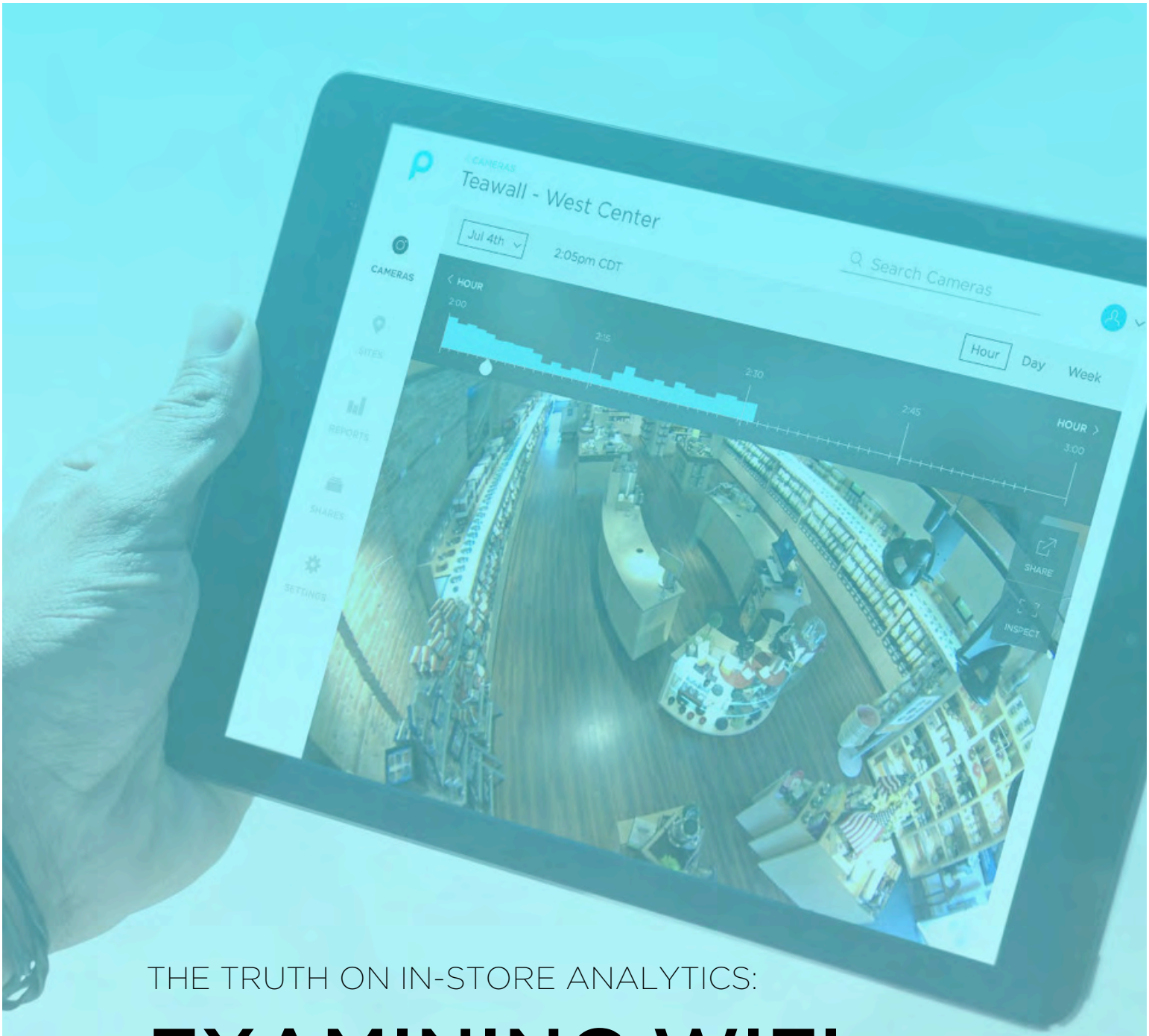

THE TRUTH ON IN-STORE ANALYTICS:

EXAMINING WIFI, BLUETOOTH, AND VIDEO IN RETAIL

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Introduction: The Need Driving Retail Analytics

Brick-and-mortar retail is in the middle of a renaissance, driven by tech and increasing pressure from consumers. While Amazon.com delivers tailored suggestions as you browse, your local department store's aisles remain static. Online retailers track every click, but traffic flow through physical retail stores is yet another unknown. It's clear that in order to compete, retailers need to adopt digital tools, and find a new way to make data-driven decisions.

Are products like iBeacon and Euclid Analytics the answer they've been hailed as? Between huge gaps in data, lack of visual context, and global privacy concerns, it's worth exploring how WiFi and mobile-based tracking fails to provide the solution retailers need. More than that, it's a great opportunity to examine a leading alternative in the field: video analytics.

