

2018 Retail Technology *Innovation Index*

EnsembleIQ's inaugural report, an index of technology companies that present innovative solutions in support of a dramatically changing retail landscape.

17%

average spend on innovation for both business and IT programs as a percentage of retailer's total revenue.

Enhancing customer satisfaction, identifying growth opportunities and reducing operational costs are the top three drivers for innovation investments in retail.





Why retail innovation?

Retailers, brands, agencies, digital companies, social platforms, mobile ad providers, retail display companies (and the list goes on)—innovations and disruptions come from many partners in retail, and they have for years. But today is a decidedly different day.

Consumers have more power than ever and increasingly want more and more from retailers and brands, requiring non-invasive, rapid-fire, personalized and friction-free retail experiences digitally and in-store. Current and future retail business survival is intricately tied to this shopper evolution, and all those involved need to be agile and innovative.

Retail technology is the key to keeping up with this new consumer. When armed with the latest advancements, technology companies are in a position to help retailers attain a stronger customer focus, and build an ROI- and TCO-led approach. The challenge for retail is navigating the innovative technologies, knowing the providers and getting them all in place.



2000-01

Advent of web-based search and the beginnings of social media.



2003-04

Retail embraces social media; use of store data gains prominence.



2009-10

Retailers start using cloud-based technology to drive business decisions.



2014-Present

AI, IoT and Big Data join forces, allowing decisions to be made in real-time.

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1.

Consumer-Driven Changes in Retail

Innovation and the ability to roll out disruptive business models in retail were tall tasks in the past due to a lack of internet infrastructure, internal retail organization bureaucracy and a weak consumer adoption curve. However, in the last two years, there have been great strides by retailers to answer the call from consumers for a friction-free shopping experience. Walmart, for example, is consistently testing new ideas. It has tried lockers inside stores to make picking up online orders easier and rolled out automated pickup towers. It has tried Lyft and Uber for deliveries. And it has leaned on its innovative tech subsidiary, Store No. 8, which launched Jetblack, a service that enables shoppers in New York to buy recommended products through a text message.

Walmart and several other retailers are responding to the consumer. Both brick-and-mortar stores and e-tailers that show innovation and attempt to ease the consumer shopping experience can expect to see loyal shoppers. In fact, 80% of customers would spend more money at such a retailer, 35% would spend more per week on an average².

Future customer experience programs initiated by companies such as Walmart, Target, The Home Depot, Ulta Beauty, Sephora, Aldi, Amazon and Kroger are aided by strong consumer adoption. But these programs are not just for these large companies. They are for all retailers that are willing to take measured risks and invest in a customer-first approach. This will enable true, sustainable innovation in retail and robust consumer adoption. The U.S. retail industry's success lies in figuring out how can more companies benefit from the innovation experience of leading retailers and find a way to move as fast as "new age" retail companies despite budget-induced, organizational or other challenges.

"Our group's focus has evolved from understanding the shopper to looking at the end-to-end customer experience from the point of view of the customer – not operations, not business, not what we think, but what the customer thinks."¹

Jamie Sohosky, Vice President,
Marketing and Customer Experience
at Walmart.

1. Bill Schober, "Hall of Fame Profile: Jamie Sohosky," Shopper Marketing, April 16, 2018, <https://shoppermarketingmag.com/hall-fame-profile-jamie-sohosky>.
2. EnsembleIQ Retail Consumer Survey 2017 (n=1013, 2017)

For customers, a major frustration with the overall shopping experience is not store or channel dissonance but experiencing a satisfactory end to the shopping trip—how they interact with pricing; how they checkout and order. In order to increase innovation in stores, retailers must introduce more disruptive retail engagement models focused on not just the steps but the emotions of a shopping trip.

Retailers who predict what the shoppers want in the shopping journey and deliver it appropriately by creating innovation incubation programs, organizational strategy, and partnering with agile and innovative solution providers are winning market share. For example, shoppers want more appealing multi-utility shopping choices, attractive new categories, new user-friendly store designs, faster checkout, digital payments, excellent service and a location that is informative and experiential. The end-to-end customer experience needs re-engineering in order for average and laggard retailers to become innovative and friction-free.

Retail disruption

- Retailers are unable to catch up with customer habits.
 - Several new customer engagement models have popped up.
 - Technology is at the center of this change.
 - Retail is more consumer and market-trend-driven today than ever before.
 - Retail sectors are constantly shifting.
-

The customer is also driving growth in new types of stores, digital and marketplace shopping, and subscription business models. Customers are also affecting growth in off-price and discount shopping (both food and non-food segments).

The young, digital shopper is gradually driving change toward more enhanced digital grocery and multi-retail segment subscription box shopping experiences. They include recipe inspirations from BuzzFeed's Tasty videos, delivery apps such as Postmates or Instacart, and subscriptions boxes such as Mantry, Farm to People, Carnivore Club, Rockets of Awesome, Birchbox, Harry's and others. The grocery category is, of course, a slower mover than digital shopping advancements in categories such as beauty (with AR-enabled virtual try-on apps), shoes, music, apparel, home and household, and electronics, but it's all building toward a new norm of shopping.

Customer experience re-engineering



- Before reinventing stores and operations, best-in-class companies adopt agile customer innovation.
- Transforming stores requires agile models to reimagine and reconfigure customer touchpoints.
- Digital transformation requires embracing a digital mode of commerce across customer and operational touchpoints.
- Best-in-class companies create customer-centric merchandise roadmaps all the way to the UPC/SKU level.



I. How are retailers responding to change and disruption?

Insights based on EnsembleIQ Retail Innovation Survey 2018

If retailers want to increase creativity and satisfaction through the shopping experience and be considered innovative in terms of providing a friction-free shopping process and, in turn, continue to bring people into the store, they need to make profound shifts toward newer relationship models, drive scalable disruption and social change, and be far more intuitive than they are today. Shoppers tell us that a crucial part of being more friction-free is making the entire shopping process easier and faster.

According to a survey by EnsembleIQ³, if shoppers were to create their own friction-free shopping experience, a hassle-free checkout would be second only to attractive prices. For young shoppers, this distinction is even more prevalent.

As retailers look to disrupt the industry, there are more challenges. There's retail fragmentation, for example, including the variety and velocity of format and channel changes. Digital and subscription models are good examples, but format and channel changes go even deeper into actual categories. Some retailers have already transformed significant parts of their business model and operations completely to fit the new normal.

5 essential steps to innovation



When comparing the digital experience and the physical experience, shoppers define “friction-free” differently.

*For instance, the EnsembleIQ study shows that the top verbatim reasons a shopper leans toward a best-in-class, **brick-and-mortar store** are checkout options, ease of **in-store ordering**, **self-checkout** and **easy overall shopping**.*



Affordable and Expansive Internet Infrastructure



New Customer Experience Models



Product Introduction



Market Foresight



Agile Business Decisions



For online retailers, the reasons a shopper prefers a best-in-class e-tailer are free shipping or delivery, accurate ordering, a mobile app and a variety of payment options.

3. EnsembleIQ Retail Consumer Survey 2017 (n=1013, 2017)

Constant new product introductions also put additional stress on stores. Best-in-class retailers are taking on new strategies when it comes to product introductions pivoting to digital to increase overall assortments and the number of choices facing shoppers. It becomes a question of where else to invest as digital becomes more of the center of retail. Other related issues include private-label growth, adjusting assortment and inventories around profit-friendly private labels. And there's the fierce pace of pricing shifts with an increase in off-price models that suit low-and mid-level income consumers.

