demand of certain products, *i.e.*, dynamic pricing (15 out of 15). For indoor location it is the foundation of building physical maps, as well as layering in RF mapping and inventory.

### Innovation

Today ESL companies are not directly active in analytics from a customer perspective but they are key in linking the customer to the products, which is the foundation of advertising (10 out of 20). Indoor location companies are realizing this and forming partnerships with these companies to integrate this data to enhance their existing analytics offering (10 out of 20). As mentioned penetration is low today, but ABI Research has forecast that this market will approach US\$2 billion per year by 2019. The technology is not necessarily cheap, but there are now sufficient case-studies to illustrate a return on investment within 18 to 24 months, even before connectivity, dynamic pricing and indoor location analytics and services are taken into account (7 out of 10).

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0%

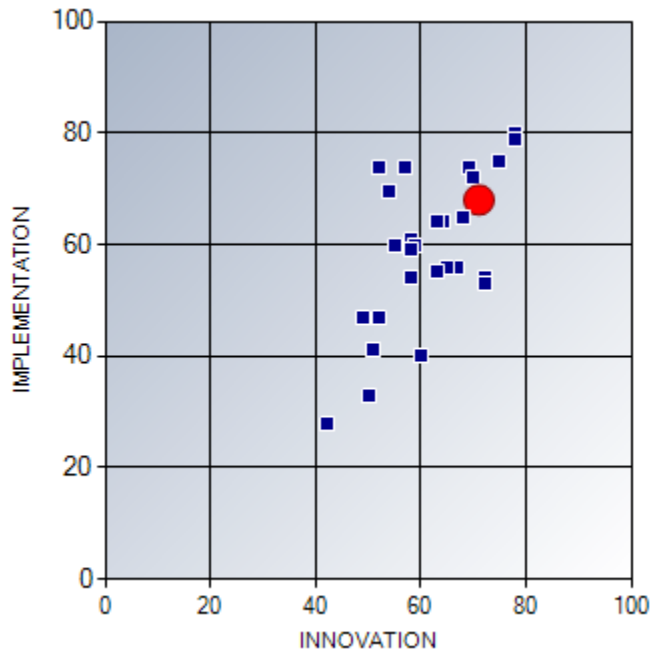
Future potential for this technology is currently very strong. As a standalone technology there is a proven ROI. However, the potential around dynamic pricing and tight integration with the broader retail technology space means that this market is now ready for major uptake. Companies like Aisle411 are achieving some of the benefits of ESL by developing their own store layout/inventory model and this is a direct competitor in that it is a much easier and lower cost model. What companies like Aisle411 lack in comparison is the ability to support dynamic pricing and the ability for customers to interact with products directly in-store.

**shopkick, Inc.**

**Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising**

**Summary**

**Innovation: 71**  
**Implementation: 68**  
**Overall: 69.5**  
**Rank: 6**



**Implementation**

In 12 months shopkick has embraced many of the changes it needed to make and is now reaping the rewards following its acquisition by SK Telecom for approximately US\$200 million. Last year, many felt that shopkick was reaching saturation, using an inaccurate technology that didn't prove ROI or give any benefits beyond rewards. Since then, shopkick has emerged as the leading installer of iBeacons thus far in the United States; it now has over 8 million users and is believed to have generated US\$26 million in revenue in 2013. In terms of its ranking shopkick has now gone from 16<sup>th</sup> to 6<sup>th</sup> in overall ranking.

Value chain support score has increased this year (15 out of 20) as SK Telecom will give shopkick the back-end and loyalty/POS integration know-how that it has perhaps lacked in the past. It can now expand beyond over-the-top and work with retailers on their own-branded apps as well, without any conflict of interest. It has developed its own hybrid approach (10 out of 10) using Audio and iBeacons, with SK Telecom bringing capabilities in other technologies as well, if required. As a result, its accuracy score has increased significantly to 8 out of 10. It doesn't have mapping capabilities today, but ABI assumes that this will become part of the overall offering in the future (0 out of 10). Clearly, it is the most well connected independent app in this area today, with 15 major retailer partners (including Macy's) and 150 brand partners (9 out of 10). The SK telecom acquisition now gives it the opportunity to go global with its offering.

