

Smart Phones, Smart Malls

Cellphone Data Are Changing the Industry's Understanding of Shoppers, Leasing and Advertising

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Abstract: Anonymous digital traces on shoppers' cellphones and smart mobile devices can be aggregated to provide better consumer data. These data are being used to create the highest-performing tenant mix possible within the shopping center, reduce the length of time units are vacant and redesign malls around the consumer's desire to stay longer and spend more in these environments. This article also describes how in the future, mobile-device data may enable the mall industry to embrace "showrooming" by moving away from leases based on store turnover and towards those based on the volume of shopper traffic delivered to each store.

Introduction

The 2011 Brad Pitt movie *Moneyball* charts the fortunes of Oakland Athletics general manager Billy Beane, tasked with turning around a losing baseball team, and Peter Brand, a graduate of the Massachusetts Institute of Technology (MIT) with a mission to apply statistics more comprehensively to the national pastime. Together, Beane and Brand counter anecdote with data as they rebuild a franchise from the numbers up. They succeed, as they create a team that wins a league-record 20 consecutive games, and in doing so, fundamentally change their sport.

In the shopping-center industry, *Moneyball* could be *Moneyball*. For as with the baseball industry in the movie, the mall industry today operates with little data on shopper behavior.

The average mall will receive 9.8 million visitors per year,¹ and each shopper will average approximately 82 minutes per visit.² But what does the industry know about what shoppers do in the mall during that time? Until now, very little.

On average, shopping centers will conduct market-research surveys once or possibly twice a year. Each time, they may seek to obtain between 750 and 2,500

responses to their questionnaire.³ That means the industry is collecting data on, at most, 0.03% of its shoppers.

But cellphone data are making it possible for mall owners to understand:

- How many shoppers visit the mall;
- How long they stay;
- Which stores shoppers visit;
- How shoppers flow around the mall; and
- How frequently shoppers return.

For years, online retailers have been gathering consumer information by observing how shoppers "click" as they move around their Websites. Cellphones, too, offer their own opportunity for data collection, as detecting "pings" offline is analogous to counting "clicks" online.

Path Intelligence is one firm measuring "pings" as cellphones and other mobile devices connect to mobile-network operators (AT&T, Verizon, Vodafone, etc.). Using technology developed out of MIT, Path Intelligence detects each ping on multiple sensors placed within the

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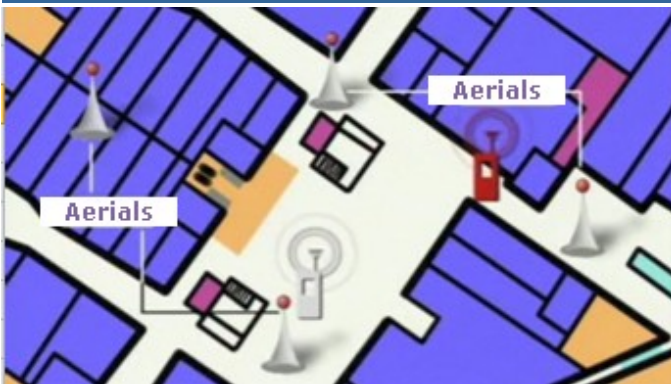
¹ Path Intelligence data, August 2011 to August 2012, based on its portfolio of malls that pulls from eight countries, most heavily the United Kingdom.

² *Ibid.* In contrast, the typical mall shopper stayed 60 minutes per visit in both the United States and Canada in 2010. See Jean Lambert and John Connolly, "After the Recession: Surprising New Patterns of U.S. Mall Shoppers," *Retail Property Insights*, Volume 18 (Issue 2), 2011, pp. 27-32, and John Connolly, "Canadian Mall Shoppers More Purposeful," *Retail Property Insights*, Volume 18 (Issue 2), 2011, pp. 33-37.

³ Data from an informal Path Intelligence survey of 37 shopping centers in the United Kingdom.

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Figure 1-1
Multiple-Sensor Detection of Digital Data



Source: Path Intelligence

mall. The ping's origin is identified by triangulating between the sensors, as shown in Figure 1-1.

