POWER of TWO

HOW EDGE COMPUTING COMBINED WITH CLOUD LEADS TO FASTER INSIGHTS AND GREATER PROFITABILITY FOR RETAILERS

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Executive Summary

- Pandemic shopping changes are here to stay. It is not about online or in-store, the answer is both. But retailers must fix their margin loss issues on digital journeys where they are losing 2-8 points of margin as compared to walk-in shoppers.
- Less than 30% of retailers have optimized these digital journeys and time is running out.
- Optimization of digital journeys not only pays off immediately but increases in benefits as more of total sales go digital.
- To optimize, retailers must adopt a new technology architecture that includes both microservices and edge technology to fully adapt to this new reality.
- Winning retailers (those with 2021 sales growth 10% or higher) have already adopted microservices at a rate X% higher than below average retailers.
- Overall IT spend as a percentage of revenue is up over 40% in the last 3 years. Winning retailers, because of their increased investments, are seeing up to 50% of their IT budget available for innovative technology spend, up from only 20% a few years ago.
- While below average retailers are increasing stores at a higher rate than others, winning retailers are spending more ON their stores to optimize all of the customer journeys, spending 110% more on IT spend for BOPIS and Click and Collect.
- The next battleground for retailers will be in getting to the most accurate inventory and the application of artificial intelligence and machine learning to that data for better forecasting and in-stock availability.

Today's Retail Challenges

After nearly two years of disruption, Covid-19 has changed how we shop forever. It has altered not only what we buy, but how we buy it.

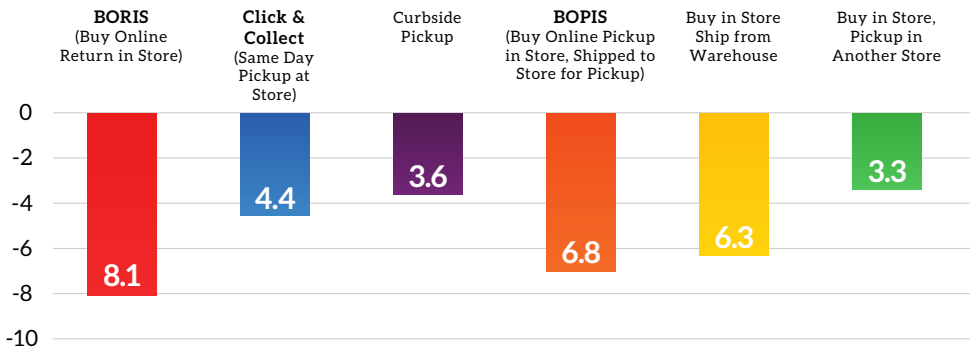
The is a second big change is massive shortage of labor: close to 4 million workers began working in warehouse and delivery positions in companies such as UberEATS, DoorDash, Amazon and Postmates. This created a massive labor shortage for front-end retail positions.

Whether it is Buy Online Pickup in Store (BOPIS), delivery or ship from a warehouse, when compared to a traditional in-store purchase, each of these journeys incurs a significant margin loss due to the additional costs of fulfillment. This might be due to costs of packing, shipping, or some other area but, on average, retailers lose 3 – 8 points of margin when a consumer leverages one of these digital journeys to complete a purchase.

Further, going into 2022, less than 30% of retailers say they have invested enough in systems and process to optimize these journeys. Specifically, in IHL's latest research, while 37% say they have optimized Ship from Warehouse, only 16% have optimized BOPIS, 26% Ship from Store and 27% Local Delivery. Early on in the cycle, IHL estimated at that time that only 45% of these new journeys would stick for the future due to the poor experiences with pickup/delivery times and out-of-stocks. What we have found since that while consumers rushed back to stores once initial lockdowns ended, over 79% of the budgets for online shopping has been retained and retail has fundamentally changed. So, it has not been a matter of shopping either online or in-store – the answer for today's empowered consumers is that they want both.

