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The Journal of Retail Analytics is published quarterly by Platt Retail Institute, LLC. Articles on relevant topics will be considered for publication.

Request article submission guidelines.

Margot Myers
Managing Editor

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Editor

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Analytic Applications That Transform Retail

Date: March 28, 2017
Time: 9 a.m. - 5 p.m.
Location: Las Vegas Convention Center
In conjunction with Digital Signage Expo
#PRIRetailForum

During this day-long session, Forum attendees will learn how key challenges are being met and how retailers are leveraging data to win in the aisles. Case studies will be presented by leading retailers. In addition, attendees will learn best practices, understand the potential return on these investments, and how to generate actionable insights to improve the customer experience and reduce operating costs.

Click Here to Register!

Plan to attend the Retail Analytics Council Executive Development Program on September 8, 2017, in Chicago, Illinois.

Click here for more information about the Retail Analytics Council.
Industry Snapshot: Retail Sector Performance Charts

The following table and charts provide a snapshot of retail sales performance during the fourth quarter of 2016.

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<tr>
<td>Total Retail Sales &amp; Food Services</td>
<td>0.6</td>
<td>0.2</td>
<td>0.7</td>
<td>4.4</td>
<td>3.3</td>
<td>2.3</td>
<td>4.2</td>
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<tr>
<td>Excluding Autos</td>
<td>0.2</td>
<td>0.3</td>
<td>0.6</td>
<td>3.8</td>
<td>3.1</td>
<td>1.2</td>
<td>3.7</td>
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<tr>
<td>Non-Auto Less Gasoline &amp; Building Supplies</td>
<td>0.0</td>
<td>0.3</td>
<td>0.4</td>
<td>3.5</td>
<td>4.2</td>
<td>4.2</td>
<td>4.6</td>
</tr>
<tr>
<td>Retail Sales</td>
<td>0.8</td>
<td>0.0</td>
<td>0.8</td>
<td>4.3</td>
<td>2.9</td>
<td>1.6</td>
<td>4.0</td>
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Source: Haver Analytics

Chart 1. Retail Sales: Total (Excluding Food Service)

Source: Federal Reserve Bank of St. Louis
Chart 2. Retail Trade: Nonstore Retailers.

Source: Federal Reserve Bank of St. Louis

Chart 3. S&P Retail Select Industry Index.

Source: S&P Global Inc.
Considering the amount of work that retailers put into selling their products, it seems to be a waste if it all falls apart at the point of sale. All too often, consumers who are unable to find their size leave the store frustrated. It has been estimated that up to 75 percent of U.S. consumers have experienced an out-of-stock issue at some point over the last 12 months.1 A product goes through the lifecycle from inspired design, monetized plan, work in progress at a factory, to cargo on a ship being transported across the globe, and finally stocked on a store shelf. What should end up as a successful transaction instead destroys brand loyalty by disappointing a consumer. It is a critical issue for every retailer. There is hope, and at least some of the answers are locked within the retailer’s existing data.

As we started on the path to address out-of-stocks at Levi Strauss & Co., we surveyed denim consumers to assess how stock-outs impacted their shopping behaviors. Internal analyses indicated that one in two consumers was not able to find what he or she was looking for, with over 80 percent of shoppers unable to find products in the right size. The inability to find product in-store was a big source of frustration for our customers. What was a bit more sobering, however, was that a majority of consumers reported that they would leave the store if they could not find their size.

We knew that the problem was neither new nor easy to tackle. At every point in the process, that stretches from the initial design to stocking the shelf, we make decisions and take actions that ultimately impact size availability. There are numerous decisions and processes to improve that can increase size availability. In fact, embarking on this path quickly starts looking like a “boil the ocean” activity.

The first task was to holistically state the problem, and it starts with consumers walking up to a rack with denim, expecting to find their size. Our research indicated that roughly one in three consumers would be unsuccessful in finding his or her size. Here are the most common challenges:

- The desired size is truly out of stock at the store.
- Size is at the store, but misplaced.
- The specific size is not carried in that product or at that store.

While these seem simple enough, each of these issues may have several causes and possible solutions. Each of them requires cross-functional coordination. Each of them has the potential to spur numerous projects and capital investments. The beauty of the first root cause is that it can be quantified with some technical investment using data that most companies, including ours, have readily available. The other two are far more problematic, as they rely on an understanding of consumer intent and consumer experience. Measuring data of that sort, at a consumer level, currently requires heavy investments in surveying and yields moderately accurate results.

In contrast, we had good visibility into inventory at the store level. Even though we struggle with data integrity at the store and size level – meaning we may think we have the denim size, but it’s not at the store, or vice versa – just knowing when our systems were telling us we were out of stock was incredibly helpful.

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The most difficult challenge we faced was determining whether a product was even intended to be in the store to begin with. That is, how do you differentiate between a true out-of-stock versus never-been-stocked? For our initial process, we short-circuited the troubles by using heuristics. We simply asked business partners to put together a “who carries what” list. While this required a little bit of convincing, ultimately it was only a few hours of work twice a year, and the promise of addressing out-of-stocks was enticing enough to make this approach feasible. To further reduce workload and focus our activities, we had teams only list the most important core product that was carried year-round.

With the list of products and stores in hand, our technical teams set forth to build the necessary queries to look for stock-outs at the store and size level. Knowing what percentage of our products had stock-outs was valuable information, but it was an incomplete picture. Not all sizes are created equal and stocking-out of a core size in a high-volume store was far more troublesome than stocking-out of a fringe size in a lower-volume store. We needed a way to differentiate the bad stock-outs with the really bad stock-outs. We wanted a way to quantify the estimated lost sales associated with each stock-out. Answering the question, “What would we have sold IF we hadn’t stocked-out?” is a tricky proposition. The first thing to get comfortable with is that it is a forecast and will always carry with it a forecast error. The important question is to understand how much error is acceptable.

For the ease of simply turning something on and getting results that we could start to examine, we settled on using a moving average of each size in each store’s recent sales as the estimate of what they would have sold. If we found a size in a store with a stock-out, we averaged the last several weeks of sales and used that as the lost sales forecast. In nearly all cases, this amounts to a fraction of a unit. At first, this confuses most people as it is not entirely clear how you could have sold 0.25 units of a jean. However, as the data is aggregated across numerous stores, it makes more sense. It becomes a weighted out-of-stock of sorts.