By locating the origin of the mobile device signals and by aggregating these anonymous data, virtual paths can be created for the crowds moving through the mall. The data can be used to establish flows through the mall, bottlenecks, and most and least popular stores, as well as for operational purposes such as predicting shopper traffic to optimize staff scheduling.⁴

Why Is It Useful?

Data derived from cellphones (and other mobile devices) enable mall owners, developers and operators to:

- Monitor the performance of each mall and across mall portfolios;
- Optimize the tenant mix for maximum attractiveness to local shoppers;
- Raise revenues from advertising;
- Market vacant space to potential new tenants; and
- Measure the effectiveness of marketing events and promotions.

Each of these benefits is described in more detail below.

Monitor the Performance of Each Mall and Across the Portfolio

Cellphone data enable owners not only to understand shopper traffic unique to each mall, but also, perhaps more importantly, to quantify the quality of that traffic. In addition to tenant sales data (if available), three key performance indicators should be measured continuously for each mall:

1. Shopper Traffic: Counting shoppers is complicated in today's malls. In many cases, malls are being built on brownfield sites in the middle of urban areas and are fully integrated into surrounding retail, so that shoppers may be unaware when they pass from the mall into the neighboring town or city.⁵ At the same time, new malls and/or expansions to existing malls are often built in outdoor spaces without enclosed roofs.

These architectural changes have rendered previous technologies obsolete. No longer are there defined entrances where beams or cameras can be conveniently located. Nor is it the norm that shoppers simply enter, shop and leave. Instead, shoppers enter and exit the center multiple times throughout a single journey, making entrance-based counting systems unreliable.

For these and other reasons, it has proved increasingly complex to determine how many shoppers are visiting the site. At the same time, it has become more important than ever for malls to deliver shopper traffic for tenants and advertisers (see the discussion below on the rise of "showrooming").

2. Shopper Frequency: Traffic measurement on its own, however, is no longer a sufficient metric for understanding the performance of a mall, for shopper behavior has changed. With an increasing array of products available online or via local supermarkets, shoppers are visiting bricks-and-mortar shopping centers less frequently. But once they do arrive at the mall, they stay longer than in previous years.⁶ Consequently, while traffic is in decline, dwell time (the average length of stay in a center) is rising.

3. Shopper Dwell Time: Reinforcing this trend toward less frequency visits is an increasing awareness of the importance of dwell time in predicting consumer

⁴ The Path Intelligence solution is designed to protect the privacy of shoppers and does not detect personal information. The solution has been reviewed by the Federal Trade Commission in the U.S., the Information Commissioner in the United Kingdom, and a number of other privacy regulators globally.

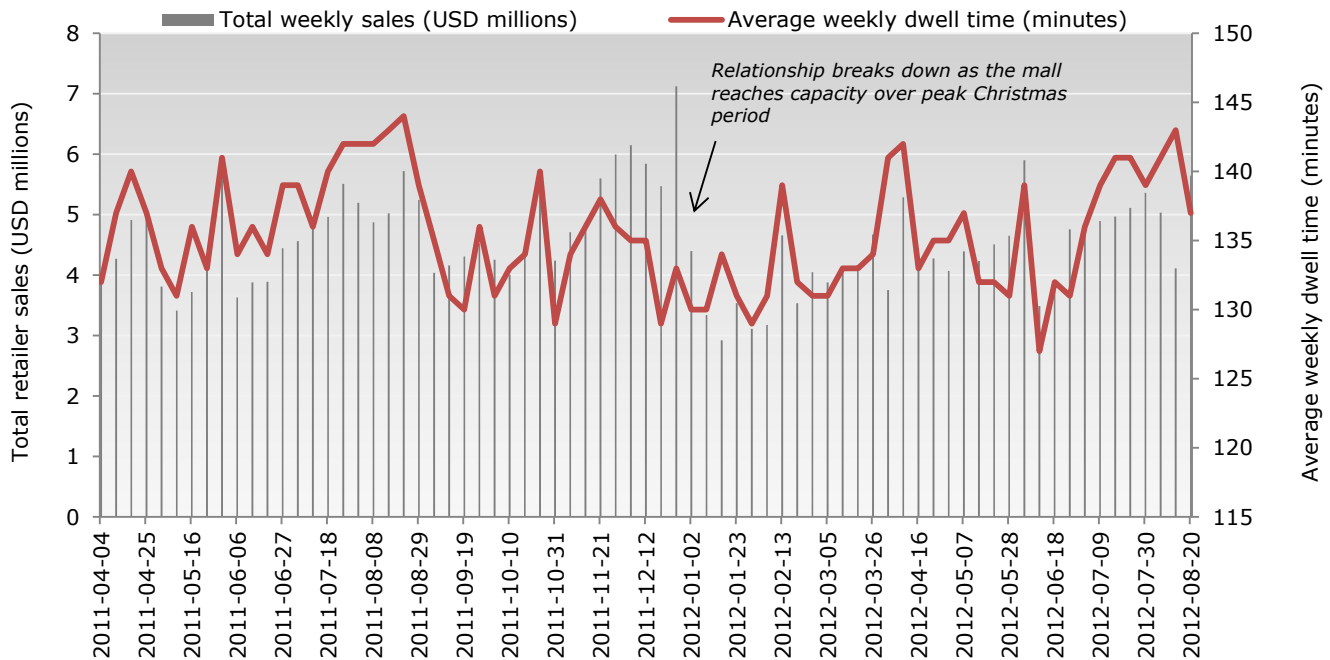
⁵ The Princesshay shopping center in Exeter, United Kingdom is a good example of this type of integration, as is the Mosaic development in Washington D.C.