AVERAGE MARGIN POINT LOSS FROM TRADITIONAL STORE VISIT WHEN NOT OPTIMIZED

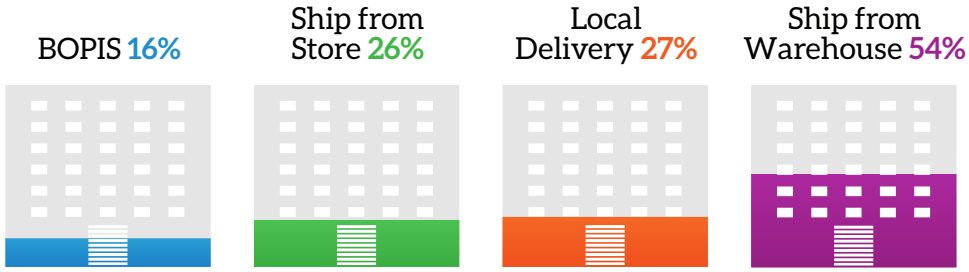
Source: IHL Group



DIGITAL JOURNEYS NOT OPTIMIZED TODAY

Percent of Retailers Who Have Optimized Digital Journeys For Profitability Today

Source: IHL Group / RIS News



The return-to-store sales growth for the past year has hidden all of these challenges. In normal retail times, sales growth creates an increase in profitability. For instance, if sales growth goes up 10%, profitability generally grows up 12-15% as fixed costs are already covered and only variable costs remain, thus more of the sale drops to the bottom line. But check the financials of even the fastest growing retailers since the pandemic and you will find that while sales have increased 10%, profitability is only up 6-7% due to the margin loss and shrink in areas beyond tradition system reporting. Extrapolate this issue to a $5.5 Trillion economy and the new retail is showing total margin losses due to shrink, inefficient processes and old technology to the tune of $165b.

Retailers face a major reckoning once that sales growth slows. It is absolutely crucial for companies to attack these issues with heavy investments in technologies along with process improvements and increased security.

Power of Optimization

It is hard to overstate the importance and power that comes from optimizing systems. How much better financially do retailers perform when journeys are optimized? Let's look at the most recent data. For those retailers that had their BOPIS processes and systems optimized by the end of 2021, they experienced profitability at growth rates 43% higher than those that were not optimized. Further, for 2022, their expectations for profitability are 72% higher than those without BOPIS optimized. And for Local Delivery, those optimized already saw 19% higher profitability in 2021 and expect 31% higher profitability in 2022.

It is important also to note that even the most efficient of today's retailers have not cracked the full equation of getting the digital journeys as profitable as traditional walk-in customers. The average margin recapture is 80% of the losses previously through optimization alone. The addition of a fee (if consumers will accept) can take the equation positive. The most critical component, however, is that as retail sales growth drops from double digits to single digits in 2022, optimized retailers will remain profitable. Without optimization many retailers will be facing losses when the in-store growth abates.

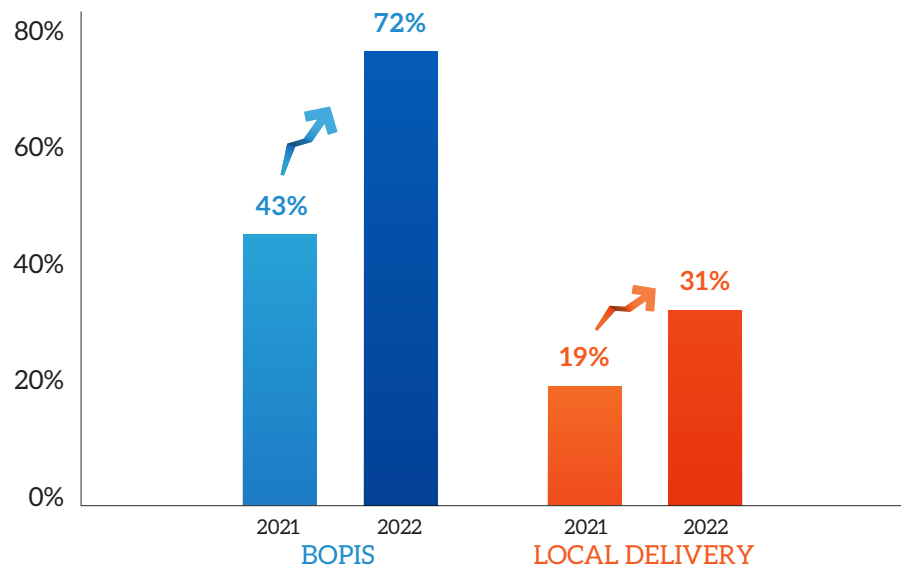
Another factor to keep in mind is that optimization is not just limited to systems. It also includes optimizing the processes and the scarce labor resources as well. A good rule of thumb that winning retailers are taking is "automate what can be automated" and leverage their labor where it adds the most value and greatest margin increase. This not only brings profitability today but positions the retailers competitively for the future.

