

Ruckus
Moxie Retail Analytics
datasense

Leveraging Wi-Fi Location Analytics for Retail Store Optimization

A Ruckus Wireless case study featuring Moxie Retail



Executive Summary

New technologies have dramatically changed the retail landscape. Retailers initially faced the threat of online competitors without retail store costs who were able to leverage detailed customer shopping and preference information to better target promotions. Now, after building their own online capabilities, retailers need to master omni-channel marketing to sync the analytical, highly targeted approaches of online with the hands-on, experiential environment of in-store. Several new technologies such as video analytics, Wi-Fi analytics and beacons have emerged to help retailers optimize their bricks and mortar store experience and profitability, but there are still many questions and for the most part, retailers are piloting these solutions rather than committing to full rollouts.

Ruckus Wireless's SPoT location-based services were recently deployed at a major North American retailer to help understand and optimize a new format store design. This paper describes the project objectives and how Wi-fi based location data provided entirely new measurements of shopper traffic and buying habits that led to a new design and very specific, measurable performance improvements.

Using SPoT location data from the Ruckus Wi-Fi infrastructure, integrated with additional store data, helped Moxie Retail drive a 17% increase in sales over a 6 month period.

Background

Recently, a large, big-box retailer introduced a new small-store format to offer a limited selection of SKUs in a more convenient, 'local' store that would still leverage the buying power, logistics and management from a nearby 'parent' large-format store. This format targeted urban shoppers needing a convenient option for items such as hardware and housewares, and was intended to also build brand loyalty for the larger format stores.

Because of disappointing early results, the store retained Moxie Retail, a store analytics and design expert, to evaluate performance and recommend changes. Moxie realized they needed to go beyond just looking at POS transaction-level results. Since this was an entirely new store format, they needed to evaluate how the format was impacting product sales in order to identify and quantify potential store redesigns. Moxie had a lot of experience in this area, having previously conducted several store optimization studies using manual counters as well as technologies such as RFID and Wi-Fi locationing. However, given the aisle-level accuracy requirements for this project, none of the previous solutions they'd used would work.

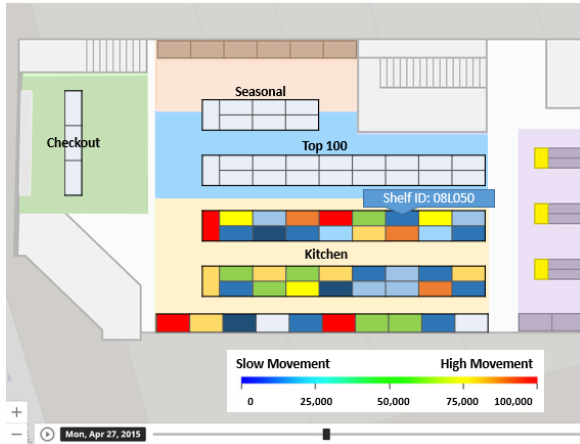
After researching new solutions, Moxie reached out to Ruckus Wireless to learn more about their SPoT location-based service solution. Ruckus SPoT is one of several examples of new Wi-Fi services, and was appealing to Moxie because it was easy to integrate into existing databases with other store data, and because it seemed to offer superior accuracy and scalability compared to some alternative Wi-Fi based location solutions.

Note that all Wi-Fi based footfall analyses are statistical samples – they can only measure shoppers or employees that have Wi-Fi enabled devices. In a typical retail environment, a very high percentage of shoppers will have Wi-Fi enabled devices and between 50-70% of them are likely to have their Wi-Fi turned on, so will be able to be anonymously tracked via the Wi-Fi infrastructure. Employees can be automatically detected and separated based on the frequency and duration of their presence, especially if they are using store-issued equipment such as a tablet, scanner or mobile computer.

Phase 1: Sense – Product and Customer Behavior

The initial phase developed baseline insight into product location and performance and related customer behavior such as number of shoppers, length of stay in store, and visit frequency/loyalty. For product and product placement analysis, Moxie heatmapped product SKUs down to the shelf location based on revenue and unit volumes to identify the highest selling products and locations. This Space Productivity analysis highlighted several product assortment issues and generally low average transaction amounts.

