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THE POWER TO KNOW®

Harnessing Customer Insights Using Big Data

Insights from a breakout session at the
SAS Premier Business Leadership Series (PBLS)

Table of Contents

Introduction

How do organizations know what they know about customers? Do they know all they should, and do they know what to do with it? The answers to those questions are being fundamentally reshaped by the concept of big data. The hopeful vision of big data is that organizations will be able to harvest and harness every byte of relevant data to understand customers so well that they'll be able to deliver an unparalleled customer experience.

Big data technologies have arrived just in time to meet the challenges of a hyperconnected and intensifying marketing environment. Customers are more empowered and less loyal than ever. They are well-informed and digitally savvy. They interact with your brands, other brands and each other through multiple channels. They expect a superior customer experience, and they can easily click to your competitors or vent their frustrations if they don't get it.

These pressures call for greater insight to shape exceptional customer experiences. The answers are out there, hidden in the data – in terabytes and petabytes of it from internal and external sources. Marketing organizations are grappling with the exponential growth of available data – both structured and unstructured – from paid, earned and owned channels. Big data technologies can support a shift from simply collecting huge amounts of that data to being able to take advantage of its full value – right now.

What approaches are enterprises taking to better understand customers better through big data? How can organizations get support for investments in the data and analytics horsepower to make use of all this data? What obstacles are common, and how do the front-runners overcome them?

We put those questions before a panel of experts at the SAS Premier Business Leadership Series (PBLS) and got some interesting perspectives. In exchange for their candor, we promised them anonymity. Trust us, they're leaders in well-respected and progressive companies.

What Is Big Data?

To begin with, we had to ask, "How does your organization define big data?" Ask 10 people, and you'll get 10 interpretations.

"We've had a lot of data about our customers and partners for many years," said a vice president of marketing analytics for a retail finance company. "What's different now is the growth in nontraditional data sources (particularly unstructured data), the degree to which business partners and industry consortiums are willing to share data with others in the industry, and the speed at which we are expected to access and process the data to get business-changing insights."

The hopeful vision of big data is that organizations will be able to harvest and harness every byte of relevant data to understand customers so well that they'll be able to deliver an unparalleled customer experience.

"Big data is more of an evolution than a revolution," said the vice president of analytics insight and loyalty for a major investment firm. "If we were only talking about volume, I'd say we've had big data for many, many years. What's new is the expectation to be able to aggregate that data to offer truly personalized services. This is complicated by the fact that we have a very diverse set of clients, ranging from day traders to long-term investors. So our clients have a wide range of behaviors and interact with us in many different ways – through the website, through a financial consultant, via our call center or by taking a seminar. These interactions generate a vast amount of data that we need to bring together in a helpful way to support decisions. That's what I think of when I think of big data."

At SAS, we see big data as a relative term. "Whenever the data reaches the point where processing needs, structures and volumes are making companies uncomfortable, that's big data," said Jill Dyche, Vice President of Best Practices at SAS. "We look for the upper-lip twitch with executives who are saying, 'We really don't know what we're going to do with this right now.'

"If not now, when? If you're not going to manage it now – when? If you're not going to integrate it now – when? If you're not going to cleanse it now – when? I just had the chief marketing officer of an insurance company call me back, and he had two words to say: 'OK, now.' Eight months ago the firm wasn't ready, but big data is starting to make them uncomfortable. Now they're ready."

Some organizations will have to rethink their data management strategies when they face hundreds of gigabytes of data for the first time; others might be OK until they reach tens or hundreds of terabytes. But whenever an organization reaches the critical mass defined as big data for them, change is inevitable – and so is the corresponding impact on customer relationships and profitability.

How to Get Buy-In for Big Data Technologies

Developing the foundation to support big data requires an investment in systems, technologies and people – which requires money, and that requires buy-in from the people who write the checks. Easier said than done. Even IT executives don't want to hear that the existing infrastructure is lacking. "The challenge we're seeing the most is the assumption that incumbent technologies can solve this problem," said Dyche. "We'll hear IT executives say, 'The TCO [total cost of ownership] for our data warehouse is $40 million, so what do you mean we're not doing big data now?' They're handling big data volumes, but they're not actually solving a big data problem."

When it comes to making a business case for big data investments, our panelists shared what worked for them.

> At SAS, we think of big data as a relative term describing a situation where the volume, velocity and variety of data exceed an organization's ability to use that data for accurate and timely decision making. The reality is that this challenge is occurring with data sets that aren't terribly big.