As we rolled this out, however, teams noticed something that should be apparent to any retailer with any form of seasonal product. Because we were using a simple moving average, our results were understated in December and overstated in January. As we did a moving average of the prior weeks, we were picking up the elevated sales from December and using that as an estimate of what we would have sold in January. To improve confidence in the process and our systems, we made minor modifications to apply a seasonal curve to the moving average estimates.

The first metric that we examined was the percentage of stock-outs, which we calculated as the total stock-outs divided by the opportunities to have stocked-out. As an example, if we had 10 sizes in a product across five stores, we have 50 opportunities to stock-out each day. If we have two stock-outs, we have 2/50 = 4 percent stock-out. That’s a simple and true metric, but it doesn’t tell us much about the nature of the stock-outs.

To understand how important these stock-outs were, we needed to look at lost sales percentage. We calculated that by summing the lost sales and dividing by the sales plus the lost sales. In our example above, assume we had sold 10 units across the 48 sizes/store combinations that had not stocked-out. Further, assume that each of the two stock-outs had estimated lost sales of .75 units each. We end up with lost sales equal to 1.5 units and actual sales of 10. The lost sales percentage is 1.5 / (10 + 1.5) = 13 percent.

The interplay between the two metrics is critical to understanding the nature of the stock-outs. In this case, a 4 percent stock-out has resulted in 13 percent lost sales. This indicates that the stock-outs, in aggregate, were in higher-than-average-volume size and store nodes.

In keeping with the adage of “what gets measured gets done,” we developed reports to surface and communicate this information. The focus of the reports was to create something that was intuitive, easily understand-
Manik Aryapadi is Principal, Strategy & Operation, in A. T. Kearney’s retail practice, with experience in Strategic Operations and Digital Transformation initiatives.

Rene Saroukhanoff is the Senior Director of Merchandising and Reporting Analytics at Levi Strauss & Company.

standable, and most importantly actionable. We set out to generate a one-page interactive dashboard that would give business partners a high-level view of stock-outs and lost sales, but also allow them to navigate intuitively to the most important stock-outs with ease.

We were able to create and deploy dashboards to deliver the data into the hands of two important groups, the sales team that was working with our wholesale customers and the allocators of our owned and operated retail stores. Our sales teams used the data to have conversations with our wholesale customers and help influence how the customers purchased sizes from us in an effort to improve the stock-outs in their stores. For our owned and operated stores, our allocators used the information to funnel inventory into the high-volume sizes and stores experiencing the most troublesome stock-outs.

Measurement was key to our success—not only measuring and communicating the stock-outs and lost sales up front, but also the realized benefits to help reinforce the actions the teams were taking. By comparing the lost sales percentage year over year, we were able to estimate what our lost sales would have been this year if we had maintained the same lost sales percent from the prior year. As another simplified example, assume we had 92 units of sales, and eight units of lost sales. Using our previous equation, our lost sales percent in 2016:

\[
\frac{8}{92 + 8} = 8 \text{ percent}
\]

Let’s assume that our prior year lost sales percent was 10 percent. If we’d maintained that, we can assume that our lost sales would have been 10 units vs. the eight we saw this year. The measurable benefit is two units. Multiplying that by the value of the unit sales will give a rough estimate of the value of the improvements in stock-outs. Measuring and quantifying the benefits is critical to the success of this effort.

At Levi Strauss & Co., we realized a significant sales lift by using targeted analytics to speed up our replenishment processes, improve customer service, and increase consumer satisfaction. The key lessons we learned from these initiatives were the importance of executive sponsorship, openness to new ideas, and bringing all parties along on the journey.

References:
When it comes to generating traffic and conversion, few elements deliver as much value to retail as digital signage. But its benefits are often not realized due to lack of consideration in either the digital or omni-channel strategy.

On the omni-channel to-do list, analytics and impact attribution, inventory visibility, customer visibility/insights, and enterprise-wide e-commerce figure prominently. In-store digital signage is not usually included in the omni-channel program, despite its contributions to traffic and conversion. This may include its ability to drive patrons to the mobile app for engagement, or to the retailer’s website for inventory visibility, product information, online ordering, or browsing.

In other cases, digital signage is bundled into the overarching digital strategy for omni-channel engagement, which retail executives are challenged to support, according to Retail Systems Research.

The key benefit of digital place-based media is that it adds brand and promotional vitality to the facility to attract and hold shoppers while converting browsers to buyers.

Whether visible in the store window, from the exterior walkway, or from a different department in the store, digital signage with strategic content attracts customers and generates in-store traffic. When placed at the back of the store, it deepens the shopper loop.

Using images that promise the fulfillment of needs and wants through the expression of the brand promise prepares customers for discovery and immersion into how the brand will better their lives. Attractive images and messages transition the shopper to conversion, aligning with and supporting supplier and merchant campaigns with product information and promotions.

Dwell time in discovery, assessment, and comparison is a long-standing signal for buying assistance. Digital signage can signal when customer assistance is needed to enable trial/try-on, final selection, up-selling, and cross-selling. Associate time is better utilized when digital signage provides initial information, and stores realize greater revenue and margin results when digital signage is integrated into the sales and service process.

Digital signage at check-out is used by Wal-Mart and others to reduce perceived waiting time and encourage product purchase as bounce-back. It also fuels future traffic and propensity for future purchases. The visit experience is improved as checkout impatience is reduced, and the store benefits when baskets are not dropped, carts abandoned, or items deselected.

Generating analytics in a category or at a point-of-purchase through anonymous viewer analytics can offer insights to messaging success and inform refinement of the display content.

So what is holding digital signage deployment back, especially when the digital signage investment can at times be funded by retail suppliers?

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1 Bounce-back is the action of consumers to leave product pick-up or check-out to add additional items to their basket/order.
Retailers are obsessed with back-office technology investment. Applications such as point-of-sale, inventory management, payment processing, and others require maintenance and their upgrade can often be addressed under the omni-channel umbrella.

Unfortunately, digital signage is seen as a stand-alone or silo application. To gain the benefit of the retail fundamentals of traffic and conversion, the retailers must plan, install, and leverage the digital signage medium. It is too often considered as just a property improvement or a supplier merchandising program, and not integral to improving the shopping experience.