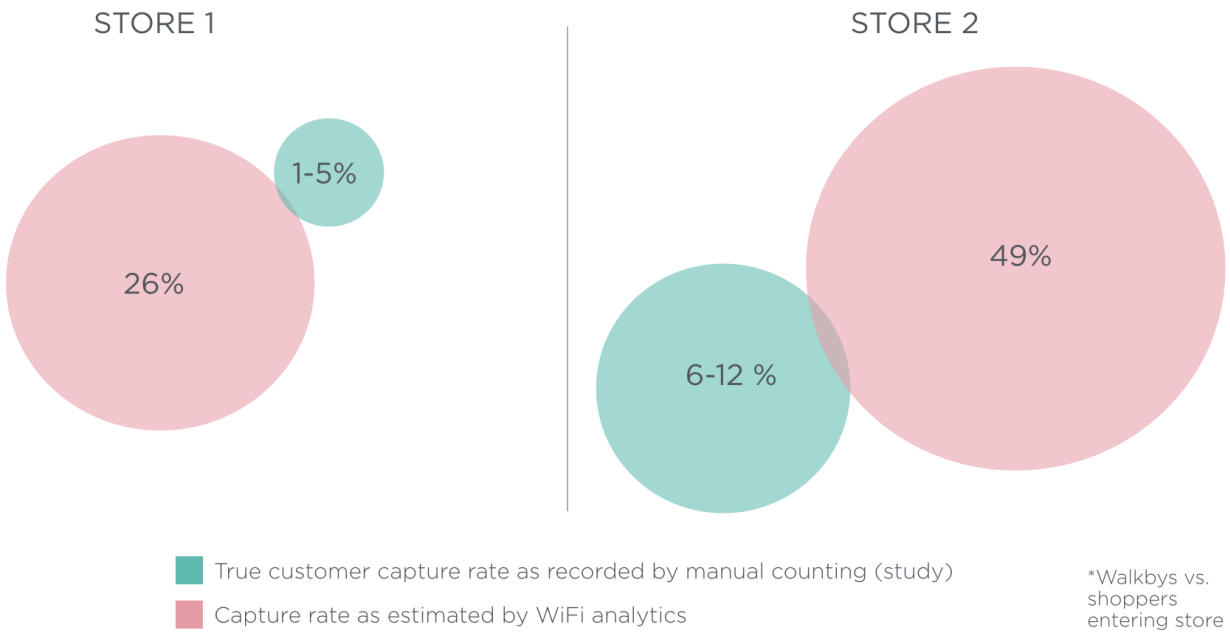
The Trouble with WiFi Accuracy

WiFi tracking is the go-to solution for most retailers to access in-store analytics — but it's deeply flawed. First and foremost, it's far from accurate: WiFi was never designed for the purpose of tracking people. While it might be effective for obtaining rough estimates of individuals' locations, in a retail environment where accuracy to the shelf level is required, it falls painfully short.

In 2014 Monolith conducted a study on the veracity of WiFi tracking solutions currently on the market. Passersby and people entering the tested stores were manually counted in two different cities over the course of a week. This collected data was then compared to Euclid's data the stores had received for those days. There was a vast discrepancy. At one site, WiFi

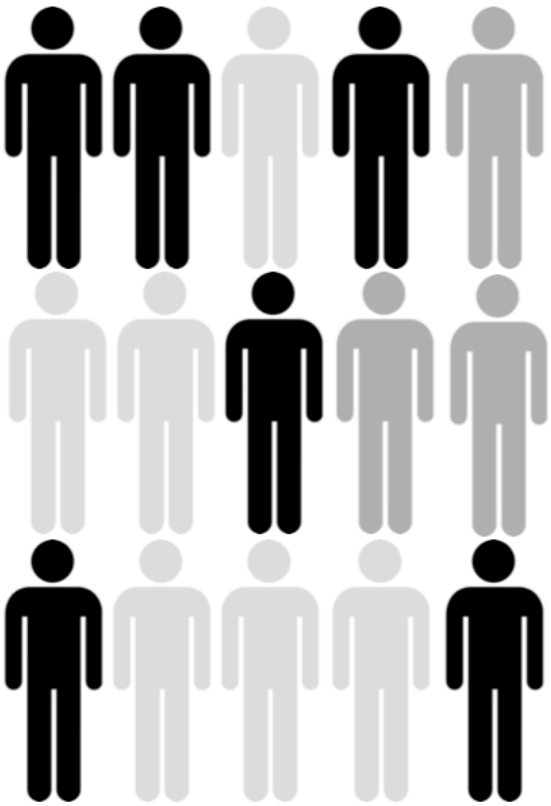
registered only 5% people who actually walked by the store, and 30% of people who entered the store. At the other site WiFi registered only 7% of actual passersby and 60% of store entries. Moreover, using these inaccurate data points to determine capture rate results in completely incorrect estimations. The study found that actual capture rate (the ratio of passersby to entries) at store one was 1-5%, while Euclid estimated it to be 26%. At store two, the study measured a capture rate of 6-12%, while Euclid reported it as 49%. This indicates that on simple tasks like measuring capture rate and people counting, WiFi fails to give retailers accurate insight into their stores.