When it comes to innovation, **EnsembleIQ's 2018 Retail Innovation Survey** (n=200) shows that most retailers consider themselves ahead of their competition. But, such a finding seems arbitrary as a majority are not even measuring the impact of innovation on their organization today. This is a gap that retailers need to fill relatively quickly if they want to be ahead of the curve.

Retailers consider innovation important for their business

Retail performance when it comes to innovation and disruption

58%

Better than our competitors

36%

At par with our competitors

6%

Lagging our competitors



6 in 10

retailers consider themselves better than the competition in innovation and disruption.

Measure the impact of innovation

41%

Yes

30%

Intend to measure in the future

29%

No

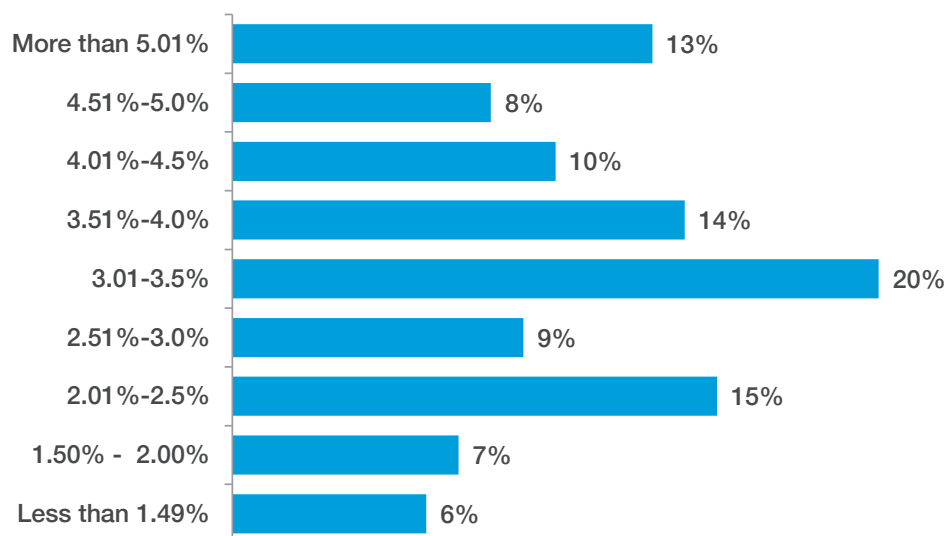


4 in 10

retailers measure the impact of innovation on their businesses.

How technology aids innovation

% spend on information technology, annually



% distribution of technology budget, 2018

49%



Maintaining existing systems (includes IT operations and staffing)

29%



Developing new systems/innovation

22%



Research and development (R&D)

On average, 4% of retail revenue is spent on information technology annually.

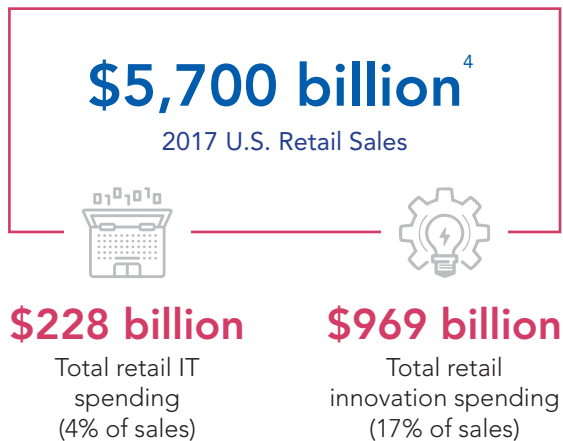
According to EnsembleIQ⁴ data, compared to businesses such as financial services, travel, hospitality and healthcare, the retail industry spends far less on technology and technology-led innovation. In fact, retailers spend 4% of their revenue on technology.

This portion of funding is putting CIOs and their IT staff in a tough position to tackle three major challenges, as identified by half of the retailers surveyed: managing legacy systems, working with a lack of skilled resources, and implementing new systems.

Retailers, however, spend 17% of their total revenue on innovation that includes both business and IT programs. They are spending close to \$228 billion annually on IT, but expenditure on overall innovation is far greater, according to EnsembleIQ data. The main reason for this dissonance is a low reliance on technology-led innovation. Business processes and technology are both critical to innovation.

These decisions no doubt fall to a company's key decision-makers.

Retail technology and innovation spending



II. Who decides on innovation?

Insights based on EnsembleIQ Retail Innovation Survey 2018

When looking at the decision-makers in retail, as in the case of the Internet revolution, the growth of mobile, and the rise of omni-channel over the last decade, shareholders are pushing CEOs to take charge and infuse a comprehensive and agile innovation program into their companies.

For 4 out of 10 companies, that mission is being filtered down to the CXO, the head of IT, the head of retail operations, the head of E-commerce or chief digital officer, or the head of marketing. The idea is to get innovation across all areas so it is executed in stores, in the supply chain, in the digital customer engagement, and in all segments.

EnsembleIQ data found that more than one third of the retailers surveyed lean more heavily on the vice president (retail), chief marketing officer or vice president of marketing for innovation-related decision-making.

Job roles with decision-making authority regarding innovative or disruptive technology

59% Chief Executive Officer

45% Vice President/Chief Information Officer of Information Technology

34% Vice President, Retail

33% Chief Marketing Officer/Vice President of Marketing

26% Chief Finance Officer



CXO's have the most influence in making disruptive-technology decisions

4. According to data from an EnsembleIQ Retail Innovation Survey 2018 (n=200, 2018)

Key retail functional areas where innovation is happening



*In 2018, retailers are focused on **loyalty, E-commerce, marketing, inventory management and merchandising** for their technology innovation.*

Challenges hampering retail innovation initiatives



*Organizations **must innovate** in order to compete and succeed in today's competitive environment.*

The data further highlights that "customer management/loyalty" and "marketing" are where the majority of innovation is occurring inside a company. More than half (56%) of respondents pointed to the customer team, and nearly half (48%) called out marketing.

In terms of challenges facing everyone looking to innovate in a company, the age-old issue of budget or lack thereof tops the list. Issues related to managing a legacy system, delivering projects within budget, and customer expectations compared to what a company can provide are other concerns. Retailers must start looking at new strategies to scale these hurdles.

2.

