How Machine Data Delivers Operational Intelligence in Retail

WHITE PAPER

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Overview

The retail industry is undergoing a profound transformation. For retailers, information technology has become a key source of competitive advantage to succeed in today's markets. As part of this change, significant new developments in information technology have come about. These developments are driven by an increased focus on enabling mobile channels, embracing new payment processing technologies and using growing volumes of data to deliver a better customer experience.

The payment devices, mobile point of sale (POS) systems, mobile apps, online stores, applications, networks and databases that comprise a typical retailer's online and store IT infrastructure generate a tremendous volume of data in the form of POS logs, payment systems and mobile device logs, application logs, server logs, syslog, message queues and clickstream data. Such data, also known as machine-generated data, is a critical source of value to retailers in providing new insights to IT, operations and the business.

With increasing reliance on real-time visibility across a multitude of cross platform solutions, today's retail technology teams face a formidable challenge in managing the big data generated by disparate systems. Unfortunately, the presence of obsolete technology infrastructures often prevents retailers from taking full competitive advantage of the wealth of information present in machine data. Oftentimes, the data is simply discarded to minimize "noise."

Attribute	Traditional Approach	Big Data Approach
Data Access	Batch	Real-time
Data Type	Structured	Unstructured/Semi-Structured
Data Type	Limited	Massive Scale
Speed of Analytics	Slow	Fast/Real-time
Analysics Type	Reports/ Dashboards	Search, Correlation, Exploration

This paper addresses some of the ways in which retailers can use machine-generated data to drive transformation across core processes and deliver measurable advantages for their organization.

The Retailer Machine Data Opportunity

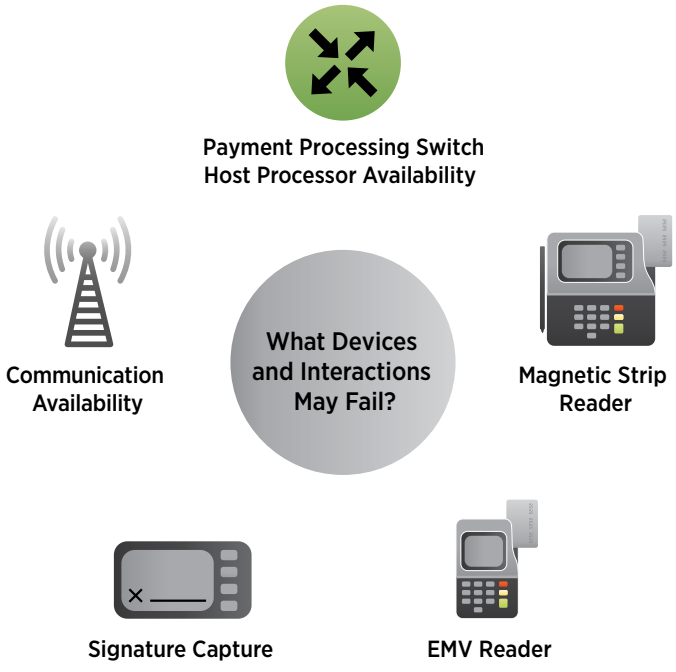
As retailers consider the impact of big data on their organization, it is useful to explore opportunities in four key areas:

- Payment processing availability
- Real-time analytics for loss prevention
- Online and mobile store performance
- Efficient order management

Payment processing availability

Payment device performance and availability is critical for any brick and mortar business. With the upcoming requirements for Europay, MasterCard and Visa (EMV) and other emerging payment technologies, the traditional support paradigm where IT has little to no visibility for all payment endpoints, payment transaction patterns and general processing effectiveness will no longer be acceptable.

Downtime on these payment devices translates into loss of ability to upsell during the payment process and inability to capture payment at a specific lane—thereby decreasing total productivity significantly. With these trends, payment device uptime and availability will be even more critical moving forward. Organizations need a scalable solution that provides real-time insights into machine data generated by the payment processing infrastructure.



Insight into machine data from payment systems can address the following needs:

- Visibility into real-time availability, performance and health of all payment devices
- Proactive real-time alerts into unavailability of individual devices, processing errors or movement of devices within the field between lanes and stores
- Real-time device failure alerts for specific events including bad magnetic stripe reader (MSR) reads, pin pad screen errors, keypad errors, device tampering, local access attempts, etc.
- Build validation for compliance reporting—since individual pin pad payment terminals all have independent firmware builds that may be unique to each retailer
- Dashboards for metrics such as failures on preloaded forms, signature capture errors, user cancellation rates by type within credit/debit cycle

Real-time analytics for loss prevention

Studies have shown that decade over decade, retailers lose about 1.7% of sales to inventory shrinkage. For years, point of sale companies and vendors in the retail technology integration business have advocated the need for expensive, purpose-built loss prevention systems. These stand-alone loss prevention (LP) systems have significant drawbacks. Firstly, in almost all cases, these systems run in batch mode and are not available to leverage analytics in real time. Most systems are fed from post audited sales data and rely on another business group to close out the proceeding period to gain LP insight.