Critical to the success of any retailer is improved visibility into supply chains. This means not only visibility into the location of trucks, but visibility from the store shelf to the supplier for both product availability and traceability. It will often include new technologies like blockchain deployment which increases data processing and storage requirements. Furthermore, the benefits should not be just one way, retailers should share critical data to suppliers so they can better meet their needs.

OPTIMIZATION PAYS FOR YEARS TO COME

Higher Profitability Expected in 2021 & 2022 for Retailers Who Optimized Digital Journeys in 2021

Source: IHL Group/RIS News



Architecture Built for Future Agility

The rapid expansion of IoT and the need for much greater processing requirements is leading to new architecture requirements for stores, warehouses, and fulfillment centers. This most often means the deployment of edge computing.

Like many terms that emerge in retail, there are many different definitions for edge computing. For a single definition we use the following: the edge is an architecture that includes the optimal place of processing of data which is outside of the data center and does not rely exclusively on cloud computing but relies on system consolidation to balance management, cost, and store experience. It includes processing optimization, network optimization, security optimization, and operations optimization.

When we talk of edge computing it is easy to think only about data created in the store and accessed at home office, creating streams of data out of the store. But equally important is managing the data streams and analytics that come back into the store in real time. So, when we talk about edge computing, it is about the processing on one side as well as the insight and access from fast and relevant data coming back.

MICROSERVICES & EDGE COMPUTING SEPARATING WINNING RETAILERS FROM OTHERS

Source: IHL Group/RIS News

Microservices **224%** More Likely to Use

Edge Computing **64%** More Likely to Use

Within edge computing there are several subcomponents that are specific to where processing is best optimized.

DEVICE LEVEL EDGE Where the processing is best completed in the IoT device itself. This is necessary because the amount of data generated (most often from imaging) would overwhelm the WiFi networks. Examples here include robots checking inventory, CCTV cameras checking shelf-compliance or frictionless retail operation that check consumer baskets.

SHELF LEVEL EDGE/ACCESS POINT EDGE Where tools related to shelf inventory with weighted shelves, perpetual RFID monitoring, price management for ESLs or other digital signs that are interacting with consumers in real-time might be used. The processing needs are heavy due to the times per second points are monitored, so each period processing at the edge sorts through what has changed since the last read and passes along to the network only what has changed.

BACK OF STORE EDGE Where we see the power of server consolidation, virtualization, video analytics and containerization come into play. This is by far the most common use of the term edge. Put simply, rather than a server spinning up a complete copy of the operating system for each application, containerization allows for the sharing of core operating system functions across applications allowing for many servers to be consolidated into a single box. This level of edge computing is specifically around processing the data before it is passed up the WAN connection and for internal interoperation of apps within the store.

UPSTREAM EDGE While we would generally refer to cloud computing as centralized computing outside of the physical location, the emergence of 5g has opened the opportunity to greatly speed the processing and servicing of applications that would previously be centrally hosted or back of the store hosted but can now include neighborhood/city/regional processing edge with similar performance. This allows for mission critical applications to be housed closer to the store but with consolidated management and reduced processing.