Frame Your Request in Terms of Business Problems

"When you go to executives and say, 'I need x million dollars to invest in data collection and integration, and the ability to put data into a grid to process it faster' they're going to look at you and say, 'What's the value of that?'" said our investment firm panelist. "A better approach is to talk in terms of business problems. 'We're here to reduce attrition.' 'We're here to make customers more loyal.' 'We're here to get our existing customer base to invest more assets with us.' You're going to have to tie the investment to business objectives and then show the value.

"At our firm, client loyalty is a big emphasis, so tying investments to improving client loyalty is something that gets a lot of attention all the way up to the CEO. But you still need to establish an ROI component. They believe in loyalty, but they need to see how this IT investment is going to drive loyalty. 'Show me that by having all this data integrated, you can do these personalized services that will move our net promoter score – and if so, by how much it is going to move, and how much ROI that represents in terms of new accounts or new assets.' Everybody believes in it, but they want to see how and why it will improve."

Show Rapid Value with a Proof-of-Concept Project

In some company cultures, value must be quantifiable and quickly seen, said the vice president of marketing analytics for a retail finance company. "We're a very ROI-focused company, so we need to show the payback very quickly. We have achieved that with small-scale pilot programs. For example, we wanted to combine partner data with our data to drive marketing strategies that would help increase sales for both companies. Before we commit to a big database and processing power, we did it as a pilot on a few clients and demonstrated the results. As we showed the value and gained results for our retailers, more and more of them were willing to share their data with us. Now we could go to our executives and say, 'We've shown the value, but I can't keep up this manual process across 50 retailers and 300,000 dealers. I need a systematic way to be able to do this, so I need investment to scale it up. With the proof-of-concept pilot, we could quickly demonstrate the results and justify the investment."

Another panelist offered a similar example of prototyping to show early value. His firm is collecting unstructured data from recorded call center conversations and using that information to help understand customer value, customer satisfaction, the root causes of impending attrition and more. The firm did a prototype in one geographic market to establish the value, which then made it an easier sell to expand into other markets.

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> *Vice President of Best Practices*
> *SAS*

Acknowledge that You Won't Be Able to Predict All the ROI

Some of the benefits of big data investments should be self-evident, said Lori Bieda, Executive Lead for Customer Intelligence at SAS. "Organizations that want to understand customers better and create a differentiated customer experience seem to inherently believe that customer data is important, and more customer data leads to better decisions. They might not know upfront just how it pays off; they might not be able to quantify the worth of pulling in new data sources such as social or mobile, but fundamentally they know that if they had deeper knowledge about customers, they could probably monetize it."

When organizations develop the ability to manage, analyze and really use big data, it catches on and the benefits can spread in unexpected ways, said another panelist, citing one example: "We're trying to connect all our data sources so the people in our operations center will know the value of a customer when they're interacting with that customer on the phone. As long as I believe that this is the right platform to build, my role is to build it and demonstrate some successes with it. I can't foresee every application that the call center will come up with once they have a holistic view of the customer, but I know other successes will follow."

Consider the Cloud

"With data growing at exponential rates, many organizations are looking at their existing architecture and wondering how they're going to make it scalable," said Bieda. "You can't go back and re-architect everything while you're running a business. By turning to hosted cloud solutions and working with other external partners, you can walk and chew gum – continue to embark on new big data initiatives while sustaining the everyday functions of the business."

Dyche agreed: "Let your technologies do what they were originally designed to do. One of the promises of these emerging technologies is that you can offload a lot of the standard, single-path extract-transform-load (ETL) processes that are very processing-intensive and skills-intensive. You can offload the existing data warehouse that may be consuming excessive investment, and go to the cloud for some of this processing. In the process you can optimize platforms that had been stressed under big data demands, while enjoying cost savings and economies of scale."

Does Big Data Mean Creating the Mother of All Databases?

No, our panelists agreed. "The intent isn't to go through all the work to create a whole new big database," said the panel's retail finance specialist. "There's no such practical thing, because in three years, there will be new data sources, and you would need to build something else. So we're evaluating tools that will go and actually pick out the data that we want, rather than put it all in one place."

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> *Executive Lead for Customer Intelligence SAS*

"The concept of an enterprise data warehouse – bringing data into a central source for analytics and other purposes – is valuable and should not be abandoned, but it's insufficient," said our investment firm analytics expert. "You can't put all the data into the data warehouse fast enough to support real-time decisions. For example, if you see that a visitor on your website is looking at a particular type of fund or downloading a white paper on a particular topic, you want to be able to act on that information. The trick, though, is you want to be able to connect to your data warehouse, bring in the consumer's profile that contains all previous knowledge you have about that consumer, connect it with the new information that's emerging before your eyes, and have your analytics tie these data sources together."