A Study in Accuracy: Store Customer Capture* Rates

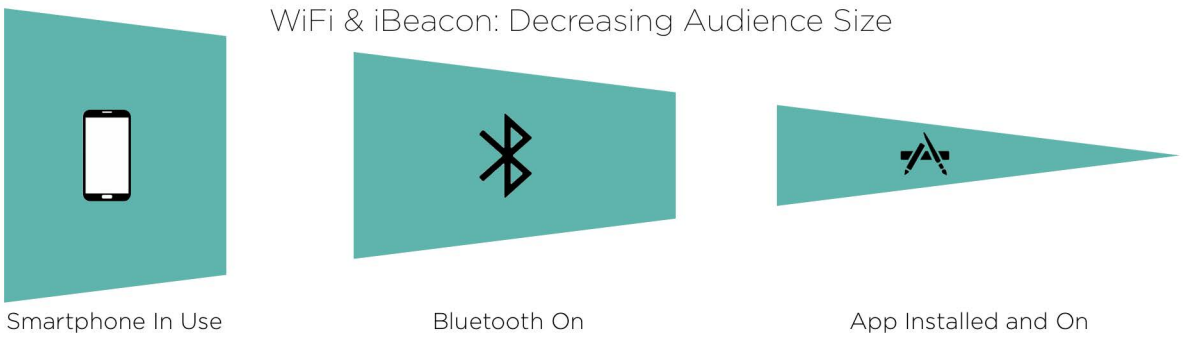


There are several additional underlying technical reasons that make WiFi a poor choice for people counting and/or location tracking. While location determination depends on the continuity of the signal, WiFi's data transmission wavelength is relatively short, prone to signal loss, and easily interrupted (primarily by moving objects, often in the form of other people).[1] Moreover, while triangulation is a common and reliable way of tracking location, WiFi access points cannot conduct triangulation — directly rebutting some solution providers' claims to the contrary.[2] Conversely, video analytics' accuracy does not rely on triangulation, as each element in the camera's field of view has their precise location and path movements captured in the visual grid.

How Mobile Technologies Miss Shoppers



Retailers who invest in analytics software want to gain a comprehensive and accurate understanding of what happens inside their stores. But while video based technologies visually capture every shopper in the store, mobile technologies fail to capture large percentages of retailers' customer bases. Why? Complexity, accessibility, and policy.



No Smartphone, No Customer

Location accuracy isn't the only stumbling block to delivering high-quality retail customer insight that WiFi and related technology face. Retailers looking to use WiFi despite location inaccuracy also encounter a problem with distribution: not every shopper has a smartphone. In fact, only slightly more than half of U.S. adults (58%) own a smartphone.[3] In the UK this percentage lies at 61% for adults and at 88% for 16-24 year olds.[4]

The retail industry's default alternative to WiFi, iBeacons, are facing the same issue. Though their hardware tracks location more accurately, efficacy again relies on the customer base's possession of smartphones. In the U.S. alone, they're still inherently missing over 40% of customers — and thus making data-based decisions while missing almost half the data. And whereas a random sample that captured 60% of all traffic could conceivably still produce a reasonable representation of a store's customers, iBeacon is limited to only capturing smartphone users, making their end-game data inherently biased.

The Problem with iBeacon's Reliance on Bluetooth

If WiFi is out of the question for retailers, iBeacon still posits a possible alternative — except that iBeacon isn't just compromised by requiring a smartphone-owning customer base. For iBeacons to function, shoppers have to have both their phone's Bluetooth and the retailer's application installed and turned on. Whereas retailers that target only millennials (the vast majority of whom have smartphones) certainly exist, the likelihood of a millennial brand whose in-store customers all have Bluetooth enabled and the store app installed and running are slim to none.

Bluetooth usage varies among different age groups and regions. While there is no comprehensive study, indicating the average percentage of consumers that have Bluetooth enabled in store, studies conducted at particular sites can provide some clues. An MIT study at the Louvre found that only 8.2% of visitors had Bluetooth turned on[5] — meanwhile, industry iBeacon providers have claimed their saturation rate amongst their app users is 33% on the high end.[6]

The True Price of Dependence on Apps

Does the app-based aspect of iBeacon really have that big an impact? The short answer: yes. According to Forrester, the up-front fee for building an app is $2 million. Additionally, each following year, the app will cost 80% of that fee — per platform — to maintain.[7] For retailers who want iBeacon customer insights but don't yet have an app, simply going mobile is a huge investment of money and time.