In an August 30, 2016, discussion, RetailWire.com posed the proposition that “Retail executives have no clue about digital.” In the 30 comments that were posted by retail sector pundits, many pointed to the importance of executive support and change management.

Nikki Baird, Managing Partner of Retail Systems Research (RSR) and formerly a principal analyst at Forrester Research, noted in a summary article of a benchmark report the key finding that, “The disconnect is at the executive level, and it comes from having no clue what digital really means to the retail business.”

In citing that most retail executives fall back to the traditional merchandising or marketing learned in their retail experience, Baird said, “The bottom line is this: no substantive change is coming to a retail enterprise unless and until the executive team understands the nature of the digital transformation that is impacting their business. This isn’t about fixing the store, or even ‘creating a more seamless customer experience,’ a phrase I often hear thrown about.” She added, “This is about understanding how consumers are changing their own shopping experiences. This is about understanding how technology – consumer-provided, retailer-provided – will continue to change shopping experiences. And, apparently, until retail executives develop a deeper sense of empathy along those lines, traditional retail will continue to fail to meet consumer expectations.”

In end-user surveys that serve as the basis of reports such as the RSR benchmark study, digital signage is commonly not included as a response option for data gathering. It also bears noting that few benchmark surveys address the use or plans for in-store digital signage specifically.

The RSR benchmark report Retailers’ Omni-Channel Blind Spot: Digital states that, “In 2015, only 11 percent of retailers reported that the primary function of digital was to drive traffic to stores. In 2016, 20 percent of respondents agreed this is the primary role. The percentage of retailers citing digital’s primary role as creating brand awareness has steadily fallen over the last three years, from 20 percent in 2014 to 17 percent this year. On the other hand, the objective of educating consumers about lifestyle elements is a differentiator of the most successful retailers.”

The report says that retail winners have a different set of priorities when it comes to addressing the technology to-do list. It also distinguishes retail winners as “having an executive team that lives digital as much as store” and “a company that is dedicated to modernizing technology and process,” and “uses all the data it can.”

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These are encouraging statements for consideration and use of digital signage within the omni-channel or digital framework for customer engagement.

In the same RetailWire discussion, Sterling Hawkins, co-founder of CART (Center for Advancing Retail & Technology), described the challenges of integrating new approaches, while noting that “Target, Home Depot, Lowes, and many others have learning labs or future stores to test and try out new technologies – the best of which are usually rolled out.”

The challenge for retail executives is to determine where leadership for digital signage consideration belongs in their organizations.

Executive briefings, experimentation, learning labs, and visits to other customer-facing organizations can each improve awareness, comfort, and competencies leading to investment in enabling place-based media. But nothing moves investment forward like designating a project leader to examine and report on the possible return on investment.

When the in-store digital signage strategy finds its place in the retail organization, it also will prove its value in improving customer experience, revenue, and margin achievement.

Garry Wicka is Head of Marketing, Commercial Division, LG Electronics USA, Inc.
Quantifiable Benefits and Analytical Application of RFID Data
A Summary of the PRI Working Paper

In January 2017, Platt Retail Institute and the Retail Analytics Council, Northwestern University, published the Working Paper, Quantifiable Benefits and Analytical Application of RFID Data. This research is sponsored by Avery Dennison RFID, Tyco Retail Solutions, Zebra Technologies, RFID Sherpas, the Council of Supply Chain Management Professionals, and the RAIN RFID Alliance.

The first objective of the Working Paper is to present detailed findings of the benefits associated with RFID technology at a major department store. The second is to demonstrate how RFID-generated data can be integrated with other information to provide retail business insights. According to PRI, this is the most extensive data currently available on the quantifiable attributes associated with RFID at a retail store.

Introduction

There have been deterrents to RFID adoption, including the high cost of implementation, and that it generates more data than can be efficiently processed. Most retailers have not been capable of transmitting, storing, and processing the data that RFID generates. However, the maturing of the technology, along with the reduced cost associated with its implementation and the ability to process large amounts of information, have led to increased retail adoption. In addition, the acknowledgement of the many benefits, the need to develop intelligent digital stores, and an integrated omni-channel customer experience, is fueling RFID implementation. The increase in RFID adoption was the genesis for this 15-month research project.

Use Cases

Department store chain Macy’s provided the primary data upon which the research relies. PRI’s insights into the quantifiable attributes associated with RFID are presented in a series of four Macy’s RFID use cases. A summary of the findings from each use case presented in the research follows.

Use Case #1: Display Audit

The challenges associated with managing display compliance in the Women’s Shoe Department (WSD) at Macy’s is formidable. For example, during 2016, Macy’s carried more than 250,000 SKUs of women’s shoes. Macy’s felt that by ensuring that all styles were visible, benefits could include:

- Sales could be positively impacted.
- Customer service and satisfaction could be positively influenced.
- Markdowns could be reduced.
- Merchants could rely on display compliance data to aid in buying and store allocation decisions.
The desire to reduce the rate of missing display styles and to realize the noted benefits were major consider-
erations that impacted Macy’s decision to pilot and ultimately adopt RFID. The principal operating consider-
ation with RFID was that the incidence of department audits could be increased to five times versus two
times per week (as was the case using bar code scanning). Also, the time involved would be 45 to 60
minutes versus three to four hours per occurrence (again with the use of bar code scanning), thus positively
impacting display compliance.

PRI found that the use of RFID substantially improved the rate of display compliance. The rate of items not being displayed was found to
be in the 4 to 6 percent range, versus a self-reported rate of 30 per-
cent prior to the implementation of RFID. In addition, overall customer satisfaction, as well as the customers’ ability to “find all items,” im-
proved at a faster rate for the WSD than Macy’s stores overall, and it
appeared that more sales and fewer markdowns were occurring.

Use Case #2: Inventory Accuracy

Historically it was estimated that Gross Unit Variance (GUV) in the typical men’s department increased from
2 to 5 percent per month, resulting in a 20-30 percent inventory distortion annually. The company felt that by
implementing RFID and moving toward monthly cycle counts (which could be implemented due to the tech-
nology’s speed in physically counting inventory), it could improve its operations and realize benefits, includ-
ing:

- Improve omni-channel fulfillment.
- Represent all merchandise on the sales floor.
- Improve customer satisfaction.
- Reduce out-of-stock positions due to more accurate reorder points.
- Reduce markdowns.
- Positively impact sales.
- Reduce inventory investment.

