

# Big Data In Banking: It's Time To Act

by Jost Hoppermann and Martha Bennett, April 15, 2014

## KEY TAKEAWAYS

### **Words, Rather Than Deeds, Currently Dominate Big Data In Banking**

Banks recognize the potential benefits big data can bring to their organizations, both in clearly customer-facing areas like marketing and service as well as in risk management and compliance. However, up to now, the number of banks talking about the importance of big data is considerably larger than the number with real-life implementations.

### **Banks Need Big Data Insights To Stay Competitive**

Big data approaches and techniques provide banks with the depth and speed of insight needed to provide the level of customer service and product differentiation that both businesses and individual consumers expect. Whether it's real-time pricing or "market of one" approaches, banks without such capabilities will be at a competitive disadvantage.

### **Solution Profiles Help Banks Make The Business Case For Big Data**

Technology management professionals can increase their chances of success by making sure that any big data project fits into a solution profile proven to deliver value. The key profiles are customer analytics; service and product development; single view of the customer; risk management and regulatory compliance; and foundational solutions.

### **Banks Must Balance Opportunities And Challenges Carefully**

Big data solutions will become a key element of banks' application landscapes, but there are potential downsides. Creating yet another data and app silo is one of the biggest risks. You may also need to make tradeoffs between functions and cost. Another challenge: Getting the right balance between privacy considerations and technical possibilities.

# Big Data In Banking: It's Time To Act

Compete In The Age Of The Customer By Making Use Of All The Available Data

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## WHY READ THIS REPORT

Big data is a key trend for many industries, including financial services in general and banking in particular. Key business drivers in the banking industry, such as improving customer service, increasing revenue and profit, as well as supporting regulatory compliance and risk management, indicate that big data can provide value to banks. However, the current use of big data in banking isn't equal to the priority that banks accord it today. We also found that banks don't necessarily talk about "big data"; they instead seek more powerful and flexible solutions that provide better insight into their customers or their risk exposure — things they have been doing for years, if not decades. What's different now? The new data sources as well as the tools and technologies that can use all of this data to provide better customer insights. This report provides solution profiles of big data deployments in banking as well as insight into the business value that these solutions provide to banks.

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Forrester interviewed vendor and user companies, including Luxoft, Polaris Financial Technology, SAP, TCS, and several banks.

## Related Research Documents

[Banking IT In 2023 Updated](#)  
September 7, 2011

[Financial Services Of The Future: Collaborative Competition Will Be The Norm](#)  
August 20, 2008



## BANKS NEED BIG DATA INSIGHTS TO REMAIN COMPETITIVE

Financial services firms in general and banks in particular can generate critical business value by analyzing the enormous amount of information they have stored in their data centers — such as data on their customers, financial transactions, and historical market information. In the past, information technology (IT) teams tended to focus mainly on securely and effectively capturing, storing, and handling data — rather than providing insights into improving their relationships with their customers and thus also improving business performance. Today, technology management teams work on a much broader range of activities, using a broader portfolio of technologies, to provide their bank with the insight and predictions it needs to better serve its customers and boost its growth while managing risk and staying compliant with regulations.

- **Big data and analytics will become crucial to success.** In the future, real-time and advanced analytics will increasingly be a key building block for a bank's success.<sup>1</sup> However, the required analytics can't simply focus on internal data and traditional external data feeds: Social media, data collected across a variety of channels, location-based information, and even, longer term, data from sensors and streaming media will all contribute to the tool set that banks can use to be more customer-centric, competitive, and successful.
- **Banks understand the importance and benefits of better data management and analytics.** However, many are at an early stage of execution based on this understanding. One banking executive told Forrester that he believes that many banks lag behind industries like retail as far as data mining, analytics, and big data are concerned.<sup>2</sup> Some technology managers in banks explained that they use big data tools like Hadoop or In-Memory to more effectively cope with traditional challenges such as a single view of the customer or near-time risk management to better serve customer needs — without using the term big data at all. Others said that their bank had a dedicated road map in place to accelerate big data initiatives. In Forrester's Forrsights Software Survey, Q4 2013, 77% of North American and European software decision-makers from the financial services industry told Forrester that business intelligence (BI), analytics, and decision-support tools are a high or critical priority for them.

