

# BANKING ON CUSTOMER BEHAVIOR

How customer data analytics are helping banks grow revenue, improve products, and reduce risk

In the face of changing economies and regulatory pressures, retail banks are looking for ways to replace lost revenue through greater product penetration, relationship profitability, and customer loyalty.

Data analytics deliver actionable, timely—and even predictive—intelligence about customer behavior that improves products, grows sales, and reduces risk.

Banks can reap benefits by starting with a well-defined use case designed to deliver immediate business value—and then build on success.

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## THE PROMISE OF CUSTOMER DATA

Few industries have access to such rich sources of customer data as banking. The data that banks already have about their customers can reveal—and even predict—a great deal about individual and group behaviors. What's more, this intelligence can be presented in a timely and usable form to marketing, product development, customer service, and other teams to help them make better decisions—faster—to improve customer experience, reduce risk, and grow profit.

Analyzing very large amounts of customer data in realtime and automatically sending alerts when a pattern change indicates fraud has long proven effective at reducing the risk of loss.

The promise of using customer data to grow top-line revenue is equally compelling. Real-time visibility and analysis of customer behavior over time can increase sales, maximize customer profitability, and improve retention by providing actionable intelligence to reach the right customer, at the right time, through the right channel, with the right offer.

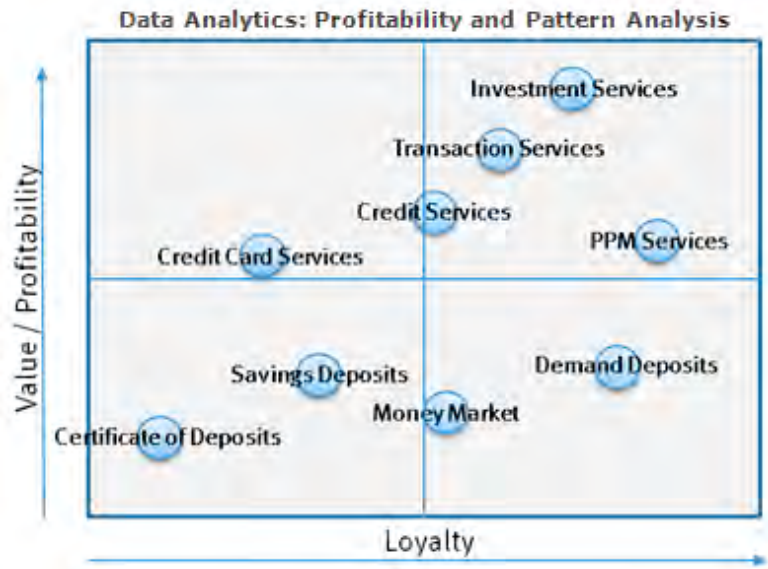
More specifically, as banks are demonstrating, customer data can be used to:

- Provide greater insight into a customer needs and wants—and how they evolve over time
- Predict the likelihood of customer attrition and trigger proactive intervention at a specified threshold
- Segment and target customers in new ways—e.g., value-to-institution, channel preferences, social media use
- Provide up-to-the-minute tracking and trend analysis of product usage and channel preferences
- Identify negative-space opportunities for cross-selling and up-selling
- Assess the potential for profit, as well as risk, before offering a product or service to a customer
- Maximize profitability by identifying which customers should be migrated to which more appropriate products, channels, and relationships
- Identify high-value customers and personalize offers, services, and rewards that match their preferences

## CAPITALIZING ON DATA

Over the years, marketing, product management, channel operations, digital sales, customer service, IT, and other bank stakeholders have made considerable investments in data infrastructure and projects to leverage customer data. Nevertheless, many banks continue to struggle to achieve operational visibility into the full customer relationship—including bank account and credit card activities, loan and mortgage obligations, and investment products and services. Many marketing and product development teams continue to be limited to generic research, such as market size and opportunity analyses, demographic segmentations, and internally and externally conducted surveys, as the sole inspiration and basis for their campaigns, concepts, and offer development.