Strategies for Innovation

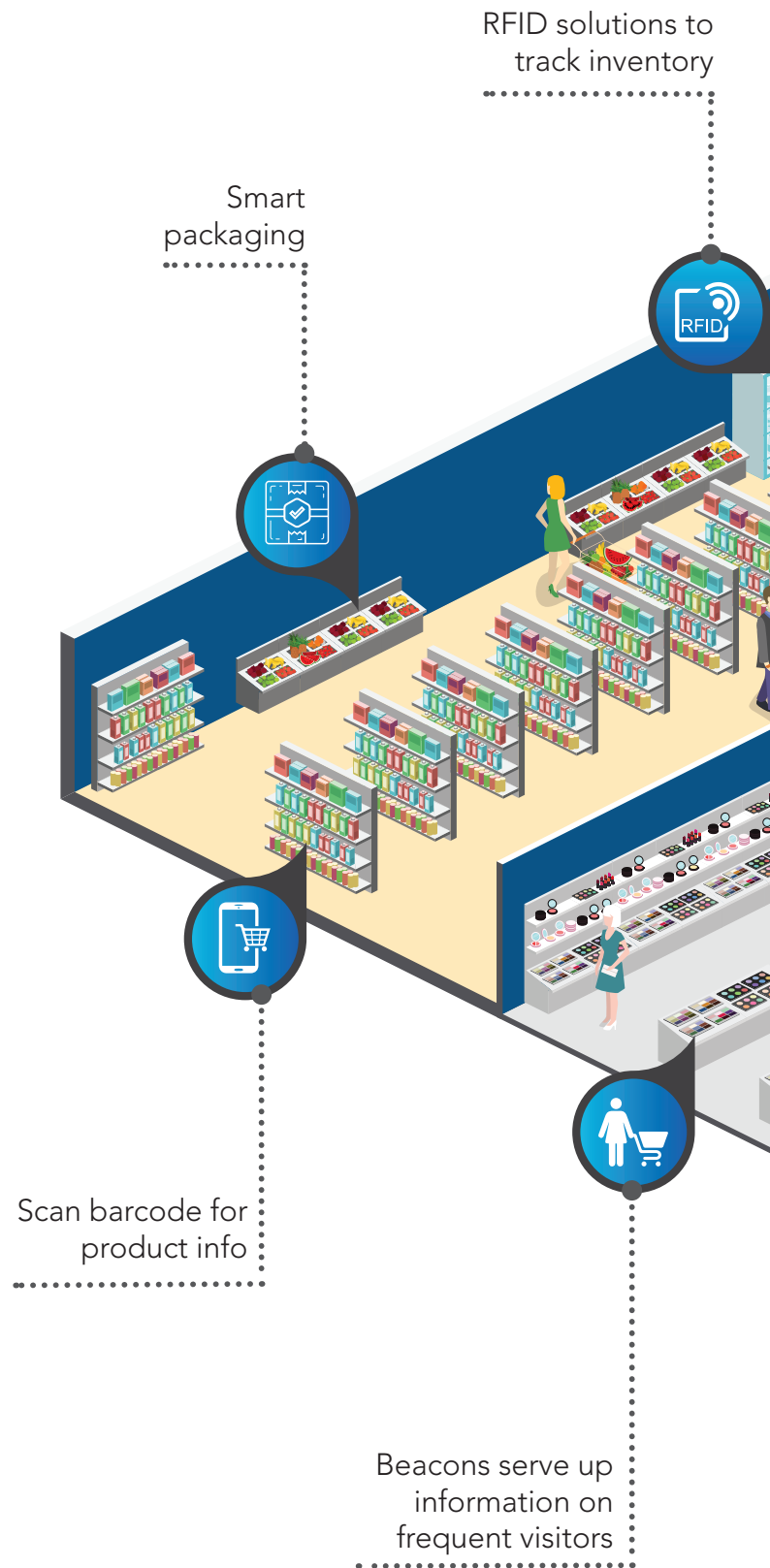
When retail companies start looking at how retail-technology innovations can improve their business, there are three main areas: business transformation, digital information management and customer experience.

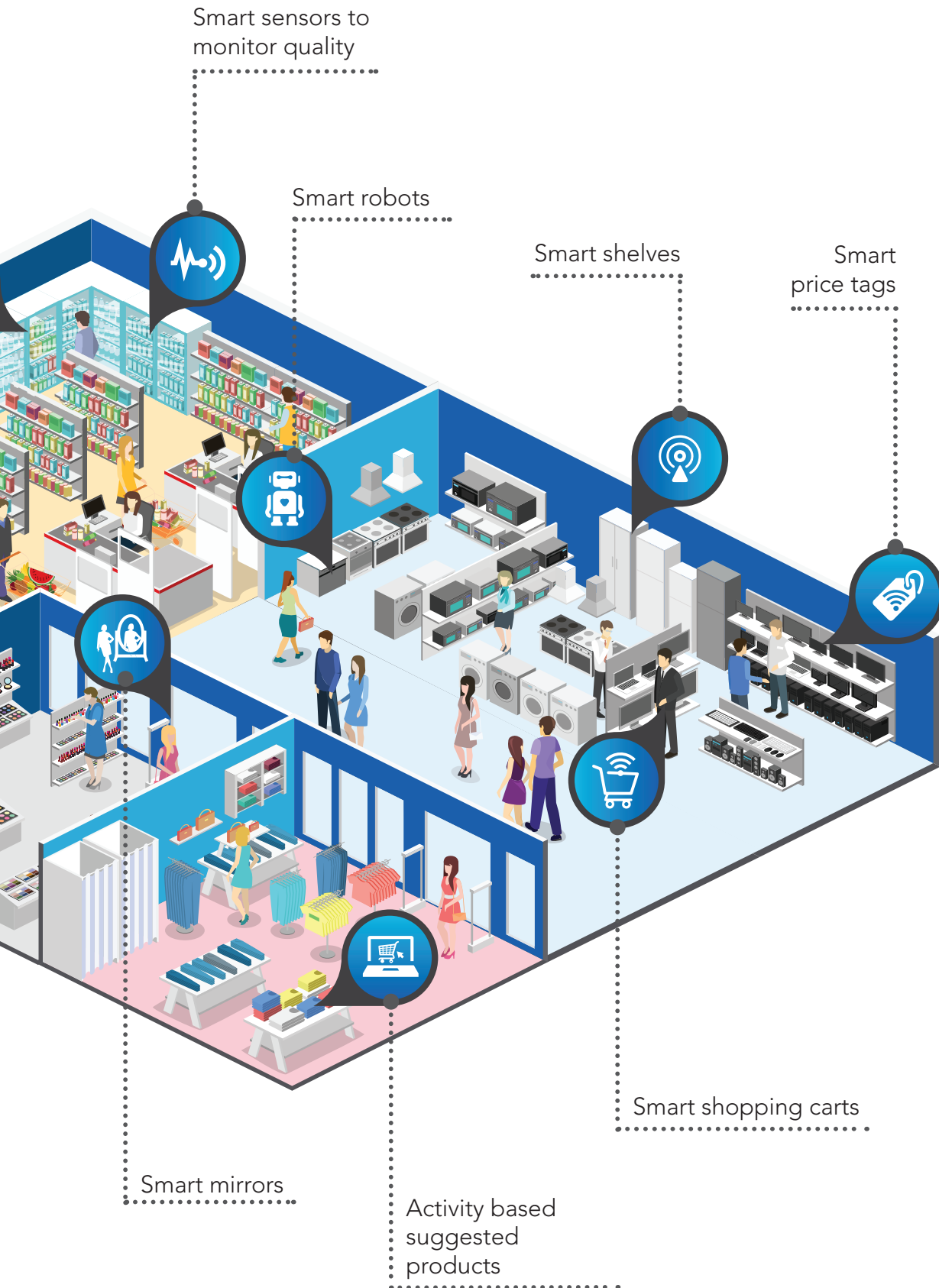
For a business transformation strategy focused on the customer, retailers should augment their current stack of technology with Digital, Interactive, Predictive, Sensory, Edge (DIPSE) technologies that are currently available. That will help sidestep customer and operational pitfalls that already exist such as forecasting accuracy, inventory out-of-stocks, high labor costs to sales, a lack of customer-friendly pricing and promotional updates, order inaccuracies, and delayed order shipments.