Figure 1. Space Productivity Analysis



These were important findings, but store management still needed insight into how the store layout may have impacted these results. They needed to understand where customers were going in the store, which areas they stopped in, and whether they were even seeing the products on the shelves. Moxie worked with Ruckus to design and install a high-accuracy Wi-Fi network that included extra Ruckus R300 access points to drive more accurate locationing, in this case assuring that all shoppers with Wi-Fi enabled devices could be tracked within specific aisles of the store.

The first integrated product/customer flow analysis, Store Penetration, mapped out which departments customers visit and how much time they are spending in each one. Immediately, this revealed that fewer than 20% of shoppers were visiting the lower level, and also that most shoppers visited one department and left. This implied that customers were not finding what they came looking for and suggested a number of potential layout improvements, including moving destination categories to the lower level.

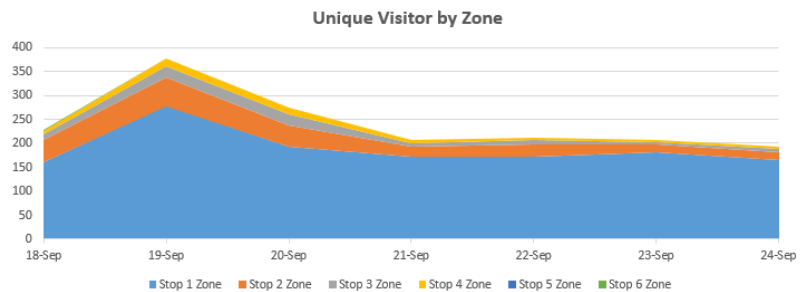
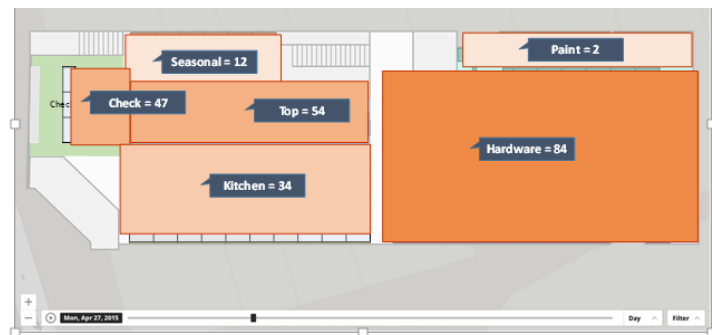
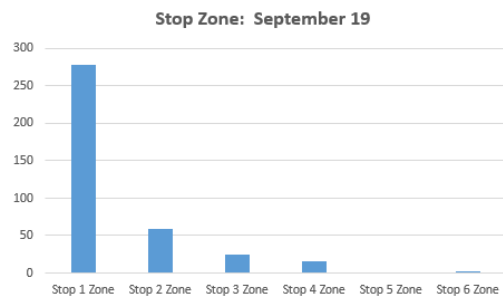


Figure 2. Store Penetration

Using Ruckus SPoT data, Moxie was further able to identify First Visit areas in the store, which shows the shoppers' primary 'mission' for visiting the store, and is also an ideal metric for evaluating promotion effectiveness. In this case, most shoppers were visiting the Hardware department first, and very few shoppers were going to the promotional/seasonal section of the store. Based on these findings, Moxie and store management identified opportunities for the store to expand their hardware selection, increase their promotional activity and expand the associated promotional space in the store.