Mobile-savvy retailers with apps already developed still need to invest significant resources to promote app installs and usage. 67% of people who shop on their phone or tablet (already a preselected group) only use apps from their favorite stores,[8] forcing retailers to deploy costly marketing campaigns and discounts to increase app usage and capture more customers.

Participating retailers in an in-house study noted that there exist additional operational challenges to promoting app installs within target customer groups. Monolith's retail study participants stated that if new technologies are introduced, they are introduced on a staggered schedule, effecting how well even localized campaigns would reach their intended audience.

The Privacy Challenge

With weekly headlines about consumer data security and individual rights, privacy is a well-established hot topic both in the US and internationally. The American CISA Security Bill has come under fire for exposing individuals to intrusive data sharing[9], while the EU has recently pushed new, more stringent laws on data privacy[10] [11] under immense public pressure. In the retail sphere, these concerns have translated to backlash over iPhone tracking features[12] and unflattering comparisons of iBeacons to dystopian technology depictions in Hollywood.[13] Over half of Americans alone both find government surveillance unacceptable and will not download an app because of the data it collects.

The truth is that no matter consumers' stance on retailers gathering customer data, iBeacons and other WiFi tracking devices do not have the infallible security to prevent individuals with malicious intent from manipulating how consumers interact with mobile devices. Projects like Estimote state that their products can be forced to deliver third party advertisements and messages to customers without the retailer or customer's consent; iBeacon has the same flaw.[14] Meanwhile, companies like AVG Labs[15] and Blackphone[16] are launching smartphones and apps that protect consumers' anonymity and reduce tracking accuracy.[17]

Privacy matters to consumers — and as long as shoppers are concerned about their personal information's protection, companies that do not respect these concerns are bound to come under fire.

The Case for Video

Retailers need customer insights that are both accurate and comprehensive. Additionally, they need to be actionable, with a proven ROI for operations, sales, and merchandising teams. Retail conversion analytics are the beginning of customer understanding, but context for those numbers is critical to making conversion actionable.
If WiFi is out of the question, the industry's alternative must provide retailers with verifiable counting accuracy, full customer paths, access to real-time counting data and on-demand reports, quantified traffic and dwell data from any store display area, and privacy-protected answers. It's a long list of requirements, but the good news is that recent advances in computer vision have enabled the creation of just such a product.

Video analytics have a unique position in the retail analytics sector. Using the IP cameras and condensation of this visual data makes it incredibly low bandwidth: VMSes that retailers already have in their stores, software can be installed in-store and start providing retail insights almost immediately. While raw video footage is streamed to the cloud and deconstructed to track movement and compile privacy-protected data, high-accuracy counting can be conducted for any store area (department, aisle, or floor) with configured tripwires.

Additionally, each video feed is condensed into second-by-second snapshots and funneled into a remotely accessible app UI that provides visual context for this counting data. Camera data is stored in the cloud, allowing it to be instantly accessed and saved indefinitely. Algorithms applied to the data automatically siphon out every individual in the video while tracking their paths for privacy-protected analytics.

In combination, this enables historical conversion comparisons, counting accuracy verification, and a plethora of traffic and dwell analytics that supplement raw counting data. Moreover, the

Video footage can be accessed on any 3G, 4G, or WiFi device. That's a far cry from iBeacon and Euclid.

Conclusion: What Retailers Want

Retailers don't just need a fast response to the analytical capabilities and customer insights that e-commerce has – they need a real solution. There may be industry hype around WiFi tracking, but it's an idea that falls short when it comes to accuracy and implementation. Between hardware inaccuracy, infringing on privacy, assumptions of smartphone ownership, relying on customers to install third party apps, and the ever-evolving litigation around MAC addresses and Bluetooth tracking, brick-and-mortar stores need an alternative way to understand more about their customers.

That's where video analytics comes in. There's simply no better way to understand occupancy, identify crowd size, track customer paths, protect privacy, and measure conversion. The WiFi tracking industry may be broken, but video analytics make it easy to access instant, accurate data, compare store performance across regions or channels, and predict global patterns and trends. See for yourself.

Prism

With Prism, use cloud-based video to explore stunning images of your store, get real-time visual business intelligence insights, and understand the customer journey.

www.prism.com
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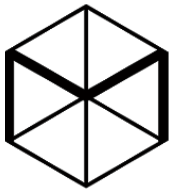

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Monolith provides a full in-store analytics solution. Get actionable insights based on in-store behavior.

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