## RELATIONSHIP DEVELOPMENT & PROFITABILITY



*To maximize profitability, relationship management, and product bundling strategies, banks need to take customer institutional value into account. The strategy for high-deposit, low-fee customers, for example, should be to move them to investment and transaction services that generate more fees. Over-extended customers should be managed to preserve their generated revenue through personal financial management and cash flow/bill payment management.*

### MORE FROM THE DATA YOU ALREADY HAVE

In contrast, consider the potential unique insights that could be gained through timely analysis of a bank's existing customer checking account and credit card data. A complete picture of customer financial behavior emerges—spanning where money comes from and how it is spent. Which customers keep a high balance in their checking account? Which pay off their entire credit card balance every month? Which checking accounts fall to near-zero between paycheck deposits? Which customers consistently pay only the minimum on their credit card balance?

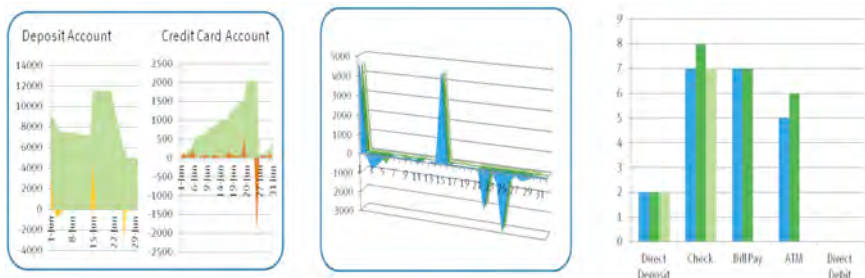
Add the ability to track and compare patterns of customer behavior over time, and it's possible to glean intelligence that could be applied in multiple ways to increase revenue and improve profitability. Data could be used to identify and target certain types of savers or spenders with specific campaigns; to sell services to customers in changing situations; to migrate individual customers to more appropriate products, channels, or relationships; and to proactively reduce risk—in short, to make better business decisions.

For example, while a couple might easily qualify for a mortgage based on a multiplier of their incomes, the loan officer that is also presented with a history of minimum payments on maxed-out credit cards will make a more informed decision. Real-time tracking and analysis of checking and credit card data could also help a bank avoid being blindsided by mortgage delinquency.

Rather than only becoming aware of trouble when mortgage payments stop and few remedial options remain, as is typical with mortgages, pattern-based behavior analysis could help identify risk earlier.

For example, the mortgage department could be alerted when paycheck deposits suddenly stop or if credit card spending shows a precipitous drop—indicators of job loss or some other change that could eventually impact the customer’s ability to meet their mortgage obligation.

## CUSTOMER BEHAVIOR ANALYSIS



*Customer analysis should be based on behavioral patterns, not just balances. The three graphs above use time distribution to dynamically illustrate customer financial behavior over multiple statement cycles. Customer transactions and behavioral trending and analysis can provide important clues to a strengthening or weakening relationship—as well as suggest preemptive sales and service actions to preserve the relationship.*

## MORE FROM NEW DATA SOURCES

In addition to the rich internal data sources banks already have available to them, the growth of social media and other public digital data offer new opportunities to gain profitable insight. By correlating internal banking data with the “digital self” that customers create online, banks can further increase their understanding of customer needs, wants, and situations.

For example, a bank might use social media data to target customers with offers or services aligned to recent life events (e.g., graduation, new job, marriage, birth, divorce, etc.). By applying customer sentiment analytics to social media data, banks can gain a better appreciation of what individuals and virtual communities think about a new product, and what particular aspects of the institution or services they particularly like or dislike.

A challenge for many banks is figuring out how to use the “non-structured” data on social websites (as opposed to the “structured” data in a traditional database). In addition to using social media as a source of additional customer data, banks will want to be able to test and measure how best to use social media as a channel for launching campaigns and products.



## OBSTACLES TO INTELLIGENCE

While the potential of new sources of data from sites like social networks is new, the vision of capturing, analyzing, and presenting customer data in near-realtime to inform decision-making is not. Despite decades of effort, however, the vision has proved difficult to achieve. In general, the more ambitious the data initiative, the more likely it was to have been thwarted by data growth, business complexity, and rates of change.

