



Analytics & Customer Research Teaching Case

MALL OF AMERICA GAINS NEW INSIGHTS FROM WI-FI DATA

by Lee C. Thomas & Ravi Bapna

Arguably one of the most significant changes in retail over the past two decades has been the swift growth of online shopping. Initially a novelty, online shopping began to dominate trade news in the late 1990's and early 2000's. Initial unease about transaction security quickly receded, thanks to technological advancement and rapid consumer acceptance of the concept. It wasn't long before online buying and order fulfillment became table stakes for retailers.

Out of this macro trend, two other developments emerged: Retail merchants grappled with a competitive landscape reshaped into a mix of "bricks and clicks." Simultaneously, as online transactions proliferated, the associated data revealed new insights into shopping behaviors. As a result, search engines, online advertising platforms, and retailers found new, data-driven ways to market to twenty-first century online consumers.

At the intersection of these trends are some interesting business questions. Specifically, how might retailers optimize real-world marketing and merchandising strategies, taking cues from what has worked online? What data sources can retailers make use of today, and how might insight from that data change the "bricks" side of the operation? What role can creative problem-solving and analytics play in how large retail organizations shape the shopping experience for today's consumers?

This case encourages students to explore these questions, and to provide data-driven insights to a client organization.

Visit the Location Nearest You

Online shopping changed many things about the world of retail. One thing that hasn't changed — contrary to some prognostications — is that Americans still flock to brick-and-mortar stores daily. To entice people to leave their laptops, many retailers with physical locations strive to enhance the in-person experience and give shoppers something they can't get through an Internet browser or app. Approaches range from redesigned physical spaces to higher levels of service. In-store events, amenities, and

exclusive offers are also used to build on the real-world advantages of being able to see, touch, and try products.



Finding creative ways to bring people into the store is not a new idea in retail. Discount sales, coupons, product demonstrations, and other means of attracting attention are perhaps nearly as old as commerce itself. Modern spins on this idea take different forms — sometimes at larger-than-life scale.

Mall of America: Early Innovator of Destination Shopping

In August of 1992 a new shopping mall opened in Bloomington, Minnesota, part of the Twin Cities metropolitan area. At over four million square feet, Mall of America (MOA) dwarfed other malls, easily claiming the title of biggest mall in the United States. In fact, seven Yankee Stadiums can fit inside the facility.

On opening day, Mall of America contained 320 new stores, including many unique shops and retail chains opening for the first time in Minnesota. But stores were just the beginning: Mall of America also offered nightclubs, a multiplex movie theater, and even a full-scale amusement park (complete with roller coaster and Ferris wheel) under its roof.

From inception, MOA leadership planned a shopping and entertainment destination, one designed to attract visitors from a wide radius. The plan worked: of MOA's 42 million annual visitors, about 40% come from more than 150 miles away. In a given year, 3 to 5 million visitors come from outside the United States, indicating the mall's significant gravitational pull. Tourists from Canada, Latin America, Europe, Japan, Korea, and around the world travel to Minnesota to visit Mall of America.

In the nearly 25 years since opening, Mall of America added to the menu of offerings available to visitors. Now home to 520+ stores, a 1.2 million-gallon sea life aquarium, a transit station, and two hotels, Mall of America has grown even larger (5.6 million square feet as of 2016). The facility hosts more than 400 events each year, including musical performances, celebrity appearances, and charity fundraisers. MOA is a retail

operation now emulated by other properties around the world.

From the Mall of America website:

"The goal has always been to build a destination attraction, much more than just a shopping mall. Mall of America is an unprecedented mix of retail and entertainment, offering visitors the chance to shop their favorite stores as well as see a movie, ride a roller coaster or meet their favorite celebrity. Not only did the concept work, it has surpassed all expectations and changed the way people shop. First in the industry to mix retail and entertainment, Mall of America has become the model for combining signature retail and attractions to create an outstanding entertainment venue and is now one of the most visited destinations in the United States."