⁶ Path Intelligence data from 2008.

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Chart 1-1

Average Weekly Dwell Time Versus Total Retailer Sales Within Mall



Source: Path Intelligence

expenditures in the mall. In 2009 Path Intelligence, in collaboration with MIT, combined nine months of mall turnover data and of shopper dwell-time data, discovering that for the mall in question, a 1% rise in dwell time was associated with a 1.3% rise in spend.⁷ (The connection between these two variables is illustrated in Chart 1-1.)

Moreover, there is an important link between dwell time and the physical capacity of a mall. Although architects speak of the mall's capacity in terms of health and safety guidelines, it was formerly impossible to identify how shoppers would behave when a mall neared these limits. With analysis of dwell-time data, however, shoppers reveal when crowds make them uncomfortable, for an immediate tradeoff becomes apparent between increased traffic and increased dwell time. The 600,000-sf inner-city mall that is the subject of Chart 1-2 reaches capacity at just over 400,000 shoppers per week. When

traffic rises higher than this figure, shoppers leave and dwell time drops.⁸

Optimize Tenant Mix to Appeal to Local Shoppers

Not unlike the adage "that the whole must be greater than the sum of the parts," a mall tries to bring together shops that are most effective as a collective whole. Yet unreliable cross-shopping data have often made it difficult to attain this goal.

Cellphone data, however, enable mall operators to understand how shoppers group stores together on a single shopping journey. These data can be used to help mall managers understand which stores are performing well and which are not. In addition to the sales data and financial criterion that clients will be analyzing, this information highlights which stores:

