



Using Big Data To Enable The Omnichannel Retail Experience

MARKET LANDSCAPE AND TRENDS

The retail buying experience has been profoundly impacted with the advent of newer technologies such as smart phones and digital e-commerce. Traditional buying patterns and behaviors have changed significantly as illustrated by the progressive decline of customer visits to retail stores and the increase in online buying.

Retailers find themselves now competing with fast specialty retail digital stores on one side and massive online marketplaces on the other. Amazon has led the digital e-commerce market and profited from increasing online retail sales. As a result, they continue to expand into a variety of new categories, extending their reach and growing their customer base while posing a significant threat to competitors.

To add to this complexity, traditional retailers are challenged by the new demographics of the Millennial generation. Millennials are a growing population with large buying power and retailers are looking for effective ways to reach this target market. Millennials are key trendsetters and are driving a revolution with the shopping experience by harnessing the power of smart phones for digital product research and purchases. Millennials have an innate expectation that their online and in-store experiences will be highly personalized, collaborative and have continuity across different brands and products.

One way that retailers have attempted to address the growing gap in customer's expectations and experiences, is to collect data — any and all data corresponding to the customer's buying journey. However there is an explosion of data elements not just in volume but also with the variety and velocity of data. The end result is that retailers have reams of complex data from multiple channels but no clearer insights into their customer's changing buying patterns. In fact, only 8% of retailers in a recent survey said they have a holistic view of their customer base.¹

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¹ "Customers are Calling the Shots" paper from a survey of European retailers (2016) <http://www.pwc.com/retailersofthefuture>

RETAIL CHALLENGES AND REQUIREMENTS FOR BIG DATA

The key to success for retailers is to leverage all channels customer touch points to augment sales to develop a more sophisticated picture of shopper demand. Retailers need to manage the consumer's experience in store, online and from mobile applications to create a personalized and continuous shopping experience. The more channels that a consumer uses, the more they spend with the retailer and the greater the consumer's brand loyalty.

Retailers that collect and interpret omnichannel data are well positioned to be industry and market leaders. To better understand the intersection between customers, products and channels; retailers now require high performing data analytics to help them derive meaningful insights from their complex datasets. With a more holistic and informative view of their customers, retailers are then better equipped to offer personalized offerings, streamlined buying processes and develop new customer services.

Retailers recognize that a Big Data strategy is critical to their future success and the creation of roles like Chief Data Officer (CDO) indicates that retailers are now adopting a data-analytics-first strategy towards developing a holistic understanding of their customers. The difficulty lies in understanding exactly where in the buying journey and from what variety of sources should the retailer collect and analyze data.

Retailers need a detailed understanding of the customer's buying journey both online and in store. Tracking how a customer conducts online product research, selection and payment, leads to better execution across all channels. In-store beacon technologies (motion trackers) collect information on a customer's traffic patterns and provide insights into optimal layout of product displays and promotions. Data of this nature is unstructured and comes from a wealth of different sources. Traditional methods of data analysis cannot efficiently derive value from this unstructured data.

The velocity of incoming data is another challenge for retailers. Complex interactions from social media, in real-time, can help retailers understand current and future trends. There is a wealth of opportunity in the ability to capitalize on a trending topic, but the window of possibility is a very small one as trends and associated data changes daily or even hourly.

SOLUTION OVERVIEW

Retailers are now realizing that a data-first approach to understanding their business gives them a substantial competitive advantage. A holistic view of the customer across multiple channels is the winning formula with the ability to understand the buying journey, trends and derive predictive insights about the customer's path to purchase.

With data analytics, retailers can improve assortment relevancy and marketing campaign effectiveness to help grow revenue.

To implement and adopt a data driven focus to their business, retailers are turning to SAS, Hortonworks and Intel to help them extract valuable nuggets about their customers' buying patterns and behaviors.

SAS offers a wide variety of retail solutions that span the areas of marketing, merchandising, supply chain, sales and store operations. These solutions are built on SAS® omnichannel analytics supported by Intel® architecture, the Hortonworks Data Platform (HDP®) and Hortonworks Data Flow (HDF™).