Looking at digital information management, retailers can upgrade by adopting new models that embrace technologies such as Artificial Intelligence (AI), Machine Learning (ML), Augmented Reality (AR), Virtual Reality (VR), Internet of Things (IoT), Big Data analytics, Cloud computing and more. These technologies are reshaping the industry and helping retailers embrace a digital and physically connected customer experience (CX).

In today's connected retail environment, what does that mean? It's all about phygitally integrated customer touchpoints based on the end-to-end experience from the minute a shopper places an order, clicks on a favorite marketplace and gets a delivery.

A continual quantum of customer-obsession and technology must support the use cases in stores. A seamless customer experience must extend across multiple channels with the right level of engagement on a customer-preferred channel. Retailers need to implement a total focus on customer-centricity and personalization throughout the customer journey. The ones that do will see higher sales, higher margins and profitability. In the end, it's the customer experience and the customer's satisfaction with that experience that will drive investment in innovation.







I. What's driving innovation investment and strategy?

Insights based on EnsembleIQ Retail Innovation Survey 2018

Traditional brick-and-mortar purchases still make up a more than comfortable margin of all the U.S. retail sales, even though online is on the rise. E-commerce accounted for 13%⁵ of all retail sales in 2017, a 16% increase compared to the year before. Amazon accounts for a little over 70% of online sales, according to the report.

But in a consumer-driving landscape, retailers and E-commerce retailers both need to keep a fresh innovation strategy to keep up with consumers. The key business drivers for innovation are around the ability to increase customer satisfaction and loyalty, develop new business growth models, and reduce operational costs.

According to EnsembleIQ analysis, besides profitable growth models such as box subscription and social commerce, retailers can also rely on private label product introductions to increase their net operating profit from an average of 3% to 9% or higher, depending on the category. And in technology, from executing hyper-targeted personalization to forging more advanced digital partnerships, there's even more that retailers are doing right now to spur growth.

Top five business drivers for innovation initiatives



54%

Enhance end customer satisfaction



43%

Create new business growth and diversification



33%

Reduce cost of operations



25%

Support dynamic store experience



21%

Future-proofing the retail business

Retailers rely on private label product introductions to increase their net operating profit by 3% to 9%.

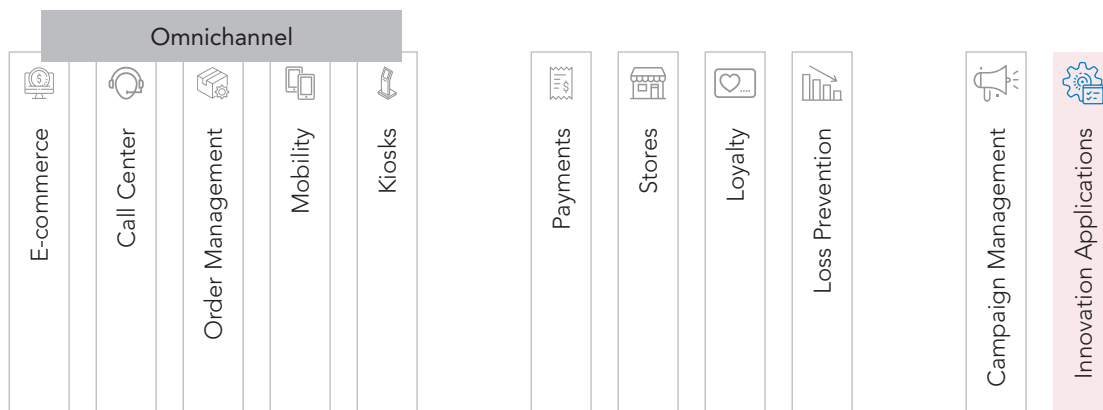
5. US retail sales for 2017 is based on the U.S. Census Bureau

II. The technological embrace happening now

Companies can take steps to secure their futures in retail by developing an innovation architecture that layers over or sits adjacent to the traditional stack of enterprise and field applications to reduce process complexity, enhance business predictability and increase user experience.

Best-in-class retailers are forging deep co-innovation and co-development partnerships with technology/business services providers. Some retailers are even acquiring such companies with unique digital consulting, cloud, artificial intelligence (AI), Internet of Things (IoT), mixed reality or predictive analytics capabilities. They are opening innovation labs, hiring cutting-edge talent and forging digital partnerships with solutions or service companies that help them automate and optimize their digital offerings. They're making investments in innovation programs with an emphasis on the buyer's journey, customer experience, pricing, inventory forecasting, personalization, predictive channel planning and other value chain areas.

Retail innovation architecture



Internally, companies are also looking at building a culture of innovation and collaboration. A culture of innovation empowers leadership teams to drive a transformation of their business models. It creates an openness to test and learn with in-store technologies that provide exclusive and unique shopping experiences. It also opens up trials of E-commerce technologies and emerging technologies such as AI and AR which leads to a stronger, overall unified customer experience.

A. Enterprise-level technologies

Cloud and predictive analytics are the most significant improvements in retail at an enterprise level at least in the last five years. Retailers are seeing scalability, forecasting, planning and user adoption gains like never before.



Enterprise-level technologies

Top technologies	Weighted score*
Cloud applications	8.0
Predictive analytics	6.8
RFID (e.g., in-store inventory and supply chain use cases)	6.7
Dynamic promotions and markdowns	6.5
Dynamic pricing	6.5
Connected supply chain commerce, visibility and collaboration tools	6.2
Innovative networking products and services (SD-WAN, 5G Wi-Fi, etc.)	5.9
Cognitive computing	5.5
Virtual omnichannel inventory management	5.3
3D space management (using 3D rendering and designs for macro and micro store space decisions)	4.0

7 out of 10
retailers use cloud
applications
to improve
the customer
experience.

*Note: We have used a weighted average methodology (current and future usage) to show leading tools/technologies.



B. Store-level technologies

Technology related to a unified, omni-commerce, in-store experience (search, personalization order, pay, delivery) often focuses on a connected experience, boosting customer loyalty and providing a best-in-class experience. It's a merging of the digital and the physical—real-time, shelf-edge pricing and promotions, self-checkout, cashierless stores, facial recognition on signage to offer personalized offers, voice-assisted shelves and more.

Tools set to effect change include NFC in mobile phones (especially with Apple's embracing it for the iPhone X) that enables customers to tap packaging and signage in a store to get ratings and reviews, videos, and even information as detailed as the journey of a crate of strawberries from farm to shelf.

Store staff will be armed more often with tablets. Beacons may continue to engage customers in the aisle, and stores will offer unified commerce platforms.

Store-related technologies

6 out of 10
retailers currently
focus on digital
payment
technologies to
enhance the
customer
experience.