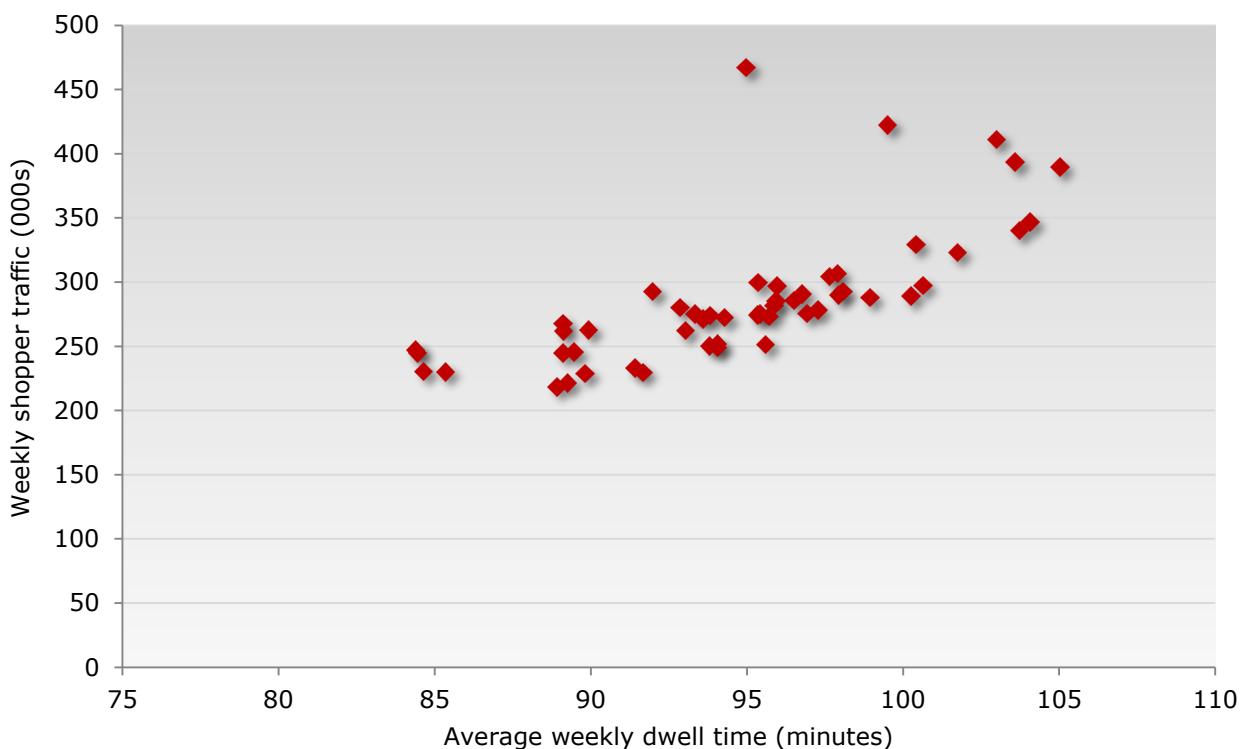
- Increase the overall volume of shopper traffic to the mall; and
- Offer the greatest cross-shopping opportunities such that they deliver traffic to other mall stores.

⁷ Sharon Biggar, [Time is Money: Shoppers Buy More When They Stay Longer](#), Path Intelligence: Port Way, Portsmouth, United Kingdom, 2009, retrieved September 5, 2012. Further in-house research conducted since the release of this paper has shown the result to hold true across all malls that have been studied thus far.

⁸ It is interesting to note that the correlation between the total weekly sales and the average dwell time for the data behind the graph in Chart 1-1 is 0.5 for the dataset as a whole (August 27, 2011-August 26, 2012). As shown on the graph, the relationship falters over the December period. If December is removed from the analysis, the correlation between these two variables rises to 0.7.

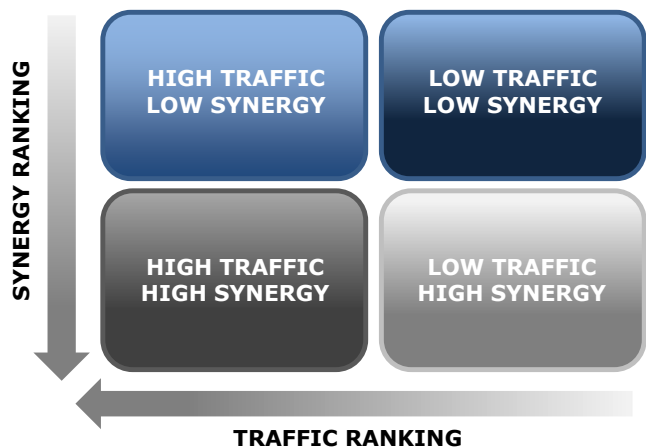
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Chart 1-2
Dwell Time as an Indicator of Center Capacity*



* Based on a 600,000 sf inner-city mall.
Source: Path Intelligence

Chart 1-3
Synergy Matrix: Identifying Strong and Weak Retail Performers



Source: Path Intelligence

Chart 1-3 illustrates how this analysis is conducted across a mall. The best stores will be in the lower left-hand quadrant of the visual. They achieve a high volume of traffic and are synergistic with other stores across the mall. By contrast, the stores in the upper right-hand quadrant receive a low volume of shopper traffic, and shoppers who visit those stores are unlikely to shop elsewhere across the center. These are stores that can be churned. Not only will the loss of these stores have a negligible impact on the overall level of traffic to the mall, few other stores are likely to be impacted by the loss of these retailers. Chart 1-4 offers a more detailed synergy matrix.

