Case Study

How NCR Corporation Improved Quality and Time to Market for Advanced Analytics:

Enterprise Hadoop Implementation with Teradata and Hortonworks

As NCR says, its customers "turn the gears of the global economy." They include thousands of banks and retailers that depend upon tens of thousands of NCR self-service kiosks, point-of-sale (POS) terminals, ATMs and barcode scanners, among other equipment.

"Our customers like banks and retailers can't have downtime, so it's our job to actively support that requirement," says Brian Valeyko, NCR's director of enterprise data and business intelligence.

That downtime is increasingly rare, thanks largely to how NCR uses big data. NCR has the capacity to gather and store real-time performance data from not just a sampling of devices, but from *every one* of millions of deployed devices. NCR can store data securely in a Hortonworks Data Platform powered "data lake." From that data, NCR can create rich predictive models that prevent downtime, using analytics capabilities built on a Teradata Unified Data Architecture™ (UDA) platform.

Expanded Collection of Data and the Role of Hadoop

"We're using Hadoop as the landing zone for our machine data," says Valeyko "and as we acquire new devices into the portfolio of equipment that we support, we're going to continue to expand the amount of machine learning information that's coming off of those. I think Hadoop has a big impact on our ability to scale; the only way to effectively store that volume of data is in a commodity Hadoop environment."

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Before Hadoop, NCR could collect only snapshot data, which limited the accuracy of its predictive models. For example, the company might collect snapshots from a sampling of ATMs (perhaps once-daily performance data). With an enterprise-grade data lake built on Hadoop, NCR can *monitor every* ATM it manufactured, everywhere, and build predictive models based on data from 100 percent of those ATMs.

But how to make sense of it all? NCR uses the Teradata Enterprise Data Warehouse for its day-to-day analysis and the Teradata® Aster® Discovery Platform deep analytics capabilities to move that data around effectively in the architecture. With Teradata Aster, NCR can query a truly global data set. All of NCR's ATMs, POS and self-checkout devices collect and transmit "heartbeat data" about the condition of the device, whether components are operating properly, and generally how the network is performing.

"When we marry that data in Teradata Aster with helpdesk data from service technician call logs, we can enhance the predictive capabilities of those systems," says Valeyko. "That's how we use Teradata Aster, for discovery of algorithms that we use in our predictive operational systems."

NCR can not only sample data for analytics and insight, but it can also use an entire set of data, which includes historic data and new data types, thanks to Hadoop.

Expanded Data Processing and Analysis Capabilities

"Hadoop is a way for us to efficiently and effectively store those large amounts of data, even data that we're not sure yet how we'll use," says Valeyko.

Collecting and querying a vast amount of data creates new capabilities. "Right now we're using Hadoop to store our telephony data—that's a new usage we've found," says Valeyko, "and we're using that data to analyze our use of telepresence devices worldwide. When we're doing communications between offices, we're trying to figure out the most efficient path and determine where to put telephony equipment in our network."

That's a purely operational use of data, one that NCR customers won't see. Valeyko's group fosters "organizational altruism," sharing information across multiple lines of business. "An analyst responsible for financial products might never

have looked at retail service calls," says Valeyko. "Using big data, we're able to expand the scope of a query and root cause analysis to see how a collocated printer might be shared between a point of sale device, an ATM, and a self-checkout device," with implications for retail as well as financial services. This is the benefit of being able to leverage all the data in one place, for analytics across lines of business, and sharing analytical insights across the business as well.

The data is easy to find and move: "As we find pieces of that lake that we want to analyze, we can quickly move the data using Unity Data Mover [another Teradata product] into Teradata Aster for analysis and then use that to build an algorithm, for example, and put that into another operational system."

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Accelerated Time to Market

NCR continually feeds machine data back into its processes, which enables continuous engineering and improvement.

"Before Teradata Aster, it took six months to create, test, and release an algorithm that enabled predictive replacement of a component," says Valeyko. "Now we have an effective algorithm in production in less than three weeks." As Valeyko describes it, the global scale of its dataset allows NCR to "pick off the pieces of that large stream for further analysis within Aster."

"We can quickly update the business rules in those operational systems to ensure that we have the right device, the right component, even the right technician on the right truck, to get to the customer as quickly as possible." NCR can perform enhanced scheduling of support for those devices, matching components and technicians to specific needs. Finally, leveraging all the data, NCR can identify a much higher percentage of actual faults than it had in the past, and reengineer its processes to predict those faults and preempt them.

The result, says Valeyko, is that "Our customers know that their customers have a great experience with our devices."

So, data curation and analytics have a direct, almost immediate impact upon NCR device performance and customer experience. But that all begins with the ability to collect, store and mine that data cost-effectively.

Lessons

IT can provide tremendous benefit across an organization leveraging storage and processing in the Hortonworks data platform for Apache™ Hadoop®, heavy analytics from Teradata Aster, and a Teradata Enterprise Data Warehouse. As NCR discovered, some of those benefits and uses are obvious—like predictive modeling—but others are not so obvious, like analysis of its telepresence devices and their use.

But, says Valeyko, "an organization may need to be sold on the enterprise-wide need." "It can be difficult to figure out how to fund a discovery platform because it supports the entire organization," says Valeyko. NCR funded its initial investment in its discovery platform with sponsorship from its financial and services organizations, but now enjoys support enterprise wide. At first NCR's data scientists were the most enthusiastic, but as the business users began to see the utility of the Teradata UDA—for example, in process reengineering, freight optimization and saving money on telephony—they became interested as well. NCR formed a Data Governance Council with executive-level representatives from across its lines of business, including engineering and operations.

Customers, too, expect the deep discovery capabilities that UDA enables through the integration of the enterprise data warehouse with Hadoop. "What it comes down to is being able to look at your customers individually and collectively so that you can effectively give them the best service that you can," says Valeyko. "It's table stakes for large customers, large manufacturers, any large business."

"We're operationalizing the information we're finding. The discovery platform is really a service that IT provides which enables the business to perform."

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