Top technologies	Weighted score*
Digital payment wallet (retailer, payment provider, or third-party operated)	7.9
Mobile and tablet-enabled guided or assisted-selling tools (digital information to assist the in-store sales experience)	7.2
Real-time mobile messaging tools (store- or location-based personalized messaging to customers)	6.9
Unified commerce platform (a common store platform for integrated omnichannel commerce)	6.5
Interactive store digital signage/smart posters	6.1
Traffic counters (infra-red trail counters, high-powered image/share recognition cameras)	5.8
Near field communication (NFC) (for payments and other types of proximity data exchange)	5.4
Endless aisle (automated device or kiosk-ordering in case of store out-of-stock)	5.3
Cashierless in-store checkout (customer pick-up, bag and walk out of stores without having to worry about traditional human checkout)	5.3
In-store beacons (for real-time messaging, promotions, etc.)	5.2

*Note: We have used a weighted average methodology (current and future usage) to show leading tools/technologies.

C. E-commerce and mobile technologies

A peek at mobile and E-commerce technologies include mobile-assisted selling, chatbots that deliver a stronger one-on-one customer service experience and personalized items, auto-renewal features such as buttons seen in the world of IoT, and the use of voice assistants.

Don't forget the continued shopping advances being made in the social space with "buy" buttons in Instagram that link directly to an item to buy (gone are the three screens to click through after clicking a "buy" button). Pinterest, more of a discovery platform than a social one, continues to create innovations such as a visual search tool to zoom in and find multiple items within one photo and its shoppable pins. Earlier this year, The Home Depot teamed up with Pinterest to make more than 100,000 items available through its engaging features.

Smart appliances, voice assistant skills and IoT innovations continue to provide shoppers with new methods of shopper planning and buying. Examples include TV commercials with tags that enable consumers to scan for more information, navigation systems in cars enabling curbside pickup alerts, and connected shopping carts inside stores.



E-commerce/mobile commerce technologies

Top technologies	Weighted score*
Mobile-and tablet-enabled guided or assisted-selling tools	6.8
Chatbots for real-time customer service (online, Facebook Messenger, text or app-based)	6.2
A social commerce platform (activating buy bottoms or commerce on social channels)	6.1
User-generated content/videos	6.0
Internet of Things (IoT) (deep customer and inventory data insights derived from multiple web-connected devices and sensors)	5.8
B2B commerce (buying or selling between businesses using online or mobile catalog models)	5.4
Beacon technology (used for personalized mobile app messaging)	5.4
Endless aisle (automated device-ordering in case of store out-of-stock)	5.1
Voice-activated assistants (voice-enabled commerce or mobile apps)	5.0
Blockchain (digital ledgers for B2C, B2B or P2P commerce)	4.6

Over 40%
of retailers are
using mobile/
tablets for assisted
selling and
chatbots for
real-time
customer service.

*Note: We have used a weighted average methodology (current and future usage) to show leading tools/technologies.

D. Artificial Intelligence (AI)

With AI, machines mimic or replace intelligent human behavior, like problem-solving or learning. They “sense,” “comprehend” and “act” in accordance with the real world. AI applications include machine learning, robotics and natural language processing (NLP). While AI may have a place fueling voice-enabled commerce, virtual and personalized product search, and pricing optimization for consumers, the driving force of AI will be its convergence with the blockchain distribution network and retail data.

AI is already being used to track and manage marketing, merchandising and optimize the supply chain. Retailers using AI include Target (predicting pregnancy), Walmart (anticipating customer needs and where/what products should be stocked), Lowes (store robots for customer assistance), North Face (robot sales associates), Alibaba (making Big Data accessible for smaller retailers), Amazon (personalization and predicting supply and demand), and Netflix (giving curated and personalized entertainment at all times).

Companies or associates must not fear AI-related enhancements in retail. AI can assist in balancing tasks, delivering advanced analytics to deliver acute customer experiences, delivering the right level of customer engagement and the right experience across multiple channels at the right time.

Use cases of Artificial Intelligence (AI)

Retailers are developing AI applications for inventory planning, merchandise management, customer insights and customer service

Use case areas	Weighted score*
Inventory planning	6.8
Customer/consumer insights	6.5
Merchandise management	6.4
Online/digital customer orders	6.2
Replenishment	6.0
Store customer service	6.0
Marketing optimization	5.9
Pricing optimization	5.8
Demand forecasting	5.6
DC operations and order fulfillment (pick-pack-ship)	5.4

*Note: We have used a weighted average methodology (current and future usage) to show leading tools/technologies.

3.

2018 Retail Technology Innovation Index



The **2018 Retail Technology Innovation Index**, powered by EnsembleIQ, presents an opportunity for retailers to understand the changing retail technology landscape. It is a benchmarking platform for suppliers of technological solutions in the retail industry.

The index represents the industry's first algorithm-based, 12-factor, 0-to-100-point index of the most innovative technology companies that are advancing retailers' businesses toward the most modern and inventive retail processes. The index represents the best-of-breed and start-up retail technology solution providers, service providers, and integrators.

The index is based on a 0 to 100 point scale and is indicative of how solution providers are addressing business transformation, digital information management and personalized customer experiences.

EnsembleIQ's research team constructed the index by applying a proprietary, four-part methodology that factored in a comprehensive survey of 200 retailers, input from analysts, a secondary market scan, and demos and feedback from solution providers.

The index is divided into four broad categories:



Product: Do the products focus on the customer, and are they shopper-centric? It is a gauge of overall product leadership (offline and digital)?



Performance: Do the companies show a solution that is agile and grow ROI and leadership?



Partner Ecosystem: How does the technology drive change, and in a partner ecosystem, and does that read the market and support leadership?



Organization: What's the team, the vision and the culture of innovation with these companies? Does it have humility, diversity, innovative talent, and an ability to fail fast and start again?

Parameters

The four categories are based on how well a technology company delivers within the following 12 parameters spread out over the four categories:

- 1. Overall Product Leadership.** Executing a forward-looking product strategy and roadmap to success with a focus on innovative solutions such as deep learning, data science, disruptive design and AI. Integrating or overlaying innovative solutions into the current stack to solve specific business solutions.
- 2. Retail Market Focus.** Committing fully to the retail process and value chain, including assistance with retail sub-segments to innovate faster.
- 3. Customer or Shopper Centricity.** Delivering 360-degree customer insights that lead to a dedicated customer experience.
- 4. Agile Development.** Deploying solutions that use cross-functional teams who evolve processes on a continual basis.
- 5. Innovative Technology Solutions Growth.** Successfully performing or growing innovative solution functionality, use cases and integration frameworks.
- 6. Cost and ROI.** Assisting retailers in attaining a time-bound COO and ROI focus within two to five years.
- 7. Partner Ecosystem.** Developing a robust capability-rich partner ecosystem that focuses on innovation use cases and the integration of new solutions.
- 8. Reading the Market, Driving Leadership and Change.** Exhibiting an ability to read the market and drive market change, addressing disruptions and driving change for the betterment of its retail partners and their customers.
- 9. Team and Vision.** Seeing a market vision for the future and demonstrating a mix of top-level team members and technical resources to support it.
- 10. Diverse and Innovative Talent.** Possessing a highly diverse, multi-faceted and multi-skilled workforce that drives innovation and technology upgrades.
- 11. Culture of Innovation.** Senior leadership that models a culture of innovation, humility and meritocracy from the top down.
- 12. Fast Failure.** Exhibiting a culture that supports trial and error, growing innovation through pilots, incubation, prototypes and more.