Is Apple a “Good” Tenant Under This Definition?: It is interesting to note that Apple is not always located in the bottom left-hand quadrant. While Apple stores attract a high level of traffic, they are often not synergistic with other mall retailers.

Indeed, of those shoppers who enter an Apple store, only 33% are likely to visit three or more other stores across the mall during the same visit. By contrast, 60% of traditional anchor store shoppers⁹ will visit three or more other stores during the same shopping journey.¹⁰

⁹ This analysis of traditional anchors included Macy’s, Sears, John Lewis, Marks & Spencer and Debenhams.

¹⁰ Path Intelligence data for the week commencing August 20, 2012.

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Chart 1-4

Synergy Matrix: Stores to Keep Versus Those to Churn



Source: Path Intelligence

Raise Revenue From Advertising

Advertising billboards within malls have suffered from the same lack of data that have also frustrated shopping-center management. Research conducted by Path Intelligence suggests that mall-advertising billboards could be priced as much as six times higher in some cases, if only the data to measure and analyze the success of that advertising were available.¹¹

Not only have the prices of advertising billboards been lower than could have been expected, but the usage of that space is also sub-optimal. Research¹² has concluded that the closer the advertising is to the point of sale, the more effective that advertising is. Yet consistently, mall-advertising billboards promote products or services not available within the center (such as cinema or motor-vehicle advertisements), rather than products of existing occupiers.

However, when occupiers *do* advertise, the results are dramatic. In an indicative test case conducted by H&M in

the United Kingdom, Path Intelligence analyzed the effectiveness of an advertising campaign in a mall for a two-week period. Path Intelligence discovered that:

- Traffic and sales to H&M during the two-week period were 4% and 3%, respectively,¹³ higher than would otherwise have been expected; and perhaps more importantly,
- The billboards situated on the far side of the mall and close to H&M competitors were more affective at changing the path of shoppers and encouraging them to visit H&M.

Market Vacant Space to Potential New Tenants

Cellphone data also allow leasing professionals to be pro-active rather than reactive in leasing newly-vacated units within each center. Not only can cellphone data help arm the leasing professional with information as to the expected traffic to the vacant store by hour and day, but it can also highlight which stores would work well with the

¹¹ Sharon Biggar, "Calculating Conversion on In-Mall Advertising" (blog post of March 31, 2011 speech at ICSC Fusion Conference), retrieved March 31, 2011.

¹² See, for example, Point-Of-Purchase Advertising International [POPAI] data, as reported by Deborah L. Vence, "Point of Purchase Displays: 'C'mon, Buy Me! I'm Just a Little More Money!" *Marketing News*, Volume 41 (Number 18), November 1, 2007, p. 8.

¹³ Traffic results come from Path Intelligence data; sales data, from H&M. Traffic and sales were both compared to a two-week control period during which no in-mall advertising took place.

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existing list of retail tenants.

For example, suppose that a space within a shopping center had become vacant and that the leasing team was actively targeting the fashion brand Superdry as a potential new tenant.¹⁴

Researchers analyzing the portfolio of malls in the U.K could inform the leasing team that the Superdry store performs best when located in a mall next to:

- Primark (a discounted fashion outlet);
- Subway and Burger King (fast-food units); and
- Game (a computer games shop).¹⁵

Results demonstrate that tenants will have their own (sometime anecdotal) ideas as to their best co-tenants, but quantitative data of the nature outlined above have proven to be very powerful.

Measure the Effectiveness of Mall Marketing Events

Previously, it was difficult to isolate the impact of individual in-mall marketing events. But now, cellphone data can be used to measure traffic to each event, the delivery of new or infrequent shoppers to the mall, and, perhaps most importantly, whether these shoppers stay only for the event or go on to visit the retailers.