Creating a destination and offering guests a special experience is a refrain expressed by Mall of America executives.

"One goal for us is to be the first to offer unique concepts not available elsewhere in the Twin Cities market," says Liz McLay, senior vice president of leasing, citing the addition of stores like Zara, Kit+Ace, and Fabletics as 2016 examples. "MOA wants to have a unique collection of stores that can't be found elsewhere, helping to make it a destination and not just a mall."

"Online competition comes down to convenience. We are trying to layer in a whole suite of services — working with retailers to try things, offering valet parking, and so on — to enrich the in-person shopping experience," explains Jill Renslow, senior vice president of business development.

In 2015 MOA leadership considered whether or not to add a new amenity throughout the building in the form of Wi-Fi Internet access. Given the size of the facility, this



was no small investment. Executives were careful to consider many factors before making a decision.

Large Scale Wi-Fi Installation: Benefits and Risks

For Mall of America, initial discussions about the Wi-Fi idea centered around the benefits it could offer mall visitors.

According to Renslow, “The goal was to offer convenience and a better guest experience. We thought it would help guests to access and navigate the property. Use our wayfinding app to find stores they want to visit. And use the portal page to get guest service.”

At the same time, the increasingly ubiquitous availability of open Wi-Fi networks was a factor. “The decision to implement Wi-Fi was driven by consumer expectations,”

acknowledges Renslow. “As hotels and airlines and others in the hospitality industry offer it, consumers have come to assume it will be available.”

That being the case, there were still significant questions to be addressed.

For example, the physical structure — built in 1992 — wasn’t constructed with Wi-Fi in mind. Adding the necessary infrastructure would be a major investment. (The value of a project of this scope was estimated at approximately \$7 million.) Furthermore, mall leadership did not want to roll out a sub-par system.

“We’ve all had that negative Wi-Fi experience at a hotel or airport,” says Janette Smrcka, director of information technology for MOA. “We were going to do it right or not at all.”

On the other side of the equation was the question of what kind of return might come from the investment. Says Smrcka, “We realized it would be difficult to monetize Wi-Fi and prove ROI. At the same time, guests were expecting it to be there — like they expect a water fountain to be there.”

“It was not an easy decision,” says Renslow. “It took a while.” Considering the question of ROI, she remembers, “Some ideas were to offer the opportunity to sponsor the Wi-Fi or to push ads. We were very hesitant about that.”

From the guest experience perspective, "There was never a question about whether or not to charge for it," explains Renslow. "We were always going to offering it for free."

The desire to satisfy modern consumer expectations was a strong force during MOA's Wi-Fi deliberations. "We came to think of it as a service component with value that would be realized down the road," says Renslow. What form that value would take remained an open question, but one MOA would soon address.

Finding Value in New Data Streams

Committed to providing Wi-Fi for free to mall visitors, and turned off by the idea of selling ads or sponsorships to cover the costs, the MOA team turned its focus to the new opportunities Wi-Fi could enable.

"Two years ago we couldn't experiment with some new technologies because of our physical infrastructure," says Smrcka. "Being able to connect to Wi-Fi like running water or electricity changes that."

In addition to the benefits of Wi-Fi as a utility, the operations and marketing teams at MOA saw potential in the data that Wi-Fi could capture. According to Smrcka, "The value of the data helped marketing and operations sell the idea to leadership."

Given the popularity of free Wi-Fi among smartphone-carrying consumers, MOA predicted that a healthy portion of its daily guests would connect to the network. That could be thousands of visitors signing in every day and generating a data trail.

"I thought, 'I can't have this data and not do anything with it,'" recalls Smrcka.

Renslow concurred, "The question was how to make the data we're sitting on useful?" The team had several ideas. Part of the pitch to the executive leadership was, "Data will allow us to take a step back and reconsider things like wayfinding and positioning of content to best serve the right customers in the right path. It will inform how we use digital signage, and allow us to fine-tune it to provide a more personal experience."