Our methodology of selecting companies is meticulous and one that involves a detailed criteria that our community of 800,000 plus retail executives consider as being imperative for their businesses.

I. Product

Three parameters make up the Product category.

- **Overall Product Leadership (Offline and Digital):** Forward-looking product strategy and roadmap development with a focus on innovation solutions (e.g., deep learning, data science, disruptive design, AI and others), integration or an overlay of innovation solutions in the current stack to solve specific business issues.
- **Retail Market Focus:** Overall commitment to the retail process and value chain, including assisting retail sub-segments to innovate faster.
- **Customer or Shopper Centricity:** 360-degree customer insights and customer experience.

Innovation Index (group of 30 retail technology companies—by Product)

	82		74		71
	80		74		70
	79		74		70
	79		73		70
	77		73		70
	76		72		70
	76		72		69
	75		72		69
	75		72		69
	75		71		69

II. Performance

Three parameters make up the Performance category:

- **Agile Development:** Deploying solutions using cross-functional teams who evolve processes on a continual basis.
- **Innovative Technology Solutions Growth:** Performance or growth of innovative solution functionality, use cases and integration frameworks.
- **Cost and ROI:** Assist retailers in attaining a time-bound COO and ROI focus (2, 3 and 5 years).

Innovation Index (group of 30 retail technology companies—by Performance)

	83		74		69
	80		71		69
	78		71		69
	77		71		69
	77		71		68
	77		70		68
	76		70		67
	75		70		67
	74		70		67
	74		70		67

III. Partner Ecosystem

Two parameters make up the Partner Ecosystem category.

- **Partner Ecosystem:** Create strong, robust and capability-rich partner ecosystems focused on innovation use cases and integration of new solutions.
- **Reading the Market, Driving Leadership and Change:** Specific ways that retail technology companies are driving market change, addressing disruptions, and helping drive change for the betterment of retail companies and customers at large.

Innovation Index (group of 30 retail technology companies—by Partner Ecosystem)

	89		76		73
	87		76		73
	86		76		73
	85		75		72
	85		75		72
	81		75		71
	80		75		70
	78		75		70
	77		74		69
	77		74		69

IV. Organization

Four parameters make up the Organization category.

- **Team and Vision:** Composition mix of top-level teams, technical resources and future market vision.
- **Diverse and Innovative Talent:** Possessing a highly diverse, multi-faceted and multi-skilled workforce that drives market innovation and technology upgradation.
- **Culture of Innovation:** Ways that senior leadership drives a culture of innovation, humility and meritocracy top-down.
- **Fast Failure:** Creating an innovation culture through qualified and documented trial and error (pilots, incubation, prototypes and more).

Innovation Index (group of 30 retail technology companies—by Organization)

 amazon web services	83	 IBM	72	 Adobe®	65
	80	 SAP	71	 current powered by GE	65
 AT&T	77	 SYMPHONY RETAIL	71	 blippar	65
 Google	77	 facebook.	69	 Infosys	65
 intel	75	 IOI DATA MORE POWER TO YOU	69	 InContext SOLUTIONS	65
 salesforce	75	 hp	68	 sas	65
 Microsoft	74	 avanade	68	 Honeywell	64
 accenture	73	 Cognizant	67	 FUJITSU	64
 infor	72	 DIGIMARC 	66	 NEC	63
 CISCO	72	 EPSON	66	 aptos	63

V. Innovation Index (group of 75 retail tech. innovators)

 71.1	 60.0	 55.6
 70.8	 59.5	 55.5
 70.6	 58.8	 55.5
 70.5	 58.2	 55.2
 68.9	 58.1	 54.9
 66.4	 57.5	 54.8
 66.0	 57.1	 54.8
 65.9	 56.4	 54.1
 65.2	 56.3	 54.0
 63.0	 56.2	 53.8
 62.6	 56.1	 53.5
 61.7	 56.0	 53.5
 61.5	 55.8	 53.2
 61.4	 55.6	 52.9

*Note: Scoring in four product categories: Product, Performance, Partner Ecosystem, Organization

 52.7	 50.6	 49.7
 52.5	 50.6	 49.7
 52.5	 50.5	 49.5
 52.1	 50.5	 48.8
 52.1	 50.4	 48.7
 51.9	 50.2	 48.0
 51.8	 50.2	 47.7
 51.6	 50.0	 47.3
 51.6	 49.9	 45.8
 51.5	 49.8	
 51.4		
 51.2		
 51.1		
 50.9		





Index scores are not a ranking. They represent a relative indicator (or metric) that moves based on the solution provider's focus on innovation. Every company has qualified to be included on the basis of detailed parameters and innovation criteria.









4.

Strengths Classification











Group of 30 solution/service providers

Company	Product	Performance	Ecosystem	Organization
	Sensory/computing capabilities	Multi-device and system performance processing	Growing ecosystem and specific focus on retail incubators and channel partners	Global knowledge transfer and fast transition
	Intelligent solutions/AI and ML	Industry leading AI/ML use case growth along with cloud deployment	Global partner ecosystem for all industries including retail	Diverse talent for new and innovative solutions
	Digital transformation	Focus on scalable and integrated cloud-based platforms	Innovation accelerators for all industries and global partner ecosystem for retail	Global rapid product development culture
	Precision/AI-driven marketing/personalized analytics	Data/insights democratization, Marketing-to-one on the cloud	Inclusive platform(all size companies) (not dedicated for retail)	Global and high rate of fast failure culture

Company	Product	Performance	Ecosystem	Organization
	Interoperable and multifaceted devices	Consumer/user driven products	Universal/global applicability, no specific focus on retail industry	Global product development, renovation and updates
	360-degree customer engagement and omni-commerce	Integrated customer data enablement and engagement via cloud	Global partner ecosystem with specific focus on retail channel partners	Global customer-centric growth model
	Digital device interoperability and in-store customer engagement	Scalable device environment	Small to mid-sized global partner ecosystem with specific focus on retail	Global new product development
	Personalized Person-to-Person(P2P) communication, collaboration and commerce	Personalized, AI and ML ad-driven social platform	No specific focus on channel partners for retail industry	Global constant quest towards commercialization of platform
	Process driven, customizable enterprise data integration capabilities	Integrated platform for retail operations and customer engagement	Dedicated innovation accelerators and partner ecosystem for retail industry	Global retail horizontal roadmap and process segmentation
	Retail operations and omni-commerce platform	Retail architecture orientation	Global partner ecosystem, specific partners for retail industry	Global functional and horizontal retail business focus
	Retail enterprise operations, product lifecycle, customer experience management solutions	Scalable cloud-based solution for mid-market	Global partner ecosystem, specific partners for retail industry	Innovation culture, design thinking and data insights
	Cloud computing infrastructure for unified commerce, data analytics and customer engagement	Secure and scalable storage of enterprise data	Marketing and digital commerce partner ecosystem, specific partners for retail industry	Agile implementation and fast failure culture