PRI’s tests of three brands found that the RFID-enabled brand had a lower year-end GUV than the non-
RFID enabled brands. The tests further demonstrate that GUV accumulates at a 4 to 5 percent monthly rate
when monthly cycle counts of the RFID-enabled brand were not taken. When monthly cycle counts of the
RFID-tested brand occurred, the GUV is maintained in a 2 to 4.5 percent range. In addition, while many oth-
er factors may be at work, the data tends to support the proposition that better inventory accuracy can lead
to fewer markdowns because better buying decisions are being made.

Use Case #3: Single Unit Fulfillment

When a customer order is placed, either online or in a store, Macy’s fulfillment system determines which
store or warehouse should fill the order. Historically, if it was determined that a specific store should fill an
order, the system would only place the order at that store if a minimal threshold of availability was met. The
decision not to expose single units had the potential to result in missed sales opportunities and/or cause
merchandise price markdowns, as the item was not broadly visible to customers online and at other stores.

Macy’s move to single item fulfillment, enabled by RFID, has various benefits including:

- Making single-unit items visible and broadly available both systemwide and to online shoppers.
- Reducing the time to fill an order, and the increased assurance of knowing that a product is availa-
ble, could have a positive impact on the customer experience.
- Positively impacting in-store labor productivity as associates can quickly find RFID-enabled items to
fill an order.
Reducing shipping costs associated with moving a single unit of non-congruent inventory back to its store of origin.\(^1\)
- Positively impact sales.
- Reduce inventory levels.
- Reducing markdowns because product can be more easily located for sale.

In a series of studies, it was determined that the test stores significantly outperformed the control stores in terms of fulfillment requests, units picked, and units sold. A related finding is that this could also lead to transportation cost savings. In addition, testing over a five-month period found that the ability to locate and sell RFID-enabled merchandise is 6.1 percent higher than for non-RFID-enabled merchandise. Testing of the sale of congruent and non-congruent merchandise found that the RFID-tagged merchandise fill rates outperform the non-RFID-tagged merchandise by approximately 3 percent.

**Use Case #4: Back to Front**

The final use case discusses the benefits that can result from utilizing RFID technology to improve the sales floor fill-in process by increasing the amount of merchandise that is represented on the sales floor. By way of background, Macy’s estimates that 13 to 20 percent of all merchandise is kept in store stock rooms. Of that 13 to 20 percent, some 5.5 percent of product that should be represented on the sales floor at any one time is not, in terms of the appropriate assortment of colors and sizes.

The data supports the finding that items placed on display sell at a higher rate than those that are not displayed. The data also supports the conclusion that items put on display, which have not sold during the year, sell at a higher rate than those that are not.

**Integrated Analytical Applications**

In this Working Paper, PRI also illustrates additional applications that incorporate the use of RFID data, which is a rich source of retail information. The following applications are discussed, and models presented, that incorporate RFID data, in combination with other data sets, to produce additional retail intelligence. These are:

- Demand forecasting and merchandise trends.
- Dynamic pricing.
- Fitting room utilization and conversion.
- In-store marketing.
- Merchandise placement.

While many excellent studies have been published about RFID as a facilitator of supply chain management, PRI is not aware of any prior research that considers as extensive an amount of data being made available by a retailer to an outside, independent firm for analysis and publication. We also demonstrate how RFID-generated data can be integrated with other information to provide additional retail business insights.

Download *Quantifiable Benefits and Analytical Application of RFID Data* [here](#).

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\(^1\)Congruent product refers to merchandise that is associated with a specific store. That is, it is stocked in a particular store due to the store’s customer demographics.
As retail continues to endure massive disruption, it is evolving and morphing into new formats, service offerings, and experiential platforms. There has never been a more important time to step back and look at the role of technology from a wide-angle view.

The industry is now littered with labs, cool whiz-bang case studies, and brands elbowing each other publicly to prove that they are the most innovative and category leaders. But are we judging these innovations based on how slick and savvy they appear, or by how they influence what shoppers actually feel while inside the store?

To keep pace with this ever-changing retail environment, retailers must have the discipline to remember that it’s not what we think, it’s what the people we are serving think. Two points to consider:

- Retailers should focus on what should be done, not what could be done.
- Remember that technology is supposed to make things more human, not less.

There is a new breed of shopper in town, and they are not just millennials or another demographic label. Today’s shopper is more about the shopping experience, and not just pure acquisition. We call them ACES: Always Connected, Experience-seeking Shoppers. They are well-researched, time-crunch, peer review-addicted, and not brand-loyal. Technology is ingrained into everything that they do, but the interesting thing is that they crave physical experiences. ACES want to touch, try-on, try-out, taste, and talk. In fact, more than half (55 percent) of online shoppers prefer to purchase from a retailer with a physical store over an online-only merchant.¹

ACES love encountering things that create stories worth sharing. They will often leave a retailer for a competitor if they aren’t excited by the store experience.

¹ A.T. Kearney Omnichannel Shopping Preferences Study.

AT&T’s newest flagship store in San Francisco, opened in October 2016, features two floors of innovative experiences designed to tantalize the senses. This 45-foot display playfully interacts with theme music and reflects the brand’s evolution to an entertainment brand thanks to its acquisition of DirecTV. Photo by MaxMedia.
The retail technologies that partially comprise our innovation toolkit are critical for making or breaking that overall retail experience. Therefore, we must embrace the psychographic mindset of today’s ACES – and also their spend. Let’s first dissect an experience.

An experience is nothing but a set of sensory inputs coming together. Sight, sound, taste, touch, and smell constantly happen around us, yet our brains can only consciously acknowledge a tiny percentage of the overall impression. We don’t know why we feel the way we do when we encounter something new or unique in a retail store, but the subconscious does – and the emotions churning behind the curtain drive what happens.

The challenge for those in digital retail design is that, until recently, it has been very difficult to measure non-conscious feelings. Few, if any, retailers want to create in-store innovations on blind faith. There is a hefty amount of risk in putting significant funds toward a new initiative that may or may not succeed.