As for ROI, "Overall MOA performance is the ROI," explains Renslow. "It's not directly tied to the Wi-Fi itself. But if we can use the information to get people to stay a little longer or go into one more store, we can see an overall lift."

This service-based approach — using the Wi-Fi data to improve the guest experience so that people will want to stay longer and come back more often — became a guiding principle of Mall of America's approach. With the support of the executive team, MOA made the decision to install Wi-Fi throughout the massive property.

Teaming Up with the Right Partners

An important part of the Wi-Fi strategy and installation was finding the right partner. The MOA team charged with vendor selection considered various options.

Potential sponsor/provider arrangements with telecommunication companies were investigated and rejected, in part because of the mall's strong desire to retain control over the guest experience.

According to Renslow, the team turned to Gartner Research to identify companies with a track record for doing the type of installation MOA needed, especially in large spaces. Installations in sports stadiums became a reference point, given their size. However, it wasn't a perfect analogy: stadiums hold time-limited events only on certain days, whereas Mall of America's Wi-Fi would need to serve guests all day long, nearly every day of the year.

In vetting potential candidates, Renslow remembers, "We considered chemistry, track record of success, willingness to be a long-term partner for something that hadn't been done before. Willingness to make it right for us."

In the end, MOA found that partner in AmpThink, a company that provides Wi-Fi network design, construction, and management in public spaces. AmpThink's client list included several sports arenas and stadiums. The projects had given AmpThink valuable experience managing large-scale connectivity.

From an AmpThink press release about the project:

"The Wi-Fi network we built for the Mall is not just big, but complex," says Bill Anderson, President of AmpThink. "Our Radio Frequency engineers were challenged to develop new methods to calibrate frequencies in order to optimize performance for shoppers as they move in a massive space that has four distinct shopping levels and a large administrative level."

With the decision made, MOA and AmpThink moved quickly to install the hardware. In about 90 days, AmpThink installed 650 access points throughout the facility. The network launched and opened to guest use in October of 2015, in time for the busy holiday season.

Next, MOA sought a partner who could help them understand and make use of the data that began flowing into the servers.

According to Phil MacDonald, information technology business analyst, MOA started focusing on analytics more over the last year and a half. "It's become a big deal in the industry overall. For instance, in the past we knew there were X number of people in the building, but we didn't know where." In a facility as large as MOA, *where* matters quite a lot.

"It's important that we move toward using the data we have — not just collecting it — to improve the guest experience and the business model," says MacDonald.

Smrcka concurs, adding, "We don't have the same data that a retailer has. Wi-Fi gives us a more direct connection to guests."

To augment their internal capabilities, MOA hired a small analytics consulting team to jumpstart MOA's understanding of the data and to begin putting that data to good use.

Gathering Questions to Investigate

To begin, the analytics team had several discussions with MOA leadership about what kind of insights would be useful to the organization. Renslow, McLay, Smrcka, MacDonald, and others at MOA provided input and ideas from various perspectives. An unsorted list of some of the ideas appears below:

Analyzing the Wi-Fi data, can we ...

- Get more accurate counts of the number of people in the building, including in which locations?
- Learn more about what guests do when they visit? This is very valuable.
- Learn more about traffic patterns within the mall, timing of visits, duration, which shops guests go into? This is all information that's already collected for online shopping habits.
- Better customize the MOA experience for four generations of shoppers? Millennials want something very different than Baby Boomers, for example.
- Improve wayfinding and digital signage, including positioning of content to best serve the right customers in the right path?
- Provide a more personalized experience while on site? Provide more relevant offers and promotions to specific guests through finer segmentation? Similar to how retailers like Target and Amazon provide coupons and recommendations.
- Measure the effectiveness of events? Do guests who attend an event leave right away or stay for a while?
- Determine which kind of events are most successful? Learn the best locations and time of day for different kinds of events?
- Provide prospective tenants with richer information about the kinds of shop-

pers who visit MOA? Prior methods have included intercept surveys and secondary research.