## SOLUTION PROFILES HELP IDENTIFY VALUE AND CREATE BUSINESS CASES

While banks accord data-related projects a high level of priority, the number of financial services firms currently using big data or planning to use big data is significantly lower: The same Q4 2013 survey showed that in financial services companies that are using or planning to use big data, the finance department is the best-positioned business area for big data; 55% use or plan to use it, compared with only 34% to 39% of key business areas that can drive top-line growth, such as customer service, marketing, product development, and sales.<sup>3</sup> Bank execs gave Forrester multiple reasons for this gap between the priority and the reality of use: One of the most important is that many organizations are currently in the early stages of their big data planning and development. However, the most important reason is that financial institutions require solutions that are cost-effective, easy to manage, and highly flexible and that provide high business value.

## Banks Need Big Data Insights To Facilitate Survival

To help technology management professionals build the business case for big data technologies, Forrester talked to a variety of vendor firms and banks about what business value banks have created or intend to create using big data approaches. Most banks accept the need for improved analytics and big data tools, although they don't necessarily use the term "big data" for this approach. Also, many banks don't necessarily start their big data projects with a truly large data store: Some start small or even very small, with data volumes not expected to exceed the mid-gigabyte range over the next few years. Others only use big data tooling to create business value with midsize information pools. However, their data challenge often isn't the volume of data but the diversity of formats. We identified five areas with profiles of solutions that can help technology management teams more easily build big data business cases. Big data in banking supports improvements in:

- **Advanced customer analytics.** Banks recognize that customer analytics play a vital role in winning and retaining customers.<sup>4</sup> A large domestic bank analyzed customer information and social media to improve the customer experience (see Figure 1-1). We also found examples of big data driving top-line revenue growth: A global tier one bank showed how customer analytics can generate significant revenue increases (see Figure 1-2). Banks also found value in additional areas: A US bank with more than \$100 billion in total assets uses various custom-built and off-the-shelf tools to monitor client satisfaction, demonstrating that big data technologies can help increase customer loyalty and retention.
- **Service and product development.** Customer experience and retention are not the only factors that help banks drive top- and bottom-line growth. Product and service management as well as pricing are also high on banks' agendas. In the US, Home Trust fostered its growth strategy via improved capabilities to manage its loan portfolio and define new products and services for its customers (see Figure 1-3). A large US wealth management firm increased its market share by significantly accelerating the process for providing bond pricing by using big data — and making bond prices more accurate at the same time (see Figure 1-4).
- **Single view of the customer.** Customers prefer to be treated as individuals and expect targeted communications and product and service offerings; "one size fits all" approaches are no longer acceptable. However, today's banks find this hard to achieve, as customer information is typically distributed not only across various product-specific applications and data stores but also across fragmented channel solutions. Thus, a large domestic bank with about 10 million customers recently started implementing a "big data"-type operational data store to provide a single view of its customers to all business lines across all channels — without piecemeal integration of the underlying solutions (see Figure 1-5).

- **Risk management and regulatory compliance.** Risk management and regulatory compliance focus on “traditional” topics such as credit exposure, liquidity risk, and reporting. Examples show how these topics can rapidly become extremely interesting, as they can help banks react faster to changing markets conditions. By tripling the performance of its risk reporting, Aareal Bank Group (Germany) can now offer a near-time basis for decisions on the bank’s property loan portfolio (see Figure 1-6). A global clearing and settlement services firm upgraded its regulatory reporting capabilities by introducing a real-time system to handle high-volume, complex data — and, at the same time, built the foundation for future value-added services for its clients (see Figure 1-7).<sup>5</sup>
- **Foundational solutions.** A number of banks use related big data technologies for integration — thus building the foundation for the development of future value-rich solutions. A large US bank uses technologies like Hadoop to integrate heterogeneous sources of reference data and distribute them across the bank. A global tier one bank uses various big data tools to globally integrate its heterogeneous banking solutions; the improved access to global data enables the global managers of business lines to make better decisions, faster (see Figure 1-8).