Historically, the retail industry was relegated to doing the qualitative legwork of asking people how they feel about a retail experience, then determining how to use that feedback. Most executives had little regard for qualitative research; they instead yearned for the quantitative work. Enter affective science.

Affective science is the study of emotion or affect. It is becoming a secret weapon for retail as more brands come to the realization that what shoppers say, and what they mean, are often two very different things. Using new tools available to us, we can now see what is happening with shoppers "beneath the surface" by unobtrusively monitoring their heart rate, galvanic stress response, eyes, facial micro-expressions, and even the hidden sentiment in their verbal feedback. By doing this, we can overlay the standard qualitative techniques (asking for a response) and use these new tools to uncover even deeper truths.

For example, a fast casual restaurant installed an immersive sound system, hoping that it would make the ambience more welcoming. The goal was to influence customers to spend more quality time in their dining room. The strategy did not work as planned. No one could figure out why the linger-time was not increasing or why many people didn’t sit at certain tables. Had they used affective techniques, they would have quickly discovered that stress levels rose significantly when people sat at certain tables. That would have prompted them to ask why, quickly understanding that the music was vibrating off of the overhead AC ducts in certain areas, creating a high-pitched screech.

Another hospitality brand conducted a traditional qualitative research study and thought that parking was the most important experiential friction point to solve. After all, almost every guest mentioned that parking was a problem. Digging in deeper with cognitive linguistic analysis, it was determined that having Starbucks coffee available had a bigger impact on the overall positive experience. It proved to be a more effective loyalty trigger than fixing the parking situation.

There has never been a more important time to embrace the visceral power of the retail store, and use today’s exciting innovations to push the boundaries of their walls – literally and metaphorically. It is clear that we must re-embrace the notion that focusing on human beings is what it takes to be successful.

As author and civil rights activist Maya Angelou noted famously, people will forget what you said and what you did, but they will not forget how you made them feel. Retail is a world that funds well what it measures well, so finding the intersection between both philosophies is the golden opportunity.

“Affective science is the study of emotion or affect. It is becoming a secret weapon for retail as more brands come to the realization that what shoppers say, and what they mean, are often two very different things.”
MaxMedia’s Emotions per Experience (EpX) Scoring Model

Retail metrics traditionally focus on behavioral and transactional data. However, through the use of neuroscience, wearable technology, and mounting evidential data, there is a third lens of shopper data – and it holds the secret to customer loyalty.

Shopper feelings and emotions dictate the majority of purchase decisions, and it has now been found that giving shoppers positive emotional experiences is the single most significant driver of customer loyalty. This information has given rise to a new discipline – measuring emotions in retail spaces. The ability to measure and promote positive shopper emotions across multiple retail touchpoints – from the parking lot to the checkout line – is now a critical skill in helping retailers survive and thrive in an increasingly digital-dominated world.

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*2015 Temken Consumer Benchmark Study (293 Companies and 10,000 Consumers).
In an odd twist, a massive high-tech investment in omni-channel, big data, and IoT is taking retailers back to the future – back to something they used to know and do well: creating relationships with their customers.

Older generations grew up knowing their local grocer, butcher, and pharmacist. It was personal. They knew their customers’ needs and met them, and business was built and run on word of mouth – the original social media.

Then the pendulum swung, and retailers lost touch with their customers because of mass merchandising and big media. Brands and advertisers developed the theory of reach and frequency, and built a whole economic structure around mass media that went like this: bombard enough people with messages and the relatively small percentage of individuals who respond to the messages will be enough.

Today, soulless high technology is, ironically, getting retailers back to the old level of intimacy they once had with individual customers. We may be using technology and the Internet of Things (IoT) to get there, but in the end, retail is a high-touch story, not a high-tech story. We’re using purchase histories and data analysis to re-establish that relevance and recency.

The more we can relate to consumers at a specific time with relevant information, the greater share of mind we gain, and the greater the opportunity to influence purchases.

Three Big Changes

There has been a wave of change in the past five years, notably in three areas:

1. **BYOD (Bring Your Own Device)** – Smartphones are now ubiquitous, and 40 percent of shoppers now want to use those devices when they are shopping to compare prices, scan QR codes, and look up alternatives. The in-store experience and dynamics have changed. Now that people can shop anytime and anyplace, retailers and brands know they need to be present in the digital space as well.
2. **Endless Aisles** – Retailers are trying to do more with less – offer more variety, greater selection, and better experiences, but with less square footage. This means smaller on-site inventory and fewer back shelves. The concept and practical application of endless aisle enables retailers to tell shoppers, “Sure, if we don’t have that here, we can get it for you, with no fuss,” and then deliver in a way that is fast and convenient.

3. **The Internet of Things** – Sensors, anonymous cameras, and mined data (i.e., from loyalty systems) all offer the potential to influence shopper decisions and boost customer experiences. Between archived and real-time data, messaging can be shaped and triggered based on what is happening in stores, in a particular time window, to the general profile of the shoppers.

For example, a shopper goes to a big box electronics store to buy a smartphone. The store is busy, so that shopper checks in at a kiosk by tapping his existing phone or a loyalty card. That check-in notifies a sales associate, who then has information in front of him that shows the purchase history and plans for phones. That means the associate understands the shopper’s likely needs and interests at the start of the conversation. It is naturally going to lead to a better experience and service delivery.

Using technology and data to deliver customer service like this can bring retailers closer to the kind of relationship the grocer or butcher had with customers back in the days before smartphones. The more customers know and trust sellers, the more information they will be willing to share, and the higher likelihood browsing will convert to buying.

**The In-Store Brand Experience**

Brands are building stronger presence in stores using the “store within a store” concept. Fashion brands have done this in department stores, while consumer packaged goods and cosmetics brands operate in supermarkets and drug stores, mainly with displays.

Now brands are branching out into other venues as well.

The old way of bringing people into stores was with mass mailings that marketers knew would be ignored by 99 percent of the recipients, but would still bring in 1 percent to move the sales needle.

Now, marketers are starting to target stores where they have particular opportunities to grow sales. Retailers are investing larger amounts of money in those locations to offer the information and services that bring people through the doors and make them want to come back.