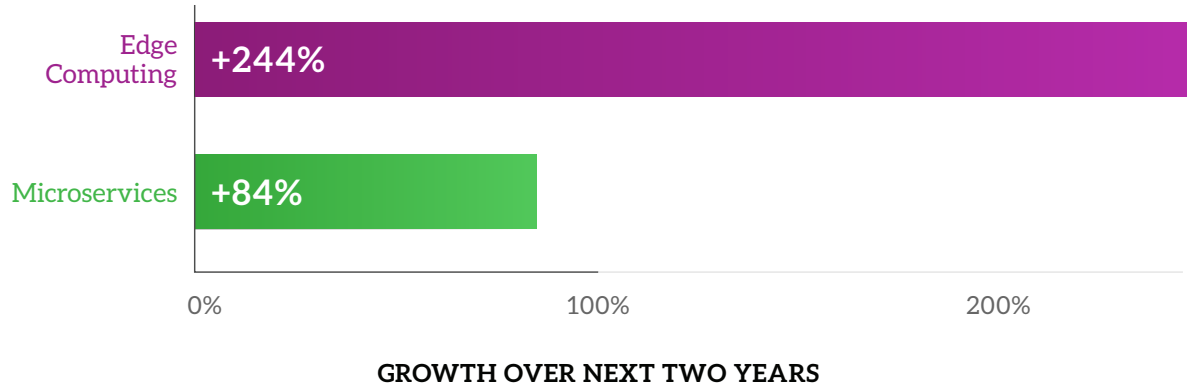
Another catalyst and partner to edge is the use of microservices design for applications. The simplest way to explain microservices is the ability to share bits of data or code from one application inside another application on demand, without the full applications needing to be up and running. It is the sharing of information on demand as needed without having to change applications. This technology is a huge help in our new multi-channel shopping world where transaction visibility, customer information and inventory status are necessary to interact to provide a seamless customer experience.

These technologies are not just being adopted by large format retailers, but they are quickly being adopted by Convenience Stores and Restaurants as they deploy new customer journeys. The C-store adoption coincides with rapidly rising fuel prices along with pump overhauls to support EMV mandates. When fuel prices rise, fewer consumers come into the stores to purchase other items that have much higher margins for the retailers. The new architecture allows for highly personalized ads at the pump via screens. Another use enabled is the use of video analysis ranging from license plate identification for payment and loyalty as well as tracking in the stores. Prior to the use of edge architecture and microservices, this simply would not be possible at the store level as the number of servers required would overwhelm the small format environment.

JUST GETTING STARTED

Edge & Microservices Growth Over Next Two Years

Source: IHL Group/RIS News



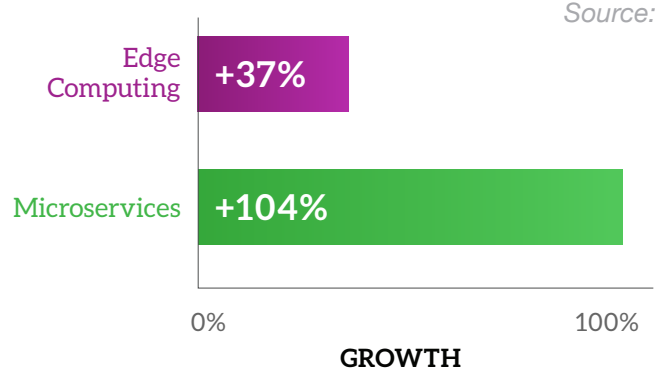
There is no denying that the real power of deployment of edge and microservices is efficiency of operations and there is a direct correlation to optimizing the digital journeys with store fulfillment. In fact, although companies who have already deployed edge computing saw sales growth of about half of the those not using edge in 2021, their profitability growth was 37% higher. So, less volume growth, more profit growth. The difference is even greater for microservices. In this case, retailers using microservices saw slightly higher sales increase (+2.6% higher), but 104% higher profitability growth than their competitors not using Microservices. Clearly powerful support for both technologies to improve operational efficiencies.

CHART Finally, one more technology driving change is the use of micro fulfillment centers (often automated) that are now part of large supermarkets and supercenters. This technology allows for 10-20% of floor space to be dedicated to a floor-to-ceiling automated warehouse with dedicated inventory for the online orders that are fulfilled by the store. One of the greatest sources of margin loss today is due to increased labor of picking items and competing with walk-in shoppers for the same inventory. This leads to massive out-of-stocks and substitutions that add cost. With these automated centers, the inventory is locked in and known so the order accuracy is much higher and the costs much lower than traditional processes.