Secondly, retailers are often bound to proprietary third party data parsing configurations. Introduction of new data elements, systems or applications require extensive re-work to ensure raw data elements are parsed correctly. This adds risk, can be disruptive to the loss prevention and operations team, and isn't immediately available to the business.

Machine data insights are well suited to enhance an existing LP solution for complete end-to-end LP functionality. With machine data, retailers can simultaneously accept real-time unedited or parsed sales data from multiple applications, eCommerce, and mobile devices to gain insight into meaningful metrics such as:

- Sales outside normal hours
- Discounts outside allowable limits
- Employees ringing their own discounts
- Extraordinary merchandise return activity
- Hand keyed credit refunds

With real-time visibility into such metrics, retailers can create a truly end-to-end view for any LP team.

Online and mobile store performance

For any retailer, the cost of online or mobile storefront downtime is huge and will only grow over time. Not only does it have a direct impact on revenues and profits, it can adversely affect the overall customer experience, leading to decreased loyalty.

While an online storefront may be very easy for a customer to navigate, the underlying applications, servers and networks are extremely complex. The IT infrastructure is often massive, distributed, virtualized and in the cloud. When a site is not performing well or is down, it is very difficult for IT and support personnel to understand the root cause of the problem because they do not have a consolidated view of machine data generated by all the discrete elements of their IT infrastructure.

When machine data such as application logs, network logs, device logs and server logs can be viewed through a single pane of glass, retail IT can break down the departmental silos and correlate across data sources. By doing so, retailers can accelerate time to resolve issues, improve site uptime and deliver a superior customer experience. Examples of insights that machine data can provide include:

- Troubleshooting and resolving online and mobile store performance or downtime issues
- Real-time insight into capacity planning metrics to support strong online transaction growth
- Operational dashboards to provide visibility into performance metrics during peak times
- Tracking customer web and mobile interaction logs to improve experience

Efficient order management

Ordering capabilities such as Amazon.com's 1-Click have made order management extremely simple for end customers. However, the underlying order management process is very complex with many steps. A retailer's IT infrastructure needs to support orders across multiple channels, devices and operating systems, all of which add multi-layered complexity to the ordering process. With such a sophisticated IT environment as the backdrop, it is often very difficult for retailers to accurately pinpoint when, where and why a customer order was not processed in a timely manner or why the order was lost.

Here are some of the benefits that a retailer can realize from deploying a robust data management approach to analyzing machine-generated data across the end-to-end order management process:

- Identifying and troubleshooting where orders are getting stuck and why
- Building real-time dashboards for operations and business teams to understand key operational metrics such as successful orders, missing orders and time to process orders
- Understanding ordering metrics in real time by type of mobile device, model, channel, browser, and operating systems (iOS, Android)
- Combining machine data with geo-location data to identify order management issues by region
- The end result is timely insight to improve the order management process and increase customer satisfaction.

Enter Splunk

Splunk Enterprise is the first enterprise-class platform that collects and indexes any machine data from a retailer's IT infrastructure—whether from physical, virtual or cloud environments. Key capabilities include:

- Collecting and indexing any machine data from any retail IT source including infrastructure, point of sale systems, payment devices and sensors
- Search, exploration and analytics capabilities to deliver real-time insights across use cases such as payment processing, loss prevention, customer experience and product insights
- Real-time alerts and monitoring to proactively address device performance issues, ensure online store uptime and improve loss prevention
- Rapidly building advanced charts, graphs and dashboards that show important trends, highs and lows, summaries of top values and frequency of occurrences
- Combining multiple views into interactive real-time dashboards for a range of users including payment processing teams, store operations, IT managers and security teams
- Enterprise-class interoperability, scale and resilience to collect and index tens of terabytes of data per day, across multi-geography, multi-datacenter retail IT infrastructures

Leading retailers across the world are using Splunk to gain operational intelligence from machine data. Splunk customers typically achieve ROI measured in weeks or months, sometimes even before Splunk software has been fully deployed into production.

Conclusion

Retailers are sitting on exponentially growing volumes of machine data—data that exists in the enterprise, can deliver tremendous value and yet is significantly underutilized. In this whitepaper, we have just scratched the surface with a small sampling of use cases where machine data insights help retailers. Other use cases include PCI Compliance, Security, Customer Intelligence, Retail Operational Sales Data and Virtual Infrastructure Management.

By applying innovative purpose-built machine data management and analytics technologies such as Splunk, retailers have the unique opportunity to take advantage of machine data to reap huge benefits—they can improve the end customer experience, increase wallet share and drive higher profits.

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