**Innovation**

The difference of the recent changes to shopkick and the SK Telecom acquisition can be particularly felt at the innovation level. It now has analytics capabilities (12 out of 20), with SK Telecom giving it the ability to integrate with other back-end systems. It scores 15 out of 20 for its combined location, surprisingly being one of the few companies that has both a handset and infrastructure-based solution available today. shopkick's audio technology has always had very high penetration (9 out of 10), and now it has the opportunity to extend this worldwide. One of the biggest changes will be at the developer level, where shopkick is now expected to open up its capabilities to its retail partners to integrate into their own applications (9 out of 10). One of the great things about shopkick has been that it has always been a very low cost technology to implement and this remains the case with the move to iBeacons (9 out of 10).

The company has always been unique (9 out of 10), but ABI Research believes that there is a lot of hidden potential in audio that shopkick is not utilizing today. Advertising is at its core (8 out of 10), but now it can expand into other revenue opportunities, which should give it room to breathe as the advertising market still has some way to go before it begins to generate significant revenues.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

#### **Market Share: 41.8%**

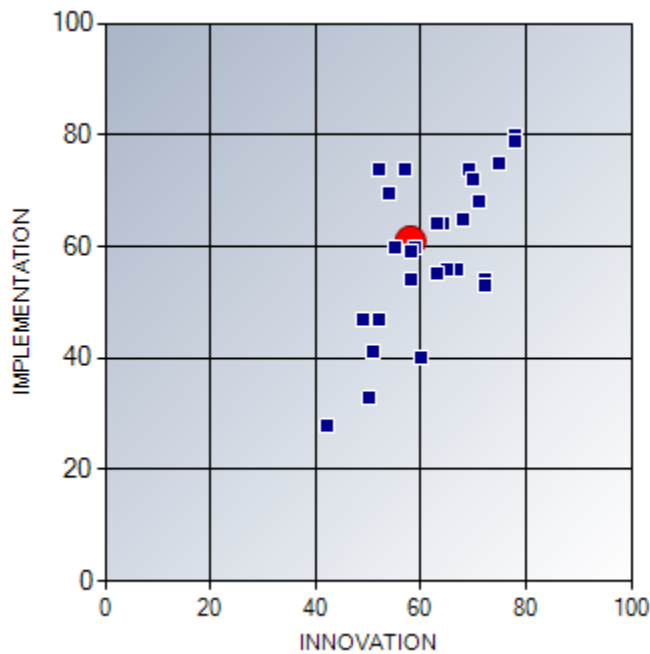
On paper, the merging of shopkick and SK Telecom appears to be a very suitable fit for both companies. This gives shopkick the technical capabilities, financial backing and validation to take its offering to the next level. ABI Research believes that shopkick will change its approach and begin supporting store-branded applications as well as its third party offering. While retailers are reluctant to work with over the top applications there is a feeling of inevitability in having to do so. Shopkick represents a perfect way to do this; by working with a partner rather than a potential threat. 2015 could be a big year of expansion for shopkick, particularly in terms of moving into new geographies.

## ShopperTrak

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 58**  
**Implementation: 61**  
**Overall: 59.5**  
**Rank: 17**



#### Implementation

ShopperTrak has increased its value chain support (12 out of 20) as it now offers its own BLE technology to support indoor analytics as well as looking at next generation camera technologies through the acquisition of ReTel. Ultimately, it is an analytics company and does not appear to be moving into application services, advertising, etc., which is why its score remains lower than others. Its acquisitions of RapidBlue (Bluetooth) and ReTel (advanced camera analytics) ensures it is at the cutting edge of in-store retail analytics, moving beyond its existing people-counting offering, giving it a hybrid and accuracy score of 8 out of 10. It is also capable of combining its solution with Wi-Fi based approaches, if available. As it is analytics focused, it does not support maps (0 out of 10), but it has a strong history in privacy protection (10 out of 10). ShopperTrak technology is deployed in over 70,000 stores and malls worldwide, having announced its 1,000<sup>th</sup> customer in 2014, giving it a huge partnership (10 out of 10) and presence (8 out of 10). It also regularly releases statistics on general shopping trends which are used throughout as key indicators to the health of the retail industry.