EDGE & MICROSERVICES LEAD TO MORE PROFITABILITY

Profit Growth for Those Already Using Edge & Microservices

Source: IHL Group/RIS News



2022 PROFIT EXPECTATIONS WITH SECOND LOCATION

Separate Inventory Location for Online Orders

Source: IHL Group/RIS News

Growth in Profitability When Dedicated Second Location is Used

Winning Retailers are Spending Differently

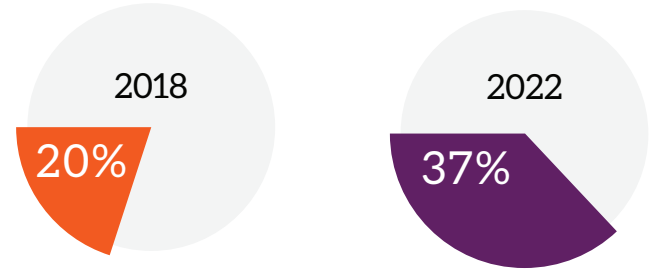
The COVID-19 pandemic ushered in a once in a generation increase in the percentage of revenue that retailers spend on IT. Where retailers had already been increasing IT spend over the past decade, from 2019 to 2022 that percentage of revenue jumped a full percentage point as retailers were forced to introduce and expand their ecommerce offerings. On average, we have seen the IT Spend as a factor of revenue increase 40-50% depending on the sector.

With that being said, there is a major difference in how different classes of retailers are spending their IT budget and the level in which they are investing. Just a few years ago, retailers estimated that about 80% of their spend was just to keep the lights on with existing systems and about 20% was available for new systems and innovation. In our latest research, the percentage for innovation doubles to 40% for GMS and Hospitality companies. Overall retailers report that only 63% of their budget is spent just maintaining and integrating existing systems and 37% is being spent on new systems and innovation. For winning retailers (retailers with sales growth of 10% or more), only 53% is being spend on existing systems for 2022 and 47% is available for innovation. This means that not only are winning retailers spending more on IT, but they are also spending considerably more on innovative IT spend and transforming their operations.

Nowhere is this difference more apparent than the comparison of winning retailers compared to below average retailers (flat or declining sales). Winning retailers are investing to make all of their digital journeys profitable where below average retailers are opening new stores at a rate 2x that of winning retailers, thus diluting their IT spend per store. In other words, below average retailers are spending considerably more of their IT spend on basic infrastructure spend for new stores, while winning retailers continue to build a firmer foundation from which to expand and growth their business.

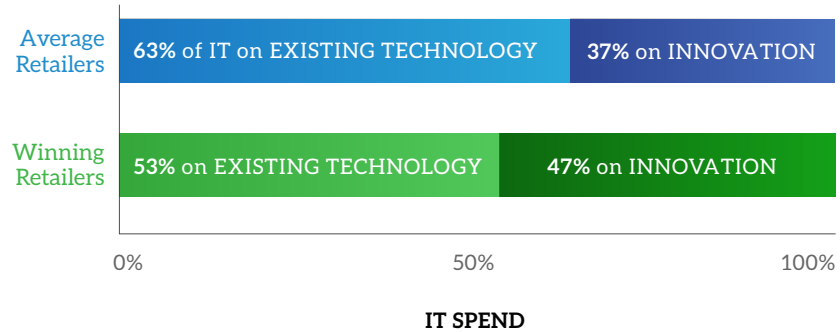
RETAILERS SPENDING MUCH MORE OF IT SPEND FOR INNOVATION

Source: IHL Group/RIS News



WINNING RETAILERS SPENDING SIGNIFICANTLY LESS ON MAINTAINING EXISTING SYSTEMS

Source: IHL Group/RIS News



Winning retailers are heavily investing in all technologies that are reducing labor, reducing costs, and optimizing digital journeys for profitability. In fact, they are growing their spend in BOPIS/Click and Collect-specific spend at a rate 110% higher than below average retailers. And when it comes to Local Delivery, the winners are growing IT spend at a level 58% higher than the below average performers in their sector. They are leveraging analytics to find both the visible and hidden areas of loss and attack those areas with process and technology updates. They are focused on using data insights to optimize, reduce non sales activity, increase efficiency, uncover upsell and cross sell opportunities, maximizing the labor force and relying on alerts to be notified in a timely fashion when something is wrong or out of the ordinary.