Intel architecture offers the following benefits:

- **Performance.** The Intel® Xeon® processor E7 family and Intel Ethernet family deliver high performance and large memory capacity, and Intel Solid State Drives (Intel® SSDs) help provide fast data storage access and retrieval for SAS advanced analytics software.
- **Scalability.** SAS analytics are designed to take advantage of the enormous scale of servers, storage, and networking systems built on Intel architecture and supported by Apache™ Hadoop® architecture found in the Hortonworks Data Platform. SAS scales with a cluster of Hadoop* nodes designed to store and process big data using the Intel Xeon processor E5 family.

Intel, SAS and Hortonworks enterprise solutions help organizations capitalize on new opportunities through real-time analytics for faster insights and smarter decision making.

SAS omnichannel analytics throughout the retailer, connects every customer touch point to the retailer's brand, enabling a 360-degree view of each customer to create more profitable omnichannel customer experiences. SAS captures localized customer demand across multiple channels, powering precise and profitable marketing, assortment, inventory and store-level decisions. SAS provides a one-stop analytics shop that helps retailers make better decisions, increase productivity and profitability in every area of the retail organization (see Figure 1).



Figure 1: SAS Omnichannel Analytics Powers Retail ...at every step of the customer journey

The velocity and volume of data continues to increase and the Intel architecture is purpose-built to address very large data sets with low processing speeds. Intel provides powerful servers with on-board, blazingly fast memory and high-speed solid state drive storage connected over high performance networks that accelerate data analysis.

Hortonworks provides HDP, the only 100% open-source data management platform for Apache Hadoop which stores all types of data for analytic discovery. There are no proprietary add-ons or extensions and it provides centralized data management with easier access to data. Apache Hadoop can store huge volumes of structured and unstructured sensor and location data.

Hortonworks Data Flow (HDF) captures data-in-motion, with integrated collection from dynamic, disparate and distributed sources of differing formats, schemas, protocols, speeds and sizes such as machines, geo location devices, click streams, files, social feeds, log files and videos. Once analyzed, the resulting intelligence allows retailers to build a 360-degree view of their customers, analyze brand sentiment, localize and personalize promotions, optimize websites and redesign store layouts.

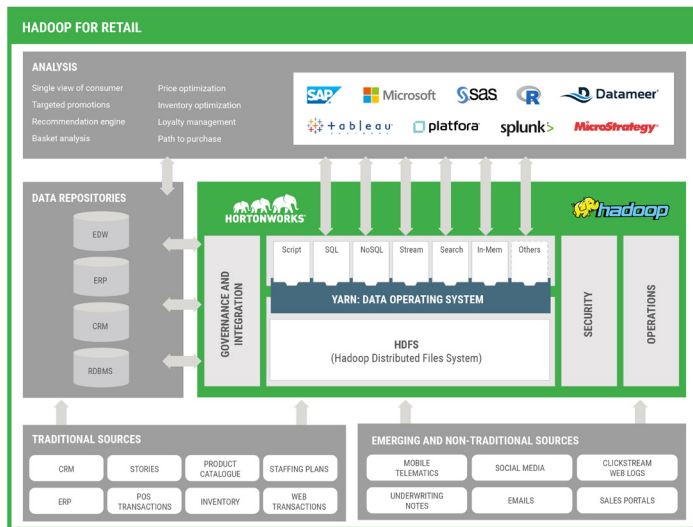


Figure 2: Hadoop for Retail

SOLUTION BENEFITS AND ADVANTAGES

Historically, different retail departments have operated in silos with very little departmental interaction and coordination. With a data-driven approach and data analytics implemented at every step of the retail process, retailers can orchestrate and execute activities based on data insights and based on customer relevancy.

Once there is a deeper understanding of what the customer is buying and why, there are opportunities for improvement in the areas of marketing, merchandising, sales, operations, and supply chain.