#### Innovation

In-store retail analytics is ShopperTrak's core business (14 out of 20), based on 2D camera analytics techniques. As a pure infrastructure-based solution that can track almost all people that enter a store, irrespective of whether they have a phone or not, it scored 10 out of 10 for penetration and power consumption and 5 out of 10 for combined location. It currently does not appear to provide developer support (0 out of 10) or advertising (0 out of 10). In terms of deployment costs, ShopperTrak is comparable to many of the mid-range solutions covered in this report, giving it a score of 7 out of 10.

There are a lot of camera analytics companies in the market today, but ShopperTrak is probably the most unique in that it has a huge installed base as well as its willingness to embrace new technology, rather than hiding their heads in the sand. The traditional people-counting market is under significant threat, and ABI Research believes that there will be significant attrition for those that chose to stand still. However, by combining these technologies with indoor location, gives the technology a new lease of life, while also creating a platform for next generation camera technology, which potentially can give even greater insights.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

#### **Market Share: 0%**

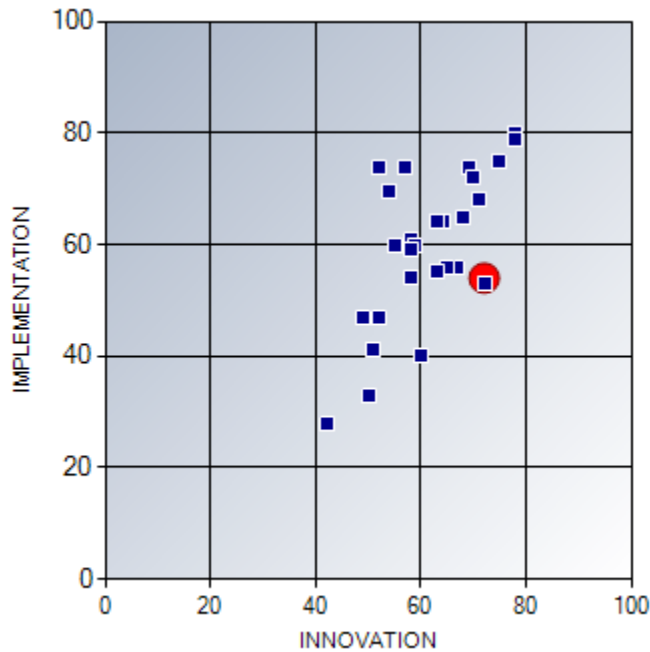
Overall, ABI Research believes that the company is in a very strong position to continue to succeed. Its huge installed base of customers is the perfect platform to start selling its new interior analytics services. Although ShopperTrak is not in the consumer facing business, it should work to ensure that its analytics are available in real-time and can be integrated into these services from other companies. This will bring huge benefits to its retail partners and ensure that ShopperTrak maintains its existing installed base, while continuing to grow. While analytics is still retailer facing today, it has to become an integral part in how retailers improve the customer experience.

## Signal360

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 72**  
**Implementation: 54**  
**Overall: 63.6**  
**Rank: 11**



#### Implementation

Overall, Signal360 received an implementation score of 54, which is above the industry average of 50, but reflects how new the company is to the market. As well as its proprietary audio technology, it also supports iBeacons, giving it a high accuracy score of 7 out of 10, with almost 20,000 beacons now deployed. The company has moved up the value chain, and now supports a range of services including analytics, advertising/marketing and CRM integration with a dedicated CMS offering (12 out of 20).

The system works by integrating the Sonic Notify SDK in an app. The content to be served up is stored on Signal360's content management system (CMS). When the app detects the audio signal assigned to the content, the phone automatically accesses it. The application can be triggered to listen for the signal through geofencing or based on a certain time. The content can also be delivered offline. Full control of these parameters occurs remotely through the CMS. Signal360 has also focused on building a very detailed security layer, which enables a retailer to block over-the-top applications from using indoor location infrastructure (9 out of 10).