**Digital Signage in Retail Environments**

Screen-rich environments are playing a big part in the increasingly interactive store shopping experience:

- “Public screens” deliver one-to-many messages. You find these on the aisle, over the aisle, or even worked into the décor as part of the millwork; they don’t have to be a “screen on a stick.”
- “Private screens” deliver one-to-one messages and are the best vehicle for customer service. These are the mobile phone screens or interactive touchscreens where individual shoppers can download information and receive personalized offers, support, or instruction.

Some screens can do double duty.

Interactivity and delivering experiences that are just functional, or big and memorable, can drive tangible returns. The high-end Burberry apparel brand designs and executes some of the best examples in retail of screen interactivity. At the brand’s London flagship store, they have created an entirely new shopping envi-
environment that drives shopper’s senses and emotions through big, immersive digital visuals and sound. Imagine shopping for a famed Burberry raincoat while the store erupts in thunder and virtual rain pours down the store’s video walls.

There’s a similarly great use of digital screens in the Victoria’s Secret Herald Square store in New York. Using a set-up powered by ComQi’s EnGage software platform, the store’s visuals include a three-story video wall, with synchronized screens that seemingly follow shoppers up and down the escalators.

**The Digital Store is Steadily Evolving**

The digital elements of retail brick-and-mortar environments will continue to evolve.

They will get steadily smarter, as more and more data becomes available, gets harmonized and then used to trigger and tailor messaging to the shoppers. There is a fine line between personalization and invasion of privacy, but smart retailers will know how to stay on the right side of that line.

The display canvas will change as new technologies come into the market. Already, the LED technology that used to clad the outside of big retail spaces is coming indoors – with higher resolution LEDs (called “fine pixel pitch”) used as video walls, replacing LCD versions.

There will be more wearables, used as tools by store staff to better serve customers – because associates will have shopper purchase histories, buying habits, and other data on their wrist, or showing up in front of them through smart glasses.

There will also be more of a relationship between the little screens in our hands and the big ones around the stores – using augmented reality to provide deeper details, tips, and tools such as NFC tags and bar codes – to allow shoppers to seamlessly load information from the big screen, to their phones.

**High Tech is High Touch**

Smart retailers know applying technology in a retail environment is not about the tech itself. It is about what is done with technology. If retailers can use all that amazing technology and data to improve the shopper experience and build relationships, that is the high-touch solution that will drive sales and loyalty.

Stuart Armstrong is the Group President and Chief Revenue Officer at ComQi.
The Future of Retailing – A Revolution to Technology

By Walter F. Loeb, President, Loeb Associates, Inc.

The Future is Now

Retailing has undergone a revolutionary change. Merchants are no longer the driving force as the retail industry has moved from a merchant-driven industry to a technology-driven industry. This is a major change that some retailers will find hard to accept. In the past, merchants interacted directly with customers. They talked to them and could observe in-store shopping patterns. Now these same customers are demanding products and services that better match their personal needs. In other words, the customer is now in charge.

Retail culture has been slow to accept disruptive ideas and now retailers must more rapidly incorporate the influence of technology. Resistance to understanding and providing new shopping experiences to customers may determine survival in an increasingly competitive environment. Technological advances, and there have been many, will make shopping easier. They include robotics, personal recognition, mobile payment/digital wallet, digital developments, artificial intelligence, consumer analytics, and other means to make shopping exciting both in stores and on the internet.

Retailers like Macy’s, Nordstrom, and Neiman Marcus have installed Magic Mirrors, smart fitting rooms and special features on the internet like Nordstrom’s Trunk Club and Neiman Marcus’s Mytheresa, both online luxury shopping sites. There are exciting digital developments at Wal-Mart and especially at Target stores.

Stores Within Stores Will Increase

Looking toward the future, retailers will change their attitudes, for example, there will be more concessions in stores. Specifically, fashion department stores like Macy’s, Bloomingdale’s, Niemen Marcus, Nordstrom, and others will strive to reduce their inventories by making more pacts with leading vendors to take over the selling space. European stores have as high as 60 to 70 percent of selling space allocated to concessions while in the U.S., it is only 8 to 10 percent. Recently Macy’s converted to concessions for athletic shoes (Finish Line), caps (Lids) and sunglasses (Sunglass Hut), while Bloomingdale’s has designers like Armani as a concession. It assures the store management of a steady stream of fresh merchandise.

Management Teams Will Be Smaller

Another prediction is that there will be fewer C-level (e.g., chief financial officer, chief marketing officer, etc.) positions in stores. Companies will cut costs and consolidate responsibilities. TJX Companies is a terrific example as an off-price leader with only a small management team. While it is easy to elevate executives to a
C-level position, it is much harder to consolidate. Technological advances will provide management more information about their customers and sales. Executives who are best able to analyze this data will become vital members of C-suite teams. Today, one must also have an organization where associates are willing and able to assume more responsibilities than ever before.

Apparel Departments Will Shrink

By 2020, most apparel departments in department stores will shrink again. Department store management must realize that their profitable growth will come from center core departments such as handbags, jewelry, watches, and cosmetics. While in apparel, junior clothes will still be important, other areas will shrink in importance. Recently, J.C. Penney started to sell appliances again. This is an effort to build customer traffic in their home store. Appliances are now in 500 J.C. Penney stores. While these sales have lower profitability, they will help revive home business.

Internet Sales Growth Will Slow

The internet is in its greatest growth phase. It has lower profitability due to the competitive nature of internet sales. To maintain virtual sales volume, retailers feel they must give extra discounts and offer free delivery. Retailers must strive to sell staple merchandise. By 2020, growth of internet sales will slow and many companies, from Amazon to Rent the Runway, will have physical stores in which to sell their wares.

Smart Retailers Will Focus on Needs of Gen Z and Millennial Customers

Much of the future is based on how Generation Z and millennial customers will act. And while the millennials continue to be uncertain about their future, right now many do not want to own anything of value. They are looking for value offerings. In contrast, Gen Z is interested in new products. They shop more in stores and will share information about their purchases. Thus, they will have a major impact on the future of retailing. For both groups, interaction using social media is vital. This is a great opportunity for retailers.