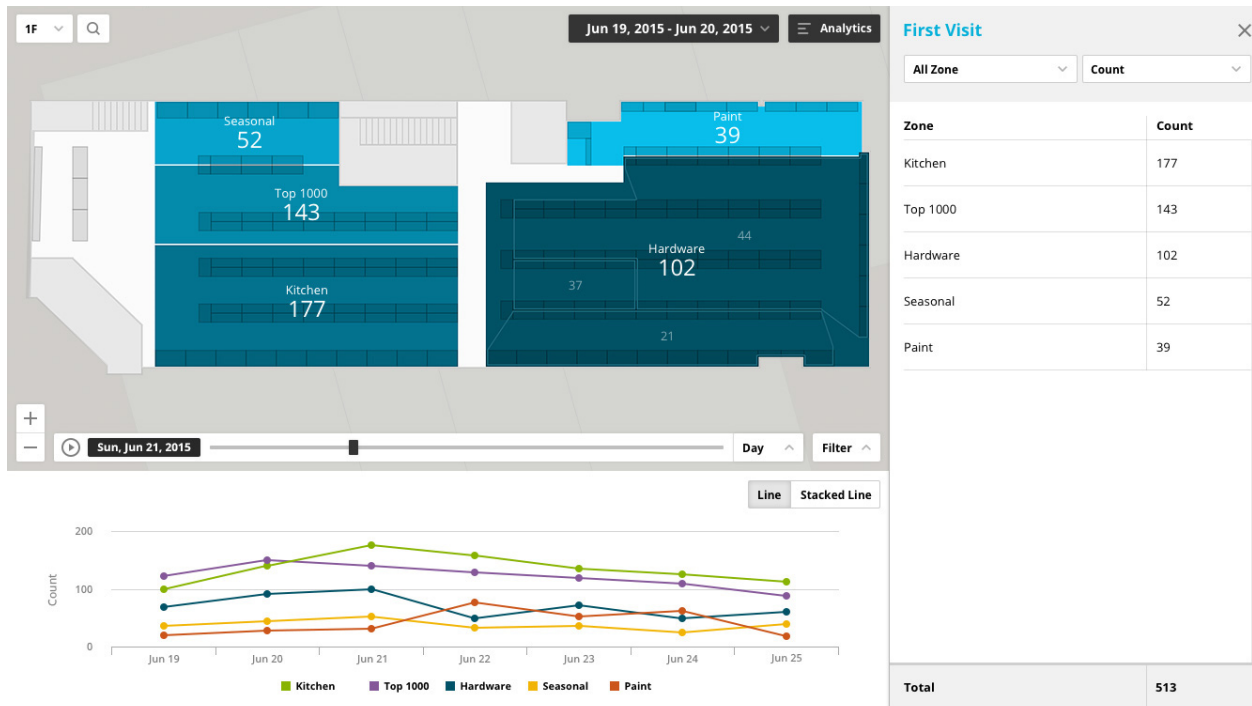


Figure 3. First Visit

Further, Moxie leveraged Ruckus SPoT standard metrics on length of stay, visit frequency, and recency to show that nearly 70% of shoppers only came in for 'Quick Trips' of less than 5 minutes, and that nearly 75% of shoppers visited the store fewer than 5 times in 2 months. This helped Moxie and store management determine that shoppers were not finding what they were looking for, so they were leaving quickly and not returning.

Finally, Ruckus SPoT also provided metrics for traffic in the store by day of week and hour of day. Matching this with PoS transaction data allowed Moxie to develop clear conversion metrics to highlight opportunity gaps. These were further mapped against staff scheduling and allocation data to pinpoint whether these gaps were likely related to product selection or other factors such as not having sufficient staff available in peak times or the need to adjust store hours.

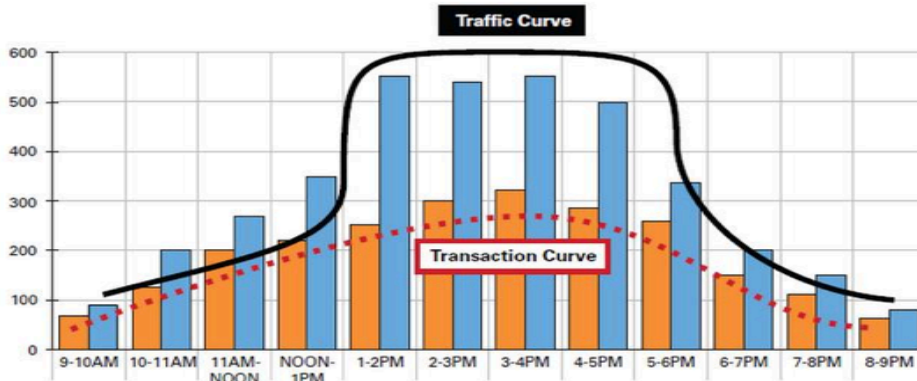


Figure 4. Day of Week / Time of Day

Phase 2: Opportunity Identification

Store management knew they needed to make changes, but after studying the initial metrics they realized they needed more data to understand exactly what changes to make. Moxie used Ruckus SPoT to create more granular location zones so that they could capture full customer traffic analytics down to specific paths and aisles. Mapping more granular aisle-level Day of Week/Time of Day metrics with same-time transactions for related SKUs identified aisles and products with below average traffic or conversion rates. This data was further mapped against labor scheduling and allocation to determine how staff availability impacted these metrics. For instance, a high dwell time area with below average conversion rates could indicate a need for greater staff in that department to answer questions and improve conversion rates.