Overall retailers are increasing spend 244% higher in edge computing over the next two years and Microservices 84% in the next two years. Where the separation is most significant is how much further ahead that winning retailers are in these technologies than others. Winning retailers are 64% more likely than average retailers to be already using edge computing and 3x as likely to already be using Microservices Architecture in the next two years. Both of these technologies are allowing for winning retailers to be far more agile than their competitors and to react to changing consumer shopping preferences.

So, the bottom line is that winning retailers not only spending more on IT, because of years of additional spend, they are light years ahead of their competitors on adding innovation to further extend their lead. They realize the labor shortage is not going away and the digital journeys are here to stay. They are investing at levels to completely transform their businesses for the decade ahead.

WINNERS SPEND MUCH MORE ON OPTIMIZATION THAN BELOW AVERAGE RETAILERS

Source: IHL Group/RIS News

BOPIS **110%** Higher Spend

Local Delivery **58%** Higher Spend

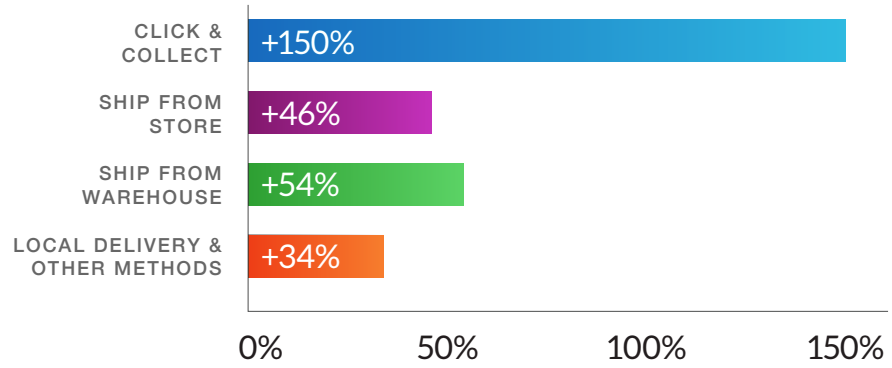
The Winners of the Next Decade

At IHL we firmly believe that edge computing is critical to retail's future success in this decade. For the past 7-8 years the retailers that have succeeded were early to embrace ecommerce and the need for a single version of the truth on their data regarding inventory (across the chain) and customers (regardless of channel shopped). This then moved to providing associates better tools for saving the sale or inventory visibility through mobile or POS access across the change. The leading retailers such as Walmart, Target, Kroger, Macy's, Levi's, Lululemon, Tesco, Adidas, Marks & Spencer, and others are now leading the charge in using computer vision and RFID technologies to get to accurate inventory counts in real-time at the store level to support all of the new customer journeys. Most retailers are off 15-25% on their inventory counts and spending significant amount of money on extra inventory or simply losing sales. As well, retailers are losing 3-8 margin points vs walk in customers on these journeys if those systems and processes are not opt-in. Having accurate inventory counts to support Click and Collect, Local Delivery, BOPIS and traditional walk-in customers is crucial. But this is just one area where IoT and edge computing can add value.

The goal is to maximize efficiency with performance at scale with faster insights with accelerated, scalable solutions with security in mind. It's the ability to leverage computer vision, video-based AI combined with Machine Learning to continue to improve store operations and all the different customer journeys that each retailer must support. What is clear from the data is that consumers use multiple channels and those include a mixture of store and fulfillment center. Retailers must deploy the technologies required to optimize these journeys and eliminate the margin drain regardless of the journey.