You can't achieve this type of responsiveness by keeping the data in a monolithic data warehouse. A viable alternative is Hadoop, an open-source software framework for running applications on a large cluster of commodity hardware. Hadoop delivers enormous processing power – the ability to handle virtually limitless concurrent tasks and jobs – making it a remarkably low-cost complement to a traditional enterprise data infrastructure.

"The barriers to discovery are much lower now with some of these emerging technologies," said Dyche. "Before the Hadoop MapReduce solutions came on the scene, and before high-performance analytics was really institutionalized, it took a lot for analysts to convince management to support low-hypothesis types of analysis. 'Hey, we need eight months to troll through all this data in our relational databases to come up with patterns that we don't know anything about, and that we may or may not do anything about.' That's a hard sell. Now we can throw together an analytical sandbox pretty quickly and do that kind of discovery work and come up with customer differentiators that we didn't know to look for."

What Does Big Data Bring to the Equation?

Big data technologies – such as grid computing, in-database analytics and in-memory analytics – can deliver answers to complex questions with very large data sets in minutes and hours, compared to days or weeks before. You can also analyze all available data (not just a subset of it) to get more accurate answers for hard-to-solve problems, uncover new growth opportunities and manage unknown risks – all while using IT resources very effectively.

Whether you need to analyze millions of SKUs to determine optimal price points, recalculate entire risk portfolios in minutes, identify well-defined segments to pursue customers that matter the most, or make targeted offers to customers in near-real time, big data technologies redefine the possibilities.

"Any data analyst will tell you customer intelligence is a combination of art and science. Sometimes when you get the data together, you don't actually know what you're looking for. Then you start to detect patterns and predict what you thought you wouldn't even see."

Lori Bieda
Executive Lead for Customer Intelligence
SAS

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Vice President of Best Practices
SAS

"From a marketing perspective, it's about optimizing the customer interaction by knowing what's the next best offer, the next best communication to provide to that consumer, at the time that consumer is in the market for one of our products and services," said a panelist. "So big data definitely has a huge impact for our marketing initiatives. But there's also a customer service element, because our customers contact us in many different ways – call center, branch office, website, etc. Customers get frustrated when they go into a branch and the person they talk to doesn't know about their recent interactions on another channel. The desire to improve both customer loyalty and marketing is driving our directions in big data."

"When marketing uses big data, there tends to be a ripple effect to other parts of the organization," said Dyche. "For example, we worked with a general merchandiser company on a project they called 'Precision Retailing.' Shoppers had GPS-enabled mobile devices, and we tracked their behavior through the store, collecting an average of 10,000 data points for each shopper encounter and streaming all this data into a Hadoop cluster. The initial goal was to look at each shopper's buying habits to optimize merchandising and shelf space, but the results went beyond the traditional marketing role to the brand people. They could see which brands needed to be end caps, for example, and where shoppers were lingering as they strolled the aisles of the store. We collected tons of data for the original purpose, but we saw it reused for other strategic purposes as well."

When planning a big data implementation for customer insight, which is more important – the ability to personalize the interaction or the ability to do it in real time? It depends.

Suppose the customer had a negative experience in the last interaction. You would want that information at hand during the next interaction, so steps could be taken to surprise and delight the customer. Conversely, if the consumer is ready to make a purchase decision right now, then real-time decision making and personalized content would make a difference.

But purchase decisions aren't always made that spontaneously; your customer intelligence only needs to be as fast as the customer's speed of decision. If you're sending location-based offers to a customer's mobile phone, you need to have real-time decisions that trigger an action at the point of contact. After all, there's no sense sending an offer pertaining to a location the customer has left. But for interactions with your website, that kind of decision speed is desirable but not crucial. Content can be tailored based on the visitor's most recent interactions.

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Big Data and Mobility

"Mobility redefines customer contact more profoundly than any other device has done," said Bieda. "Marketers have new options with mobile wallets, location-based marketing, geofencing and the ability to communicate with consumers via mobile devices. It becomes a game of connecting content to consumers when and how they want it. The retailer recognizes the pattern of my past behaviors, anticipates what I'm likely to buy, and presents me with offers when I'm in close proximity to an outlet that has that product or service. That's an example of relevant content delivered through big data – with the benefit of historical context as well as the dynamic element of real-time understanding and information delivery."

"We've made investments in mobile technology to enable customers to apply for cards and check their balances – standard capabilities that consumers expect to be able to do by smartphone," said our retail finance expert. "More recently, we've enabled customers to use their mobile devices to redeem their awards. For example, if you earned a $10 certificate on your card, instead of going online and printing it or finding it in your paper statement, we now have the ability to send it straight to your phone, so you can have it anywhere you want."

The next big step for many retail and financial organizations is location-based marketing – something that is slowly gaining ground in the US but has been widely adopted in Latin America and Europe.