In terms of partnerships, it closed a US\$4.25 million round of funding in July 2012, as well as partnerships with Interscope Records, and has been used by New York Fashion Week and Twitter (5 out of 10). Over the last 2 years, it has focused increasingly on retail/public venues and now has 24 customers across sports venues, shopping malls, etc., including Rouse Properties and Philips Edison. The company is very aware of the potential to use audio watermarking to enable cross channel advertising both in-store as well as via TV and other audio outputs and is currently in discussions.



## Innovation

Signal360 now supports analytics (10 out of 20), which it hopes to expand significantly as it begins to gather significant data. It also now has a combined location technology offering (15 out of 20), which it is planning to also use for triangulation and way-finding, although it must be pointed out this is not going to be a core offering. Penetration is one of its key selling points (9 out of 10), along with fast low cost implementation (9 out of 10) and Z-direction location (10 out of 10). It is supported developers with an Android and iOS SDK, which enables applications to leverage installed audio and BLE beacons.

The company's uniqueness has been diluted by iBeacon support and a failure to really expand its audio capabilities, but it clearly has plans in this space. It has an important deployment at the Golden State Warriors stadium, which could be a great proof of concept deployment. Initial trials have shown how the technology was used to upsell higher priced tickets by as much as 67% at games, by targeting customers in lower cost seating areas. The company has always had a strong advertising focus, and has already implemented some in-mall advertising campaigns with companies like Aeropostale. Once deployed, it hopes to create an advertising exchange specifically for Malls and large venues. Increasingly, companies realize that large advertising agencies will not focus on individual buildings in the short to medium term, creating an opportunity to work directly using smaller, tailor-made advertising approaches (8 out of 10).

## Market Share: Retail Indoor Location, Analytics, and Advertising

### Market Share: 0.2%

Signal360 has begun to turn contracts into actual deployments. This would be great starting point from which to start advertising in earnest. It should hopefully also begin to demonstrate its technology into digital signage and TV signals, which when linked to application can be very powerful. This will create the hype and excitement the company needs to move up the next level.

## TCS

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

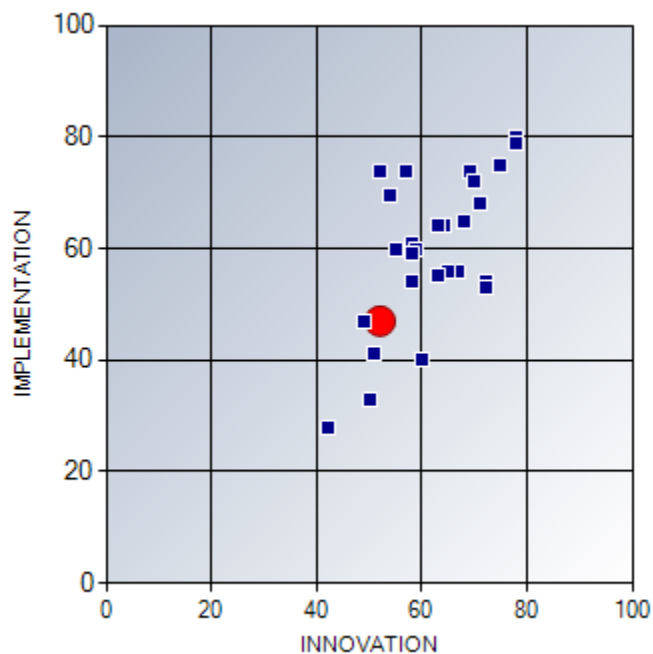
#### Summary

**Innovation: 52**

**Implementation: 47**

**Overall: 49.6**

**Rank: 24**



#### Implementation

TCS is a traditional location platform provider primarily targeting carriers. As a result it covers a much broader scope than just indoor location or retail. However, with carriers aggressively moving into this space, it will need to not only leverage new indoor location technologies (small cells, LTE, HetNets, BLE, etc.), but will also need to tie this in with ubiquitous location technologies to enable a complete analytics and advertising capability that can position it as a Google alternative. TCS is the leading independent provider today of carrier location platforms and is one of the best placed to facilitate a cohesive offering, while also meeting any mandate requirements.