Both millennials and Gen Z shop in outlet stores. These are the bargain basement stores of yesterday and these outlets will grow rapidly, particularly if they offer quality merchandise at a good value. Whether it is T.J.X’s T.J. Maxx, Macy’s Backstage, Nordstrom’s Rack, Ross Stores, or Bloomingdale’s Outlet store, they will all fight for the consumer dollar. Famous brands will always be important to outlet stores.

Retail is exciting and something new is always happening. However, innovations must target desired customers if retailers are to survive in a rapidly changing environment.

“\[quote\]
The internet is in its greatest growth phase. It has lower profitability due to the competitive nature of internet sales.\[quote\]”

Walter F. Loeb is the President at Loeb Associates Inc.
At a time when almost anything can be bought online, brick and mortar retailers must use creative strategies and advanced technologies to create dynamic, media-driven environments that make shopping in stores more appealing and engaging.

While traditional retail marketing is facing many challenges, advancements in digital signage, video walls, and interactive displays are ushering in many new opportunities to attract and engage shoppers. When deployed effectively, this “experiential digital signage” can reinforce store branding, promote customer loyalty, and boost sales and revenue.

The key to effectively engaging shoppers through experiential digital signage is to develop a strategy in alignment with in-store marketing goals. If the goal is to create a unified impression across multiple retail locations, departments or areas, then an ideal approach is to configure a system for centralized content management, with targeted IP delivery to networked media players across displays, kiosks, and/or video walls.

If the goal is to entertain shoppers, consider a digital signage system that provides multi-zone screen display where each zone of the screen can present different content. This could be video or media assets produced in-house, mixed with external media and data sources. For example, the screen can be divided into zones filled with moving video, photos, Flash media and animations, logos, clocks, event calendars, graphics and text, and even live television. Tickers and crawls can run along the bottom of the screen to announce news headlines, sports scores, weather alerts, and other data streaming via RSS and XML feeds.

There is also a useful wayfinding element to explore. Digital signage can prove valuable to the “what, when, and where,” guiding shoppers as they explore merchandise and consider whether to purchase or pass. A flexible content creation platform with targeted distribution can bolster the experience, disseminating relevant content tied to product information, sales incentives, and video tutorials. This strategy is further enhanced when the network includes strategically positioned interactive touchscreens and kiosks that direct shoppers to the right aisles and products to influence buying decisions.

Digital Signage and Shopper Activation

Digital signage has reached a new benchmark for integration into the larger retail experience, including shopper personalization. That personalized approach can be achieved by leveraging APIs that enable the systems to interface with third-party technologies such as advanced retail analytics, data tracking platforms, RFID (radio frequency identification) technology, and biometric scanners.

RFID is a technology that is capable of identifying a unique object, such as a product on display. Unlike scanned barcodes, RFID systems have an antenna/transceiver that uses radio frequency waves to transmit a signal that activates a transponder or tag. Once activated, this tag transmits data back to the antenna, which can potentially initiate other automated processes or transactions. Using RFID data that identifies a shopper activation related to a product can then trigger specific digital signage content, making shoppers feel special and valued.

Biometric scanners represent another personal recognition tool that can tie into sophisticated digital signage systems. These scanners tend to profile a person in broad brushstrokes, such as males 40 to 50 years old.
Using that information, the digital signage system can display content specifically suited to that demographic profile.

While these technologies can greatly personalize and enhance the shopping experience, one of the biggest challenges going forward is how to make it feasible and affordable to use them in conjunction with digital signage systems, especially for large-scale deployments.

Many retailers now use advanced analytics to track and understand how their merchandise moves around the store as people shop, what items made it to the checkout, and what’s been left on fitting room hooks. When digital signage systems are used in combination with these platforms, shoppers may now start to see digital signage messaging that is personalized for them.

**Mobility and the Retail Experience**

Downloadable apps offer another emerging means for retailers to connect with customers. A prime example is using the store’s Wi-Fi network to receive timely information via a retailer’s app, such as the arrival of new merchandise or an exclusive sales offer while shopping.

Naturally, the customer’s mobile phone or Bluetooth device must be active when the store sends out a push notification about the availability of the app, or they will not know to download it, potentially resulting in a missed sales opportunity. Digital signage displays offer a call to action for shoppers to download the app, along with other incentives they may have missed at first yet still have an opportunity to seize.

While walking through the store, this digital signage message could catch their eye: “Did you know you can download our free mobile app to get special sales offers?” Then, once downloaded and terms and conditions accepted, their information could be used right then and there – and stored for future use.

For example, let’s say that through PoS (point of sale) analytics that John Smith was in the store at a certain time and bought a pair of shoes. The next time John is in the store, the digital signage could use John’s shopping history to display a unique message just for him, “Check out our half-price sale on running shoes – today only.”

**Tailored Approach**

There is no right or wrong approach when deploying a digital signage network, as every store is unique. This is especially true when deployed as part of a larger retail experience. Retail management, in-store design companies, and other experts that understand consumer-shopping behaviors on larger installations all play substantial roles. This is also a significant reason why digital signage in retail is a much more complex endeavor than in other business verticals, where we traditionally engage mainly with marketing departments.

Decisions need to be made about key issues, such as where to place the displays, screen size and dimensions, angle or orientation, and the availability of power and local area networking. A well-designed, flexible digital signage system – utilizing a network of media players – should be able to adapt to any plan, and deliver content in a way that is optimized for a wide variety of screens.
The more flexible digital signage software on the market enables businesses to tailor media content for proper display on smaller screens, such as Android smartphones and tablets. That content can also be magnified to higher resolutions for display on interactive kiosks and touchscreens, all the way up to big-screen LEDs, video walls, and storefront landscape or portrait displays that can display 4K and even higher resolution UHD content. Today’s leading digital software should be limitless in regard to resolution support.

**Ensuring Efficient Operations**

It is important to make sure the signage system chosen for a particular installation scales to the number of displays that ultimately need to be deployed. Does the retailer want to make a big splash by concentrating a lot of digital signage displays at just a few busy, flagship stores? Or, would the retailer prefer to have fewer displays in any one place, but spread out across more store locations?

Digital signage can create a consistent, unified message with branding that ties different locations together. However, retailers must consider the scale of their digital signage installation, which will impact the level of capital investment.

Signage systems should have a very user-friendly software interface and an intuitive workflow that won’t intimidate employees. This enables the retailer to keep signage operations in-house to further reduce operating costs.