Big Data, Big Governance

For all its merits, big data will intensify the need for data quality and governance, particularly related to data security, privacy and regulatory compliance. Everything that was problematic in data governance before will just be bigger now. "For some organizations, putting parameters and policies in place around big data is like getting your arms around water," said Bieda. There are several considerations to big data governance for customer intelligence:

- **What you withhold from public view.** "Data privacy in our industry is very regulated, so we take that extremely seriously," said a panelist. "We have very strong processes regarding who has access to what kind of data. Even before the regulations made that data governance imperative, our partner contracts required us to maintain strict data boundaries between clients. Data privacy is as serious a consideration in a big data implementation as building the database and the access."

- **What you deliver to public view.** As big data enables marketers to create highly granular segments and generate multiple choices and offers on the fly, there's a danger in oversaturating customers with communications, especially as customer contact strategies are fragmented out to different marketing groups. Big data calls for more flexible and dynamic ways to define and enforce contact policies.

- **How much you reveal about what you know.** At what point does personalized service cross the line into being creepy? "We already hear some feedback about consumers saying they made a transaction and then logged into the website or called customer service, and when they realize you already know what they did earlier, there's a little bit of a Big Brother feel to it," said a panelist. "We have to be careful how we use all the knowledge big data gives us."

- **How you manage it.** "It's a double-edged sword," said Bieda. "You've got this barrage of rich data, you're trying to monetize it, but at the same time you're having to improve the value of it and measure the results, while big data is undoing the fundamentals of everything that was true in the past about measurement. You have to look at it differently, because we're now living in a very fluid world."

- **How you report it.** "As consumers, we're used to having things pushed to us quickly on our mobile devices, whether we asked for it or not," said Dyche. "It's much the same with decision management. Measurement becomes both proactive and reactive, and increasingly executives are expecting the results to be pushed to them, as opposed to having to pull them out."

The Big Data Nirvana – Is It Realistic?

"Technology is no longer the impediment to being able to aggregate insights across multiple business functions and products," said Bieda. "The hardware and processing capacity are no longer bottlenecks to data integration or large-scale data analytics. Whether for marketing, risk or fraud, there's a universal way of looking at customer contacts and information across an enterprise.

"Down the road, big data leads to the opportunity for enterprise decision engines, the ability to look at a customer based on everything we know about them – service interactions, probabilities for cross-sell and up-sell, risk, fraud and all the rest – and be able to make holistic decisions on behalf of the organization rather than a specific function. Much of the groundwork for this vision is being laid, and the financial services sector is leading that charge."

"This concept exists in pockets already, in a slower batch form," said a panelist representing the finance industry. "In our world, we do take additional views of the customer or partner into account, beyond the marketing view – if not the whole view. With information sharing, we know how many touch points our partner has made with a customer. We know how many purchases a customer has made at a store, not just on our card but with other types of tender. The evolution of this cross-entity insight will be the speed with which we can execute and the ability to automate some of this. Ideally, we'd want to take insights from this holistic view and then establish rules so an action can happen automatically without intervention, without us having to run campaigns and incur the cycle time associated with running an outbound tactic."

"The analytics to support this and the decision engine are going to evolve," said our investment firm panelist. "The train is going at 60 mph, and you're doing this on the fly. That's what you've got to be thinking about."

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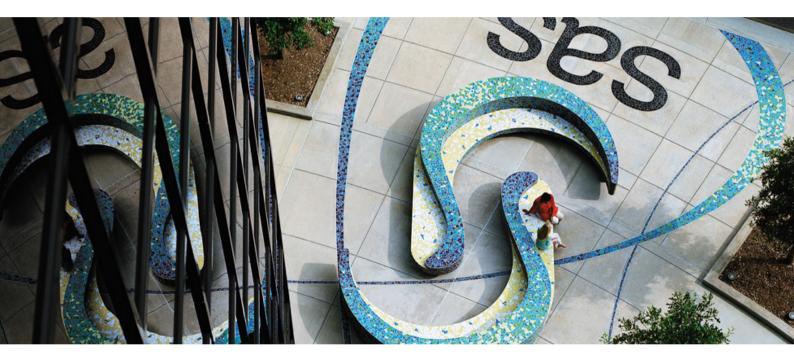> *Executive Lead for Customer Intelligence SAS*

For More Information

For more thought leadership views about big data and customer intelligence, read the *Harvard Business Review* report: Customer Intelligence Tames the Big Data Challenge

To read more thought leader views on marketing, visit the SAS® Customer Intelligence Knowledge Exchange: sas.com/knowledge-exchange/customer-intelligence

To get fresh perspectives on customer analytics from marketing practitioners writing on the SAS Customer Analytics blog: blogs.sas.com/content/customeranalytics

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