Aisles where traffic and transactions were did not align then became the initial targets for improvement opportunities, from new merchandise, to new staffing or store hours, to new layout ideas.

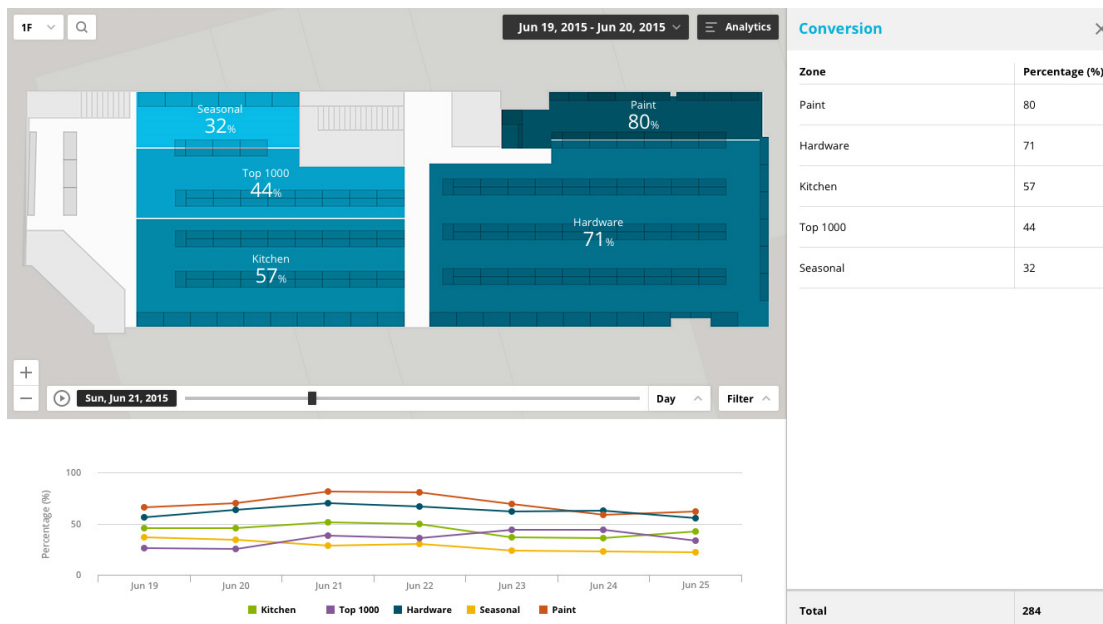


Figure 5. Conversion Analytics

Ruckus SPoT data also helped Moxie understand issues related to staffing, stocking and promotional campaigns. Staff productivity is traditionally measured based on sales vs staff hours at the store or department level. Since Ruckus SPoT can automatically recognize employees, it accurately documents where employees are spending time, enabling analytics such as how much time staff are spending in front helping customers, in specific high traffic areas, or helping with promotional items. Each of these provides quantitative metrics to understand past performance and measure improvement initiatives.

Similar metrics can be generated, and were utilized by Moxie, to measure promotional performance. Measuring actual foot traffic near promotional items can show whether or not more shoppers came in to buy the promotional item, as well as providing before and after conversion rates. So instead of just knowing whether or not a promotion was successful, Ruckus SPoT can help managers understand:

- Did the promotion bring more people into the store/aisle?
- Were promotional items placed in attractive locations?
- For every shopper in the aisle, did conversion rates show expected improvement?