- Provide tenants with insight into traffic patterns of guests, including entrance and exit points?
- Refine our strategy for the mix of tenants and where they are located in the facility and in proximity to one another?
- Negotiate beneficial lease agreements?
- Combine that insight with other sales and traffic data to use in marketing strategy?
- Make parking and getting around, finding stores of interest easier for people?
- Get credit for online purchases made on site as a way to combat “showrooming”?
- Proactively dispatch services like restroom cleaning to particular locations?
- Understand synergy or connections between stores? For example, do shoppers who come to an anchor store venture further into the mall?
- Determine if the promotions we run attract guests who actually stay and spend time in the mall?

In compiling such questions, the analytics team began to identify several common categories. But before they could begin to look for insights, the team needed to understand the data coming in, and then organize, structure, and engineer it so that it would be usable and useful.

Mapping Data to the Physical World

MOA and AmpThink provided the analytics team with Wi-Fi data for a five month period. One of the first tasks the team tackled was to map the data to the mall's physical structure. Due to leasing agreements, the MOA Wi-Fi network did not extend into the stores of individual tenants. Therefore the mapping focused on mall entrances, hallways and concourses, atriums, the amusement park, and other MOA-operated spaces.

Other considerations from the outset included the following:

- MOA has four levels plus a basement level used by employees.
- The atriums and other open-air areas might complicate matters, given that mobile devices may connect to an access point on an upper or lower floor.

- A transit station on level one includes a park-and-ride location and a light rail station serving commuters.
- Guests using the Wi-Fi must accept the terms of use via a MOA web page.
- Employees of the mall and its tenants are likely to use the Wi-Fi.

As the analytics team absorbed all this information, the MOA team emphasized that they were interested in any useful insights the team could derive from the data. Rather than a specific problem or question, MOA wanted to understand the possibilities and explore ideas.

Reviewing all the areas of interest MOA cited (pages 6-7), the analytics team determined that not every question on the list could be answered with the available data. The first order of business, then, would be to narrow the list and focus on answerable items that held real value for MOA. To begin, the team asked itself, *How should we structure the project? What is our core problem statement? How will we organize our work to solve the problem?*

Case Questions and Assignment Ideas for the Classroom

1. If you were pitching the idea of adding Wi-Fi at Mall of America, how would you develop the business case? Include quantitative models and other evidence to support your argument for or against Wi-Fi implementation. Consider the \$7 million cost estimate and possibilities for return on that investment.

Imagine you are part of the analytics team working with Mall of America as your client. The nature of your engagement is to derive value from the Wi-Fi data in ways that support MOA's business questions and goals. Address the following:

2. MOA gave the analytics team a variety of questions and ideas for investigation. If you were on the team, how would you articulate a problem statement and tasks to guide your project work?
3. Outline your thinking and approach to deriving value from the Wi-Fi data for Mall of America. Be specific about your methods and justify your approach given the considerations mentioned and MOA's business.
4. Using the case data set:
 - a. Build a way to examine foot traffic patterns.
 - b. Create a behavior-based segmentation of visitors and describe each segment in terms that will be useful to MOA marketing, leasing, and operations.
 - c. Assess the impact of events.

Mall of America Gains Insights from Wi-Fi Data

ABOUT THE CASE

Developed by Professor Ravi Bapna and Lee C. Thomas for the University of Minnesota's Carlson School of Management, in collaboration with Janette Smrcka, Phil MacDonald, and others at Mall of America. Written by Lee C. Thomas.

This case is based on a real, student-led project that was completed in the Carlson Analytics Lab, part of the M.S. in Business Analytics program at the Carlson School of Management. Certain details have been modified for the purposes of the case. Images from Mall of America used with permission.

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