The Web, Cellphone Data and the Future of Malls

The Internet has already changed retailing irrevocably. But the rise of online and multi-channel retailing will have continuing implications for the management and design of shopping centers, particularly in terms of the use of space and lease construction:

- 1) *Showrooming*. This trend can be defined as the act of browsing in a bricks-and-mortar store before purchasing an item online. As a result, some retailers are designing their stores to be showcases and actively moving shopper transactions online. Landlords who include a turnover provision in their leases could reduce revenues from those retailers if the online sales sparked by a visit to the “showcase” store are not reflected or attributed to that location.

Cellphone data may be able to assist with this trend.

Imagine a future in which malls are compensated not according to a retailer’s sales, but rather according to shoppers delivered to the store. Cellphone data could be used to measure the traffic to each retail unit and leases could be designed so that rents were based on the number of shoppers over the tenant’s threshold. That is, cellphone data could help the mall industry to move from turnover-based rents to shopper traffic-based rents and in so doing work with retailers to embrace the showrooming trend.

- 2) *The changing nature of anchor tenants*. Several major retailers have announced significant closings, including Sears (100 to 120 store closures in 2012-13)¹⁶ and Best Buy (50).¹⁷ At the same time, other anchor tenants are seeking to sublet space within their own stores. For example, there are now 300 Sephora stores inside JC Penney,¹⁸ and The Bay has announced that it will offer significant space (33,000 sf and 19,000 sf, respectively) to Topshop/Topman within two Vancouver and Toronto locations.¹⁹

These decisions could put the anchor store in direct competition with the mall and affect the tenant mix of the shopping center. If a Sephora store opens inside a JC Penney, what happens to traffic to existing Sephora stores in the shopping center? Cellphone data can assist mall owners in understanding the impact of these “stores within stores” and in identifying new tenants for vacant or underutilized anchor spaces.

Conclusion

Historically, it has been difficult to obtain data on how consumers behave within large spaces such as shopping centers. However, the prevalence of cellphones and other mobile devices is changing that. By using the aggregated and anonymous digital traces that shoppers leave behind, mall owners, developers and management companies can gain unique new insights on how shoppers are behaving inside the mall. The effects of this technology have the potential to be felt in multiple areas: tenant mix, advertising, marketing promotion and leasing. *Smart phones, it seems, can create even smarter malls.*

¹⁴ Superdry opened its first store in the United Kingdom, in Covent Garden, London., in 2004. Since then, it has expanded to 40 other countries.

¹⁵ Path Intelligence data as of late August, 2012.

¹⁶ “[Closings Announced in Dec. 27, 2011 Sears Holdings Update](#),” retrieved September 7, 2012.

¹⁷ ABC News, “[Best Buy to Close Stores, Slash Jobs](#)” (March 29, 2012 blog post), retrieved September 7, 2012.

¹⁸ Sephora, “[Sephora Inside JC Penney](#)” (no date), retrieved September 7, 2012.

¹⁹ The Bay, “[The Bay Announces Two New High-Profile TOPSHOP TOPMAN Locations for Vancouver and Toronto; Capsule to Open in Montreal](#)” (May 11, 2012 press release), retrieved September 7, 2012.

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Sharon Biggar is a co-founder and Chief Executive Officer at the United Kingdom-based Path Intelligence, global leaders in detecting mobile devices and using that data to understand how shoppers are behaving in offline retail environments. Three of the company's products—FootPath, Path Wi-Fi and Flockr—have altered the operation of retail spaces today, changing everything from lease terms to tenant mix to marketing events. The firm, which operates in eight countries, detects over 1 million shopper visits per day. Path Intelligence has been recognized for its innovation and technology leadership through various awards and has been featured regularly in the media including on the BBC, CNN and *The Economist*.

Ms. Biggar's recent report *Time Is Money*, which quantifies the interaction between how long shoppers stay and how much they spend, has been widely publicized in the property press. She has a Master's in Business Administration from MIT, a Master of Arts degree in economics and a Bachelor of Arts and a Bachelor of Music degree from the University of Auckland, New Zealand. For questions related to this article, please contact her at: sharon@pathintel.com.