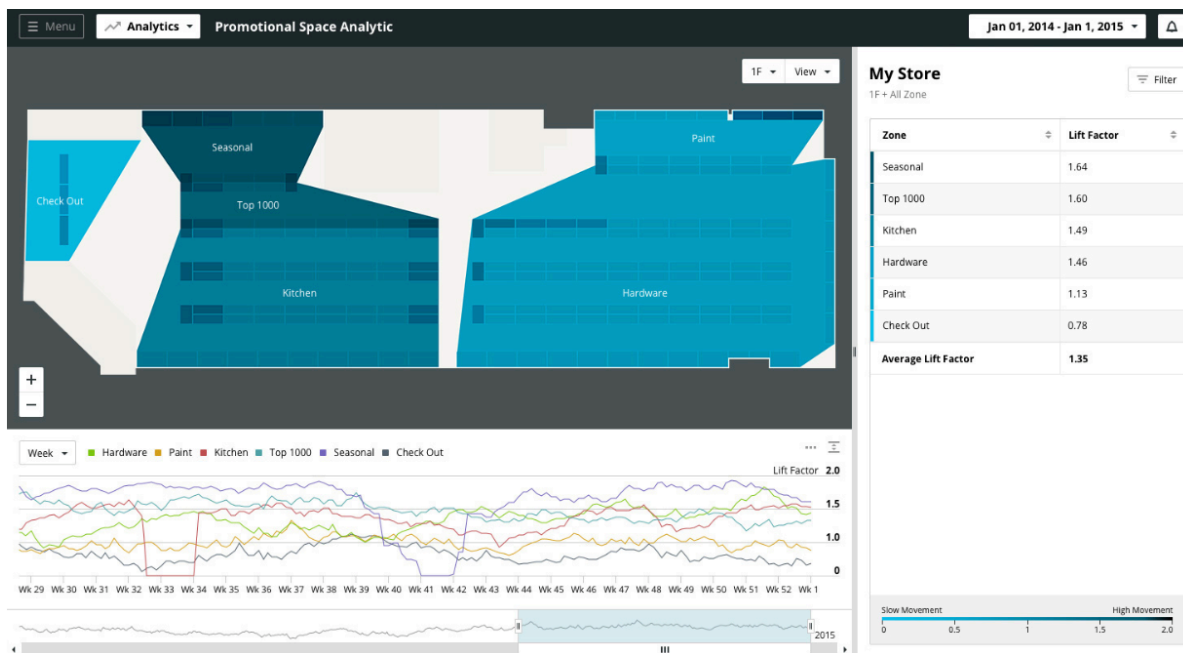


Figure 6 – Promotion Management

Phase 3: Results Measurement

Ultimately, any operational improvement initiative must deliver measurable results, and again, having automated, granular footfall traffic metrics provided significantly more valuable insight. For instance, once there is a baseline set of traffic data, store managers could specifically quantify the impact of layout, staffing or promotional changes. For this retailer, Moxie created a Before/After Zone Traffic analysis to measure traffic changes by zone, clearly documenting the impact of changes against quantified baseline measures.

	March 2015			April 2015			May 2015			June 2015		
	Left	Center	Right	Left	Center	Right	Left	Center	Right	Left	Center	Right
Back	0.4%	2.7%	6.1%	0.1%	3.7%	7.4%	1.4%	4.4%	5.2%	2.1%	4.7%	6.7%
Middle	0.7%	31.6%	17.3%	1.0%	31.7%	11.0%	0.6%	23.1%	15.4%	0.9%	19.2%	17.8%
Front	6.0%	15.6%	19.6%	6.3%	11.8%	26.9%	4.4%	10.6%	34.8%	4.4%	7.4%	36.8%
	Change vs Prior Period			Change vs Prior Period			Change vs Prior Period			Change vs Prior Period		
				-0.3%	1.1%	1.3%	1.3%	0.7%	-2.2%	0.6%	0.3%	1.4%
	NA			0.3%	0.2%	-6.4%	-0.4%	-8.7%	4.4%	0.3%	-3.9%	2.5%
				0.3%	-3.7%	7.3%	-1.9%	-1.2%	7.9%	0.0%	-3.2%	2.0%

Figure 7 – Before / After Zone Traffic Analysis.

Results to Date

By mapping zone traffic changes with transaction data, Moxie was able to demonstrate not just a 17.2% increase in sales, but also show what portion of that was driven by increased traffic, improved conversion rates, and increased average transaction values.

	Traffic	Conversion	Avg Transaction Value (ATV)	Sales
Oct 27 – April 15, 15	201,090	38.0%	\$22.77	\$1,739,951
April – Oct, 15	211,145	39.6%	\$24.39	\$2,040,799
	+ 5%	+4.3%	+ 5.2%	+ 17.2%

Automated footfall analytics data from Ruckus SPoT provides an entirely new degree of insight and measurement to help retailers and retail experts like Moxie Retail better identify and quantify sales improvement opportunities, and then measure success of changes or future promotional or merchandising initiatives. Easily collected from the Ruckus Smart Wi-Fi infrastructure, SPoT location data is a key element to enable retailers of all types to improve store performance and compete with data-driven online retailers.

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