Common obstacles include:

- **The size and growth of data.** As data sets become ever larger— and grow more quickly—they become difficult to manage and take longer to analyze.
- **Complicated query.** Query tools requiring specially trained analysts separate users from data and add to turnaround time.
- **Static snapshots.** Technology, process, and skill limitations restrict business users to point-in-time analyses, as opposed to real-time visibility into data and trending.
- **Integration of unstructured data.** Limited experience with and tools for managing and analyzing unstructured data prevent use of valuable data sources.
- **Perishable intelligence.** The usefulness of many types of data insight fades quickly if a bank is not able to put it into action quickly enough.

## PUTTING DATA IN ONE PLACE IS NOT ENOUGH

Banks have long struggled with issues of silos and incompatibility created when data about customers, products, activities, and transactions are generated by different departments and service providers, stored in different systems, using different data descriptions and formats, and managed by different organizations.

To enable all of this data to be shared more easily across the enterprise, banks have invested in data warehouse infrastructure and initiatives that store all customer relationship data in one place to reduce data redundancy and simplify data management.

But changing data sources and the relentless, rapid growth of data volumes bring new challenges. As enterprise data warehouses grow ever larger, the goal of gaining timely actionable intelligence and visibility into customer data can seem more daunting. Some data warehouses have grown so large, for example, that a data refresh can take days. Queries also typically remain a multi-step process, with results delivered only via a specialized business analyst's report. And the extract, transform, and load (ETL) structures that departments build to automatically capture, analyze, and report on the specific data they want, can in and of themselves become complex to maintain or update, when new data sources or types of analyses are required.

## COLLABORATING TO MAKE SENSE OF BIG DATA

As the inherent “distributed” nature of data sources and the need for more immediate and user-customizable analytics of ever-larger sets of data have become apparent, a new, less monolithic approach to business intelligence has evolved.

By enabling greater, more automated collaboration among technology, people, and processes, new “big data” capabilities make it practically feasible to capture and analyze very large amounts of different types of data, very quickly. They make it easier to provide realtime visibility and to present timely, actionable intelligence to many different types of users, with different roles and responsibilities across the bank.

### TECHNOLOGY ALONE IS NOT THE ANSWER

While technological breakthroughs have made it practical and economical to capture and process large amounts of data, what is especially striking is that these new technologies are not designed to work alone. Instead, they leverage the open source model and APIs to work together to cost-effectively process very large amounts of customer data, from multiple sources, at very granular levels of detail—and yield increasingly user-customizable intelligence in near-realtime. These complementary technologies include:

- **Metadata.** These tools provide data about data. They automatically search for, find, and describe the type of data available on internal systems and external sources. They create metadata repositories that can be leveraged by analytics tools, separate from the complexity of underlying data.
- **Federated query.** Once a metadata tool has identified the types of data and where the data is located, distributed query frameworks, such as the open source Apache Hadoop software platform used by such data-intensive distributed applications as Google and Facebook, enable efficient, on-demand, integrated queries of multiple sources and types of data (structured and non-structured). Together, the combination of metadata and federated query replace static ETL structures with a dynamic ability to adapt as data sources (especially external) change or are moved.
- **Analytic engines.** New, relatively affordable, analytics-optimized massively parallel processing (MPP) relational database engines can ingest very large amounts of data very quickly and execute very the analysis of very large amounts of data very quickly—for scalable realtime data acquisition and availability.
- **Baseline patterns.** By establishing baseline denominators for comparison and rules and thresholds for identifying “out-of-band” events, baseline systems can be set up to quickly identify when a change to the expected pattern occurs. By comparing new patterns to the baseline, the systems are able to surface out-of-band information quickly—without having to process underlying data. Long applied to prevent credit card fraud, the approach is increasingly being used for other time-sensitive information, such as indication of imminent customer attrition, so that proactive intervention can be made.