TCS has yet to launch its complete indoor solution, which does limit its overall score. Theoretically, it will have strong hybrid capabilities (6 out of 10) which will be capable of combining any signals available in a particular building, as well as combining it with its existing wide-area technologies. TCS is also very focused on ways to empower consumers with more privacy control (8 out of 10). This is something ABI research understands carriers will be very active on, creating clear differentiation between opt-in/out for aggregated anonymous services and more engaged targeting.

TCS is very active in NG911, and this will be its primary objective, enabling U.S. carriers to meet future indoor location requirements. It is also a prime candidate to support the new first-responder FirstNet network. It has already announced partnerships with Cisco and NextNav to better support these future markets, and ABI Research believes its solution will be capable of sub-10 m accuracy (7 out of 10). In terms of partnerships, TCS has longstanding relationships with Qualcomm on a technology front and a number of leading carriers, including Verizon. U.S. carriers are targeting this space, so it is in a strong position to be involved (6 out of 10).

### Innovation

TCS scores strongly on penetration within the carriers that it works with (7 out of 10) and Z-direction will be essential for future mandate reasons (10 out of 10). TCS does offer APIs to its navigation search and NAVBuilder platform already, but it is unclear how much external developers will be supported with its new solutions (5 out of 10). ABI Research believes that TCS will be very proactive in encouraging developers to use its technology through the provision of APIs to location as well as other elements necessary to provide a high quality application.

Another high score for TCS is power consumption (8 out of 10) as location and assistance data is aggregated at the network level and sent to the handset for calculation. It can also be implemented in handset-based mode, taking advantage of MEMs. It currently does not support analytics (0 out of 10) and it would appear that it is happy to partner on services around data analysis, rather than developing a solution in-house, due to the nature of working with carriers.

TCS's has previously discussed a proposed indoor solution based on the D-SLP, as defined in SUPL 2.1. This will provide routing to a serving location platform for GPS and Wi-Fi location calculation. With SUPL 3.0 supporting location through NFC, RFID, *etc.*, it will enable a complete hybrid solution. The solution can leverage existing network coverage through the deployment of an in-building location server.

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0%

TCS continues to develop its indoor location offering, primarily with mandates and potentially first-responder usage. Its primary target is carriers, who are clearly looking to get into the retail space. One of the big advantages carriers have is the ability to support ubiquitous passive location. There is no reason why TCS could not move to also support these types of services in the future.