Marketing

Retailers spend millions of dollars every year on marketing to help promote their brand and products. With SAS omnichannel analytics, retailers are now able to increase the effectiveness of marketing campaigns across all channels to yield increased sales and improve their return on marketing investments.

Another very powerful advantage to a holistic customer view is that retailers have the ability to accurately predict the performance of marketing campaigns based on analyses of top selling products and brands.

Merchandising

Managing store assets and stock must be in lock step with customer demand or retailers risk having a surplus or a lack of availability of products. With a centralized data repository, retailers can improve localized assortment planning with their stores and be better able to manage SKU granularity more effectively. In this way, retailers can plan more accurately for future seasons with attribute analysis and reduce out-of-stock events or the need for price markdowns.

Sales

One of the most impactful areas of insights from data analytics is in sales. With a centralized data repository, retailers can determine the optimal price margins across multiple channels that are aligned with the retailer's overall business goals. Other advantages include:

- Optimization of promotional prices and ad placement with demand modeling and forecasting
- Mark items down at the right time to maximize margins and inventory sell-through
- Product recommendations based on predictive analytics
- Increase customer lifetime value and loyalty

Store Operations

SAS omnichannel analytics provides a much more sophisticated view of customer demand and the expanded customer buying journey. With this information, retail operations can:

- Enable business value creation and drive efficiency in all aspects of the business
- Speed reporting cycles for more timely decision making and executive insights
- Create a culture of analytics with self-service tools
- Improve customer satisfactions and experience in-store
- Detect suspicious cyber activity and fraud
- Calculate Risk

Supply Chain

The combination of SAS analytics and HDF, with data-in-motion, provides retailers with the ability to track all retail locations where demand signals are happening and be able to geo-locate the customer's journey. Some of the benefits include:

- Better delivery of customer service with lower levels of inventory and reduced supply chain costs
- Ability to ensure that the right product is available at the exact location and time needed
- Enhanced understanding of unified demand, service levels, shipping and fulfillment costs
- Ability to optimize profit margins and increase revenue

CONCLUSION

As trends in consumer buying patterns continue to evolve, retailers need solutions that can derive deep data analytic insights to provide a more sophisticated, centralized view of their customers' preferences and buying journeys.

The joint omnichannel retail analytics solution from SAS, Intel and Hortonworks addresses how to manage the massive information created from customer data points across multiple channels. With the omnichannel retail analytics solution, every piece of data is triangulated with the customer so that retailers can become more aware about customer behavior, more responsive to customers' needs and more effective at making informed business decisions to increase the bottom line.

To Learn More About Omnichannel Retail Analytics And Hadoop, Go To:

- [HDP and SAS for Omnichannel Retail](#)
- [Hortonworks Solutions – Retail](#)
- [SAS Solutions in Retail](#)
- [Intel Solutions in Retail](#)

About Hortonworks

Hortonworks is an industry leading innovator that creates, distributes and supports enterprise-ready open and Connected Data Platforms and Modern Data Applications that deliver actionable intelligence from all data: data-in-motion and data-at-rest. Hortonworks is focused on driving innovation in open source communities such as Apache Hadoop, Apache NiFi and Apache Spark. Along with its 1,800+ partners, Hortonworks provides the expertise, training and services that allow customers to unlock transformational value for their organizations across any line of business.

About SAS

SAS Analytics powers retail with a complete, open, integrated platform to optimize every aspect of your business, from marketing, merchandising, digital commerce to logistics and distribution. Through big data analytics, SAS makes omnichannel retail possible – delivering differentiated customer experiences and a competitive advantage that's unbeatable. For more than four decades, SAS has been the leader in analytics, serving more than 83,000 sites in 149 countries and nine out of 10 companies on the Fortune Global 500. SAS.com/retail

About Intel

Intel makes possible the most amazing experiences of the future. You may know us for our processors. But we do so much more. Intel invents at the boundaries of technology to make amazing experiences possible for business and society, and for every person on Earth. intel.com/retail.

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