## ZIONS BANK USES PREDICTIVE ANALYTICS TO DRIVE REVENUE AND MINIMIZE CHURN

Zions Bank, which operates 500+ banking offices in 10 states in the U.S., believes using customer information effectively provides a competitive advantage.

However, the bank's data warehouse was unable to handle the increasing volume, variety, and velocity of data and meet analytics demands. Working with EMC Global Services, Zions migrated its entire data warehouse infrastructure to the Greenplum Database. The massively parallel processing database captures data from multiple sources, including commercial and mortgage loans, investments, deposits, credit cards, and external demographic files. By processing data in a fraction of the time—for example, cutting enterprise-wide database loading cut from 24 hours to 30 minutes, and answering queries in seconds rather than hours—Greenplum makes it practical for the bank to do in-depth queries and predictive analysis on specific customer behavior.

The results are used to drive product development, marketing, sales, and CRM, so Zions can respond more directly to individual customer needs, often with custom products. A user-built profitability re-reporting system running on Greenplum calculates the profitability of every loan, investment, and deposit account by customer. Using it, the bank significantly increased the net profitability of individual customer accounts. A Next Best Offer product recommendation engine examines a customer's product mix and predicts new sales opportunities.

It has proved so successful that Zions is building a repeatable standard process for quickly creating and deploying a data-mining model. The Zions' Greenplum solution has scaled from 6 to 11 TB of data. Because Greenplum runs on low-cost commodity servers, Zions can add data warehouse capacity in small or large increments.

## IT TAKES A TEAM

As useful as more collaborative technology has proven to be, efficiently extracting meaningful business value from large amounts of data requires collaboration among people with a mix of skill sets as well. Critical expertise includes:

- **Banking experience.** It takes industry experience to effectively translate the needs and objectives of business users into a well-defined use case that will meet expectations—and provide the basis for ongoing expansion, refinement, and operationalization.
- **Data architecture.** Data architects design the technical architecture and build out the infrastructure to enable technologies to work together to find, ingest, and analyze data and to present results.
- **Data science.** Data scientists translate the business use case into analytics that will run on specific data architecture.
- Tools with features that help different people in different locations with different types of expertise to collaborate more effectively on data analytics projects are also essential.

## IT TAKES END-TO-END PROCESS DISCIPLINE

As the number of data sources, tools, and people multiply, maintaining end-to-end process disciplines for data governance, security, and lifecycle management becomes more important than ever. What's required are processes that standardize and manage business data at the data element level. In the past, this was very difficult to do, but today's new tools help automate and control how data is originated, where it resides, how it's used, who can use it, how it can be changed, and how it is managed.

## MOVING FORWARD

With the growth of big data, pressures to apply it, and nearly limitless possibilities, it can be difficult for banks to see the way forward.

What helps is that new data analytic technologies work on top of the data infrastructure banks already have—and work together—making practical to start small, and then build on results, while realizing incremental return on investment along the way.

## BUILD ON WHAT YOU HAVE

New technologies do not replace, but leverage existing investments in bank data infrastructure. Data warehouses, for example, become another data source for metadata tools and federated query to work with in unlocking data and making it useful.

## START SMALL

New collaborative approaches and less expensive, open source technologies make it economically feasible to define a very narrow business case or specific problem statement and build out a solution with measurable results.

A well-defined use case enables a bank to apply technology and prove out concepts to meet a business need, and then uses the findings/results and the incremental return on investment obtained to define the next step.

Banks can also get started today, by initially sourcing the external expertise they need—and making the transfer of skills and knowledge to internal teams a part of the project.

## SUMMARY

Banks are applying powerful new automated and intelligent “Big Data” solutions today to make better use of their unique customer data and provide meaningful, actionable and predictive insight to staff at all levels to increase revenues, reduce risks, and differentiate their institution in a competitive global market.

Now is the time to begin to take advantage a more collaborative, dynamic, and incremental approach to put multiple kinds of data to work to better understand, predict, and influence customer behavior.

## CONTACT US

To learn more about how EMC products, services, and solutions can help solve your business and IT challenges, [contact](#) your local representative or authorized reseller—or visit us at [www.EMC.com](http://www.EMC.com).

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