## Walkbase

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

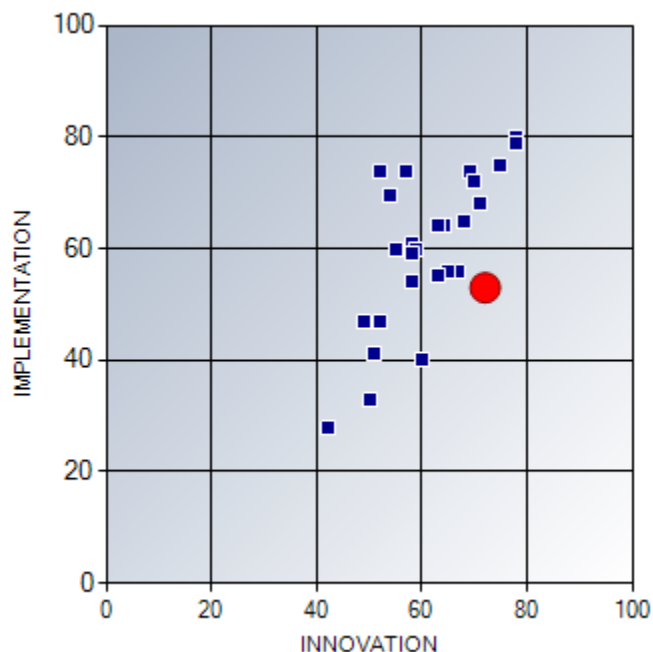
#### Summary

**Innovation: 72**

**Implementation: 53**

**Overall: 63.2**

**Rank: 13**



#### Implementation

Having begun as a handset-based location company, Walkbase has successfully pivoted into infrastructure based Wi-Fi and BLE beacons. The result is a company that is winning deployments across the world, as well as major partnership agreements (7 out of 10). It is also one of the first companies with a successful airport deployment in Helsinki, which has given it a lot of coverage and exposure. It now has wins in Finland, Sweden Switzerland, Germany, Indonesia, Italy, Australia and a number of contracts in the United Kingdom giving it a partnership score of 7 out of 10. It now has 40-50 customers worldwide at different stages of deployment, ranging from large grocery stores and airports down to SMEs requiring a single beacon, translating into hundreds of building deployments. It expects to expand its airport presence rapidly over the next 12 months with 5-10 projects expected to go live.

In its Helsinki deployments it is achieving accuracies of 3 meters (8 out of 10) with updates every 15 to 20 seconds. The airport already has a strong Wi-Fi network, with Walkbase deploying its own Wi-Fi beacons to flesh out the network at low cost. This high accuracy is also achieved using proprietary algorithms and is perfect for passive analytics, while BLE beacons can be added for marketing/advertising. The Wi-Fi solution requires a minimum of two access points to generate a relatively accurate signal. Accuracy improves over time, as more devices map the environment, making it self-healing.

#### Innovation

It operates in Z-direction (10), and has now positioned itself as a strong analytics provider (14 out of 20), as well as expanding its platform to also support marketing/advertising (10 out of 20). Given that it is working in larger public buildings, this is a good move, as there will be a need for advertising, but it is unclear if large advertising agencies will be so focused on specific buildings.

It now supports both infrastructure-based location and a handset-based API for developers through its cloud-based location platform (20 out of 20). This platform makes it very easy for developers/retailers to self-install the technology in store and/or integrating it into an application *via* APIs (7 out of 10). On the mobile device, the Walkbase API processes the location requests from the application with which it is integrated. When a location request is triggered, the API scans the surrounding Wi-Fi networks and sends the results to the server, returning easily parsable location data.

Walkbase has already replaced or won contracts against competitors based on its low cost, which is primarily achieved through its proprietary technology as opposed to charging standard access point prices. The service is very low cost (9 out of 10), starting at US\$200 per store/per month free, with additional fees for in-store department level analytics. Walkbase does not stand out as a unique solution (6 out of 10), but its overall score is up in practically every parameter on last year, as early pivot has enabled it to win significant business.

#### **Market Share: Retail Indoor Location, Analytics, and Advertising**

##### **Market Share: 0.2%**

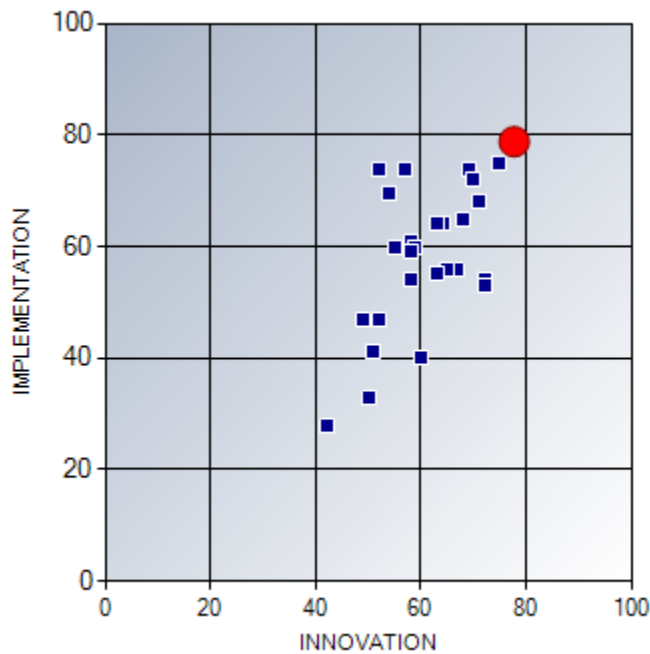
With Helsinki airport, it now has a proof of concept and could go on to establish itself as the leading airport location provider, a very important and profitable market. What Walkbase lacks is the ability to go into buildings as a standard feature of infrastructure, *e.g.*, Cisco, Ruckus, ByteLight, *etc.*; this is where scale is achievable rapidly. Partnerships with these types of companies could help it to move the next level as the market moves to the mainstream.