The digital signage system chosen should offer simplicity in template creation, media uploads, multi-zone display composition, and playlist management among other common digital signage tasks. The interface should also enable easy management of content dissemination to media players, including the means of designating what playlist or content should flow to which players. When a digital signage system assigns a particular tag to a player, content with the same tag will find its way to the corresponding player or group of players. This addressability gives retailers creative freedom and operational control over the way content displays on all the screens throughout the network.

Digital signage can be considered the voice of the retailer, speaking directly to customers and maximizing in-store sales opportunities. It is more than simply advertising or gathering information about individual shoppers; it is about leveraging that information at the point of sale to tailor a digital signage message that is relevant to that particular shopper’s needs and interests. The right digital signage system – especially when paired with other advanced technologies – can completely transform the retail marketing experience, making it more rewarding for everyone.

> “Signage systems should have a very user-friendly software interface and an intuitive workflow that won’t intimidate employees.”

Jeffrey Weitzman is the Director of Business Development at Navori Labs.
Platt Retail Institute undertakes a variety of research projects throughout the year. The results of this research are published as Research Articles (available for free download from the PRI website with registration). Some of the available PRI Research Articles include:

“Customer and Inventory Insights Generated by Location-Based Analytics, and the Introduction of an Online – In-Store Behavioral Bonding Model.” Commissioned by Tyco, this research article explains that with the rapid changes in shopping behavior and especially the relationship between online and in-store consumer activities, it is highly important for retailers to make technological investments in an integrated information platform.

“Deployment and Test of the Digital Life Experience at an AT&T Retail Store.” This research, sponsored by Lighthaus Logic, describes a test conducted by AT&T in its Arlington Heights, Illinois, retail store. The test was designed to determine if having a more robust user experience in an interactive environment would lead to increased customer adoption and sales of the Digital Life service, an AT&T technology that encompasses a variety of home security and home automation options.

“The Future of Retail: A Perspective on Emerging Technology and Store Formats,” was released in conjunction with the PRI Retail Forum at Digital Signage Expo 2014. This research, sponsored by Two West, examines the history of retail in the U.S., emerging technology that is impacting retail today, and how retail store formats will change in the future and integrate various digital technologies. The goal of this Research Article is to inform the reader about the disruptive changes occurring in the retail industry, and to help retailers prepare for and embrace evolving retail formats and technologies.

“Retail Attitudes and Adoption Trends of Multi-Channel and Omni-Channel Marketing,” was research undertaken to gain insights into retailers’ attitudes about multi-channel use and the adoption of omni-channel marketing strategies. While most retailers use multiple channels to reach their customers, it was noteworthy that the retailers who participated in this research expect email and mobile marketing to increase in importance while the physical selling location is expected to fall. This research was sponsored by Digital Signage Expo.

“Digital Signage’s Role as Part of a Multimodal Approach to Deliver Emergency Messaging on Campus,” explains the rapid adoption of digital signage networks as an important communication tool on university campuses. In 2010, PRI released a Research Report, "Communication Effectiveness in Higher Education," which illustrated that digital communication networks (DCNs) are becoming a viable alternative to older forms of on-campus communication. PRI conducted additional research, sponsored by Digital Signage Expo, Four Winds Interactive, Intel, and NEC Display Solutions, to delve further into the role of digital signage in delivering emergency messages on campus.

“The Media-Saturn In-Store Digital Experience,” is an extensive case study that details the technologies, management, and unique software that European retailer Media-Saturn built to create, manage, and distribute content in different languages across its network. Not only is Media-Saturn Europe's largest electronics retailer, it arguably has the most advanced, complex customer-facing technologies of any retailer in the EU. This research is sponsored by Digital Signage Expo and Intel.
## PRI Working Papers

*PRI is the leading publisher of tactical research in the area of In-Store Marketing and Digital Communications Networks.*

With the assistance of leading academic institutions, PRI publishes groundbreaking industry research related to in-store marketing, digital communications networks, and more. PRI Working Papers may be downloaded for free with registration.

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With the assistance of leading academic institutions, the Platt Retail Institute publishes groundbreaking industry research related to in-store marketing and digital communications networks. These are published as either Working Papers or Research Articles. In addition, PRI seeks funding for other unique projects.

Sponsorship of PRI research offers a variety of benefits. These include establishing the sponsor as an industry thought leader, creating various promotional opportunities, and enabling the sponsors’ association with the leading research and consulting firm in the field.

Sponsorship opportunities include:

1) Digital Retail Forum
   March 28, 2017 in Las Vegas, NV
   Event begins the day before the Digital Signage Expo.

2) Journal of Retail Analytics (quarterly)

3) Working Paper and Research Article sponsorship benefits can be customized, but generally include the following:
   - The right to distribute copies of the research.
   - PRI will present the research on behalf of the Sponsor.
   - In the front of the Paper/Article, a description of the Sponsor's firm and a firm logo will be presented.
   - On PRI’s website detailing the research, the Sponsor will be noted and its logo will be listed.
   - Leads from downloads on the PRI website will be provided to sponsors.

Contact PRI for information about sponsorship opportunities.
Industry Events Calendar

February 7-10, 2017
Integrated Systems – Europe
RAI Amsterdam Exhibition Centre
Amsterdam

February 27-March 2, 2017
eTail West
JW Marriott
Palm Springs, California

March 12-14, 2017
SPECS: The Retail Event for Store Innovation
Gaylord Palms Hotel
Kissimmee, Florida

March 20-21, 2017
Re!Think
Hilton Midtown
New York City

March 21-22, 2017
Internet of Retail EMEA
Doubletree by Hilton Hotel
London

March 28, 2017
PRI Digital Retail Forum
Las Vegas Convention Center
Las Vegas

March 28-31, 2017
Digital Signage Expo
Las Vegas Convention Center
Las Vegas

March 28-30, 2017
Global Shop
Mandalay Bay Convention Center
Las Vegas

March 29-31, 2017
Neuromarketing World Forum
Venue TBA
London

April 26-28, 2017
Retail and Consumer Goods Analytics Summit
The Drake Hotel
Chicago
Have an article idea for the Journal of Retail Analytics?
Contact, melissan@plattretailinstitute.org to receive the Publication Guidelines.

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