Company	Product	Performance	Ecosystem	Organization
	Outsourced consulting services - precision marketing, supply chain, M&A, operations	High performance business strategy	Global partner ecosystem, specific partners for retail industry	Business line services and solutions organization
	IoT, sensory, network services, mobility and advanced data analytics	Device data integration and analytics management	Global alliance channel program	Innovation culture focused on vertically integrated content and distribution assets
	Unified communications, IoT, network services, sensory related infrastructure and analytics	Extend network products into new innovation areas such as IoT, sensory and customer experience	Global alliance channel program with focus on retail industry among other industries	Innovation with vertically integrated strategy, trials and pilot program culture
	AI, ML-based retail operations, precision marketing and 360-degree customer insights platform	Hyper focused on adding AI, ML layers to existing solution stack for Grocery and hardliners	Growing retail partner ecosystem	Technology innovation with fast failure culture
	Outsourced consulting services, systems integration, omni-commerce, IoT, AI, ML	Hyper focused on digital opportunities, IoT and analytics	Global partners including retail industry	Meritocracy driven, fast failure and innovation culture
	Integrated mobility, IoT for enterprise operations, customer experience, barcode, printing, mobile computing, RFID	Enterprise asset intelligence	Global partner ecosystem with focus on retail	Sense enterprise assets of their customers and derive asset intelligence
	Digital innovation within B2B marketing and customer experience	Scalability via digital document management and marketing cloud	Global partner ecosystem	Retail innovations in Adobe experience cloud

Company	Product	Performance	Ecosystem	Organization
	Store experience, enterprise consulting, and analytics	Hardware and software centric retail experience solutions	Global partner ecosystem (enterprise and best-of-breed)	Vertical centric strategy for retail experience solutions
	Mixed reality for creating immersive retail experiences (new store display concept etc)	Visualize new in-store concept and test then with real shoppers	Moderately emerging partner ecosystem	Verticalized immersive Virtual Reality, in terms of B2B prospective - retailers and brands
	Advanced retail analytics for shopper insights, merchandising, marketing and other retail areas	Cloud-based Big Data platform with hyper focus on UI, machine learning and in-database analytics	Growing partners ecosystem (data insights, OEM, value reseller and technology partners)	Verticalized strategy (retail, finserv, travel), Big Data analytics and insights culture
	RFID-based customer experience and operations platform	Integrated in-store and supply chain RFID use cases	Global partner ecosystem (includes RFID, Barcode, IoT hardware and solution providers)	Extensive patent and innovation-led culture to help customers improve efficiencies and provide unique experiences
	Enterprise consulting and outsourced solution focused on digital, customer engagement and analytics	Agile development and consumerization of IT services	Global partner ecosystem of software network of partners, niche developers and IT infrastructure providers	Verticalized IT outsourced services with focus on new digital, analytics, cloud capabilities
	Innovative BI and predictive analytics, machine learning software and services for customer journey management	Enterprise class analytics across all value chain areas, including new areas such as IoT	Global partner ecosystem for retail	Hyper focused retail analytics and expansion in new retail innovation areas
	Workforce management solutions	Mobile and cloud-enabled retail specific solutions	Services, software, technology and hiring solution partner ecosystem covering all major industries	Build an organization focused on industry first and nextgen workforce solution

Company	Product	Performance	Ecosystem	Organization
	Connected retail solutions including RFID, scanning, wearable, mobile computing and logistics solutions	Product design centered around hardware and connected applications	Global partner ecosystem focus on alliance, mobility, ISV and reseller	Evolution from legacy hardware towards digital and sensory solutions
	Sensory, loss prevention and embedded solutions	Hardware, software and sensory analytics based solutions	Growing partner ecosystem (includes research labs, universities, technology associations and other providers)	Global retail intelligence and data-driven capabilities for niche segment
	Image recognition and augmented reality platform	Integrated AR,VR and AI-based immersive tech. more accessible to B2B and B2C customers	Growing agency and reseller partner ecosystem	Startup and fast failure growth and evolutionary strategy
	Outsourced IT services, consulting, analytics, services and some software stack	Delivers digital transformation, customer delight, enterprise data and core retail enterprise IT modernization solutions/services	Mature partner ecosystem covering cloud, digital, consulting services, architecture, point applications and others	Strategy built around design thinking, agility and simplicity
	Vertical IoT platform for brick-and-mortar shopper analytics	IoT and in-store customer insights that leverage omni-channel shopper engagement	Strategic alliances with enterprise solution providers and integration partners	Retail in-store analytics innovation



5.

Conclusion and Recommendations

A consumer-led transformation of the retail sector is underway. And with this report—**2018 Retail Technology Innovation Index**—EnsembleIQ aims to assist retail companies facing the overwhelming pace of consumer-driven change and help them assess the technology innovations needed to tackle this sweeping change.

Innovation is clearly in lockstep with a retail company's ability to achieve top-line and bottom-line results. Retailers need to look at what consumers want in a retail experience—both online and offline—and look internally at organizational processes to adjust strategies and find ways to invest in innovative technology to meet consumers on the level they're requesting today.

After taking in the index and the contents of this report, consider in conclusion five key areas when executing a truly connected physical and digital customer experience:

1. Usability.

Don't underestimate the importance of designing a store, web and mobile user interface based on scientific design principles and enhancing it based on continuous testing, implementing changes from user feedback, insights from the web, and analytics.

2. Taxonomy.

E-commerce provides retailers with a real opportunity to be customer-centric in their store merchandising approach. The trick is to know the customer well and offer the most relevant set of categories across which all their content is tagged and managed.

3. Performance and Availability.

Scale remains key for retailers and something to factor in, particularly during offline and online product launches or seasonal peaks. If this is not the focus, maintaining the high performance and availability of a website or mobile experience becomes just good appearance.

4. Search.

A strong search capability combined with a detailed taxonomy and optimized user experience can help elevate the overall user experience. As one of the most used features of a retail website, performance must also be a key consideration when evaluating a search tool.




























5. Personalization.

The days of messaging to one large swath of customers are numbered. Personalization has been around for more than a decade, but few retailers have been able to integrate offline data (POS and loyalty program data) with online data, and vice versa, to truly customize and target a customer one-on-one.

The Innovation Index technology recommendations cover four crucial parts of the retail value chain: **Enterprise Customer Engagement, Intelligent and Connected Stores, Responsive Supply Chain, Customer-Centric Merchandising and Inventory Management.** These areas are currently most disrupted due to changes, including but not limited to transformation related to evolving customer channels and buying preferences, the threat of new market entrants, pricing pressures and technological advancements.



Enterprise customer engagement





































	Technology	Hype	Value	What Should You Do?
	Omnichannel customer intelligence			<i>Discerning the behavioral paths of each customer is table stakes for a personalized brand experience.</i>
	Customer data micro-segmentation			<i>Focus on identifying the most common paths across customer groups and success and failures across various customer journey paths.</i>
	Omnichannel personalization			<i>Invest based on proven use cases within targeted customization capabilities in terms of integrated customer journeys and contextual personalization.</i>
	Cloud infrastructure			<i>Evaluate overall cloud infrastructure performance and integration abilities: CRM/loyalty, channel, cloud, data services and scalability.</i>
	Deep learning data-driven attribution			<i>Cautiously invest in robotics-powered analytics, bots and personal assistant complementing solutions.</i>
	AI-based customer journey analytics			<i>Start with a few use cases to prove algorithmic, buying patterns and real-time approaches that address customer journeys.</i>
	ML-based location contextual analysis			<i>Do a proof-of-concept (POC) with unstructured data to derive insights through organized information and apply machine learning for interactive journey analytics.</i>
	Marketing IoT			<i>Cautiously invest in real-time customer engagement across various channel touchpoints, interfacing with the digital ecosystem.</i>
	Voice-activated (NLP) customer insights			<i>Try a POC across one or two major categories for automated voice-activated, virtual assistants and bots.</i>