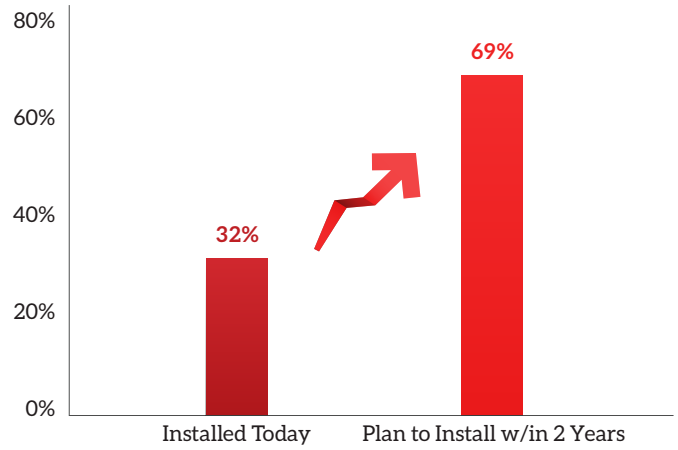
WITH EDGE: PERCENTAGE OF REVENUE COMING FROM NEW CUSTOMER JOURNEYS

Source: IHL Group/RIS News



VIDEO ANALYTICS NEARING MAINSTREAM

Source: IHL Group/RIS News



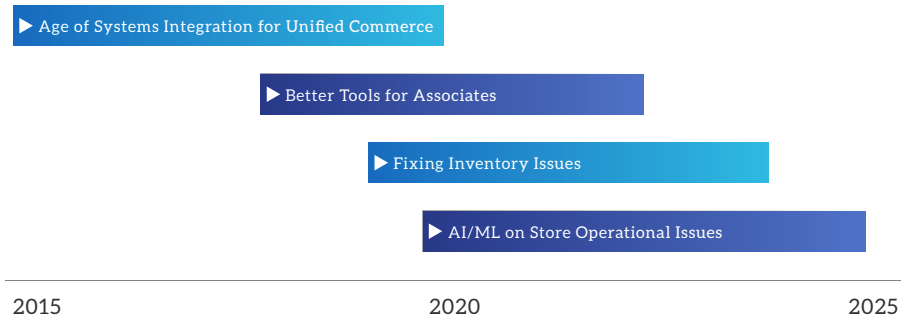
Retailers that not only survive and thrive in the next decade will be those that are able to apply Artificial Intelligence (AI) and Machine Learning (ML) to operational data at the store level. Yes, ecommerce is key part of retail's growth, but the key advantage that retailers have over pure-play ecommerce competitors are the stores and proximity to the customer. Optimal inventory, optimal processes and optimal delivery are key to this success, and all will require edge computing to be successful.

Next is hyper personalization of the offers across channels. We have seen over the years that retailers that are able to specifically target consumers through multiple channels with offers specific to their purchase history see lifetime customer values as much as 10x those of retailers. Along with inventory accuracy, this personalization of the relationship between retailer and consumer is a huge opportunity to separate from the pack.

Each of these areas require the processing of massive amounts of data that can only be done by computing on the edge. So retail is not only on the edge, but it's future is on the edge. Those companies that recognize and leverage this first will win the decade. First one to clean data for customer and inventory to apply AI/ML wins.

THE NEXT BATTLEGROUND IN RETAIL

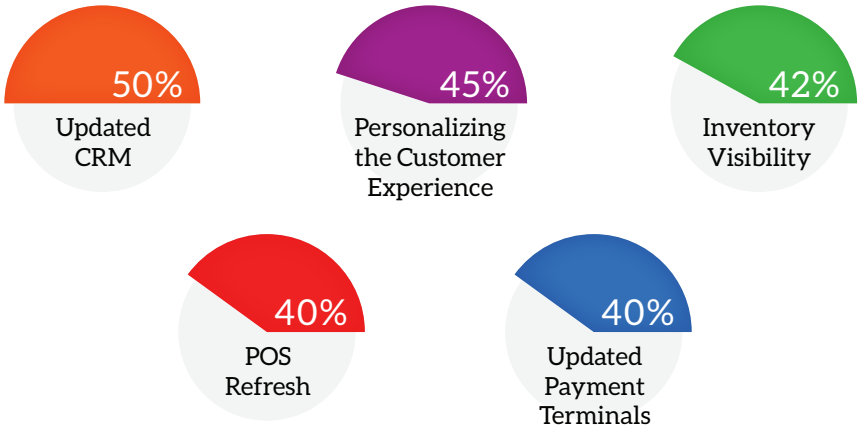
Source: IHL Group/RIS News



TOP 2021 TECH PRIORITIES

Updated CRM & Hyper-Personalization Lead Priorities

Source: IHL Group/RIS News



Retailers are leveraging AI, ML and other accelerated technologies to reduce shrinkage, eliminate stockout and gain visibility into customer behaviors. Lenovo, NVIDIA and Connection partner together to enable these transformational workflows so businesses can be prepared for today and tomorrow.

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