## Zebra Technologies

### Vendor Matrix: Retail Indoor Location Technologies, Analytics, and Advertising

#### Summary

**Innovation: 77.69**  
**Implementation: 78.82**  
**Overall: 78.3**  
**Rank: 2**



#### Implementation

With Zebra Technologies’s acquisition of Motorola Solutions, a very powerful competitor is emerging that is not only ticking every indoor location technology and service (*via partners*) box, but is also active in RFID, UWB, inventory management, electronic shelf displays, digital signage, *etc.* This is the first company in this space that is bringing so many elements of this market together in-house, as well as extending beyond retail into hospitality, tracking, hospitals manufacturing, *etc.* While this is a very impressive offering on paper, it remains to be seen if these companies can integrate successfully together. The high ranking it receives is based on potential and the next 12 months will tell a lot about its future in this space.

Focusing on Motorola’s MPact platform, it managed the infrastructure, deployment, maintenance and analytics side itself, and works with key partners like Aisle411, Swirl, Retailigence, *etc.*, enabling a complete offering to its customers (13 out of 20) as well as opening up opportunities at partner customers. It doesn’t score a full 20 out of 20 because it doesn’t own the complete value chain itself and thus will miss out on revenue from applications, services and advertising.

It scores 10 out of 10 for hybrid approach, being the first Wi-Fi access point vendor to also support BLE beacons, as well as investing in ByteLight and working with partners looking at other future technologies. As a result, Motorola has the potential to meet any specific demands on accuracy as it has such a portfolio of technologies and partners to work from. It scores 12 out of 15 for mapping. Again it doesn't get full points because it does not actually do the mapping itself, relying on partners, but it is working with partners that are looking at all three aspects of retail mapping: physical mapping, RF mapping and inventory/shelf mapping; in particular Aisle411 and Retailigence are important companies.

On partnerships it scores 8 out of 10, combining scores for its technology partners, the acquisition by Zebra and its own installed base of Wi-Fi access point users. This gives Motorola Solutions a huge overall total available market, which it is beginning to now eat into. The only criticism that can be leveled at Motorola Solutions today is the fact it hasn't won many deployments to date (6 out of 10, market presence), despite ticking every box on paper. ABI Research understands this is likely to change significantly over the next 2 years.

### Innovation

Zebra Technologies scores 17 out of 20 for analytics with a rich platform built into its MPACT offering as standard, covering both BLE and Wi-Fi analytics. It has also worked a lot on enabling retailers to integrate location analytics with other data to bring new levels of insight. It currently works with companies like IBM and Teradata to ensure this is an easy process.

It scores 20 out of 20 for combined location, with no company better placed today in terms of the range of technologies it can leverage. As mentioned it has a huge total available market of existing and new customers to target in 2015 (10 out of 10). On developer support, Motorola had built up strong application partnerships, while also providing SDKs and APIs as part of the MPact platform for integration with a developer application (7 out of 10).

### Market Share: Retail Indoor Location, Analytics, and Advertising

#### Market Share: 0.8%

Zebra Technologies combined with Motorola Solutions and its army of partners represents a formidable offering. However, it now needs to turn a comprehensive offering into deployments and 2015 will be a crucial year. 2014 is likely to be the year of handset-based indoor location and it will be important for companies like this to have established and proven themselves in 2015. It has yet to achieve a major chain win and needs to do so in the next 12 months.