Hype  High  Medium  Low

Value  High  Medium  Emerging  Unproven



Intelligent and connected stores

	Technology	Hype	Value	What Should You Do?
	SD-WAN			Implement managed SD-WAN. Determine the type of network needed along with costs, performance metrics, security and management requirements.
	RFID			Invest based on proven use cases focused on inventory visibility. High-end brands should evaluate customer RFID cards and tags.
	Cloud			Evaluate implementing managed cloud for all other store applications except apply hybrid cloud for POS.
	Infrared and video analytics systems			Focus on deep store insights. Graduate use of this technology by using it to measure linger time and customer behavior.
	NFC			Cautiously invest based on how you expect your customer base to adopt it.
	Drones			Cautiously invest. Evaluate a pilot within a flagship big-box store for out-of-stock alerts.
	Interactive IoT displays			Evaluate using only in your flagship stores because the value or rolling it chainwide has not been established.
	Cashierless checkout			Evaluate using one or two flagship stores as the value or rolling it out chainwide has not been established.
	Machine learning (ML)-based store planning			Conduct a customer trial to evaluate how effective it is in predicting store traffic forecasts and labor allocation.
	Voice-activated workforce or associates (NLP)			Do a POC to evaluate how effective it is in providing in-store customer assistance bots and shopper assistants.
	Robotics			Cautiously invest. Evaluate a pilot within a flagship store or DC to test in-stock or backroom management.
	Beacons			Execute a custom POC to evaluate how effective it is in providing context-specific targeted content and offers.

Hype  High  Medium  Low

Value  High  Medium  Emerging  Unproven



Responsive supply chain

	Technology	Hype	Value	What Should You Do?
	Collaborative Enterprise			Invest in collaborative Big Data and joint business planning platforms.
	Mobile messaging and document apps (includes digital wallet)			Implement mobile, voice messaging and digital documentation management for vehicle fleet and DCs.
	NFC and RFID			Use NFC and RFID smart sensors to monitor in-bound/out-bound logistics and state of products.
	Robotics			Graduate use of picking and packing automation toward AI robotics in the DC/warehouse. Monitor KPIs and scale further.
	Cloud			Update current SCM applications to a managed cloud provider for increased network efficiency, IT efficiencies and scalability.
	Interactive digital displays			Evaluate visual supply chain solutions for real-time information management in DC and on trucks.
	Internet of Things (IoT)			Cautiously invest. Do POC using DC and store inventory tracking use cases by using GPS coordinates, weather, RFID motion, video cameras and wireless data.
	SD-WAN			Conduct managed SD-WAN trials for DCs and supply chain assets by evaluating cost of network outage and mission-critical uptime needs.
	Machine learning (ML)			Invest in POC for predictive modeling of retail supply chain disruptions.
	Voice-activated workforce			Do a POC to evaluate how effective it is in providing DC assistance bots and picking assistants.
	Bluetooth beacons Bluetooth tags			Evaluate POC for data generation, inventory tracking and monitoring assets.
	Drones			Partner on POC or co-innovate on drone pickup and delivery. Monitor metrics and regulations closely.
	Mixed reality			Evaluate AR for reducing shipping errors and increase order picking speed.

Hype








































High Medium Low

Value

High Medium Emerging Unproven



Customer-centric merchandising and inventory management

Technology	Hype	Value	What Should You Do?
 Collaborative enterprise			Invest in real-time integrated B2B commerce platform for merchandising collaboration retail, brands and suppliers.
 Interactive visual merchandising displays and analysis			Implement 2D and 3D visual merchandising displays in flagship stores for increased engagement and image-recognition analysis.
 3D merchandising			Start with 3D merchandising tools for enhanced planogram management in flagship stores.
 RFID and NFC			Use NFC and RFID smart sensors to monitor state of products and inventory visibility.
 Digital information management			Invest in digitization and virtualization of all merchandising and inventory assets related data.
 Cloud			Update current merchandising applications to a managed cloud provider for increased network efficiency, IT efficiencies and scalability.
 Bluetooth beacons			Implement a POC for real-time location product benefits messaging for customers.
 Internet of Things (IoT)			Cautiously invest in an IoT POC that focuses on inventory availability using POS, mobile computer, ASN and other product/location data.
 Mixed reality			Evaluate mixed reality applications across one or two categories for store customers to view items using VR.
 Machine learning (ML)			Evaluate viability for three test pilots using ML use cases: predictive pricing, predicting supply and demand (includes assortments) and anticipating customer needs.
 Robotics			Do a test pilot to evaluate peak time in-stock process using robotics in a flagship store.
 Virtual assistance, bots and natural language processing (NLP)			Launch bots and voice-assisted assortment planning, buying, allocation and product development use cases with elastic search capabilities.
 Drones			Do a big-box, store-level POC out-of-stock alert using drone and AI technology to alert for OOS/empty shelf space.

Hype  High  Medium  Low

Value  High  Medium  Emerging  Unproven

6.

Methodology



The **2018 Retail Technology Innovation Index** is based on an empirical survey of retailers; industry analyst recommendations; a secondary research data scan of websites and industry databases; and demonstrations, conversations and insights from solution providers (including startups).

The index establishes a focus and differentiation of these companies as they relate to the needs of retailers. During the initial process, we identified more than 750 solution providers who help the U.S. retailers drive transformation.

The list of companies were then filtered through and examined against survey data of more than 200 retailers across various categories. The companies were also verified using a detailed analysis of secondary research and analyst recommendations, helping to shortlist the top companies.

The top companies were further benchmarked against the four main category pillars to weigh their ability to drive innovation in the retail industry.

When choosing a solution provider, key consideration went to vendors who possess capabilities in areas of AI, machine learning, AR/VR, cloud computing, Big Data, IoT and cloud across various functions in the retail sector.

EnsembleIQ considered several vendors that did not fit into the criteria set above. Those companies were not shortlisted due to their lack of innovative technology solutions and ability to drive retail transformation.

7.

Appendix and Bibliography

Appendix

Key terms and definitions

AI	: Artificial Intelligence
AR	: Augmented Reality
CEO	: Chief Executive Officer
CIO	: Chief Information Officer
IoT	: Internet of Things
ML	: Machine Learning
NFC	: Near-Field Communication
NLP	: Natural Language Processing
RFID	: Radio-Frequency Identification
ROI	: Return On Investment
TCO	: Total Cost of Ownership
VR	: Virtual Reality

E-tailer

Retailer selling goods via online marketplace.

Unified omni-commerce

Integrated channels/systems connected real time to provide seamless shopping experience.

Digital, Interactive, Predictive, Sensory, Edge (DIPSE)

Digital include all digital technologies across the retail value chain such as POS, in-store kiosk, customer loyalty, etc.; Interactive technologies include AR/VR, digital signage, interactive hangers, etc.; Predictive technologies include big data analytics, predictive analytics, etc.; Sensory technologies include Beacons, NFC, Bluetooth, RFID, Wi-Fi, Zigbee, etc.; Edge technologies include AI, machine learning, IoT, etc.

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