**Figure 1** Big Data Solution Profiles In Banking

**1-1 | Solution profile: advanced customer analytics**

Company	Large domestic bank with more than 6 million customers
Drivers	<ul style="list-style-type: none"> <li>• Improve the customer experience</li> <li>• Provide more responsive service and better targeted campaigns, increase profitability, and maximize cross-selling opportunities</li> </ul>
Solution	<ul style="list-style-type: none"> <li>• Advanced analytics (including predictive analytics)</li> <li>• Social media monitoring integrated into bank's systems</li> </ul>
Value	<ul style="list-style-type: none"> <li>• 360-degree view of the customer at a lower cost</li> <li>• Social media monitoring costs reduced by more than \$100,000 per annum</li> <li>• Dashboards provide decision-makers at the bank with near-real-time insight into customer sentiment and preferences</li> <li>• Transformation of the customer engagement and response process</li> <li>• Customer service productivity levels improved by 20%</li> </ul>

**1-2 | Solution profile: advanced customer analytics**

Company	Commonwealth Bank, Australia
Drivers	<ul style="list-style-type: none"> <li>• Better targeting of profitable customers</li> <li>• Real-time analysis of transaction history</li> <li>• Improved customer service</li> </ul>
Solution	<ul style="list-style-type: none"> <li>• Advanced analytics</li> <li>• SAP solution, including Hana, Business Intelligence, as well as GRC and Disclosure Management</li> </ul>
Value	<ul style="list-style-type: none"> <li>• Significant revenue uplift</li> <li>• Improved customer acquisition and retention rates due to meeting customer needs at the right time</li> <li>• Increased cross-selling based on analysis of historical customer data</li> </ul>

**1-3 | Solution profile: service and product development**

Name	Home Trust, US
Drivers	<ul style="list-style-type: none"> <li>• Improved capabilities to manage a larger loan portfolio and increased number of products to support top-line growth</li> <li>• Better customer service to reach financial goals</li> <li>• Avoidance of batch cycles in legacy solutions</li> </ul>
Solution	Implementation of SAP BW on Hana
Value	<ul style="list-style-type: none"> <li>• Support of growth strategy and improved customer service</li> <li>• Near-instant views of a customer's profile, including history and risk data</li> <li>• Depending on type, queries take anything between 2% and 40% of the original response time to complete</li> <li>• Storage space reduced by 70%</li> </ul>

**Figure 1** Big Data Solution Profiles In Banking (Cont.)

<b>1-4   Solution profile: service and product development</b>	
Company	Major wealth management firm
Drivers	Streamlining the pricing of bonds based on current reference data and historical data feeds
Solution	<ul style="list-style-type: none"> <li>• Implementation using Hadoop, Python, HDFS</li> <li>• Solution developed by TCS</li> </ul>
Value	<ul style="list-style-type: none"> <li>• More accurate and timely bond prices</li> <li>• Increased market share</li> <li>• 80% faster</li> </ul>
<b>1-5   Solution profile: single view of the customer</b>	
Company	Large European domestic bank with more than 10 million customers
Drivers	<ul style="list-style-type: none"> <li>• Existing CRM approaches not delivering a complete single view of the customer</li> <li>• Need for a bankwide single source of truth for customer data, whatever the source</li> </ul>
Solution	<ul style="list-style-type: none"> <li>• Creation of an enterprisewide data pool for all business units</li> <li>• Single customer view, drawing on a wide variety of data sources such as offices, branches, the contact center, ATMs, and the Web</li> <li>• Advanced analytics</li> </ul>
Value	<ul style="list-style-type: none"> <li>• Improved customer service</li> <li>• Basis for truly personalized offers as well as enhanced cross-selling and upselling capabilities</li> <li>• Reduced time-to-market for new products</li> <li>• Better risk management and fraud analysis</li> </ul>
<b>1-6   Solution profile: risk management and regulatory compliance</b>	
Company	Aareal Bank Group, Germany
Drivers	<ul style="list-style-type: none"> <li>• Need for improved risk, portfolio, and opportunity management</li> <li>• Particular requirement for greater speed in risk management</li> <li>• Better cost control</li> </ul>
Solution	Implementation of SAP BW on Hana
Value	<ul style="list-style-type: none"> <li>• Improved credit risk monitoring</li> <li>• Better management of property loans portfolio</li> <li>• Near-time analysis supports timely reaction to market needs</li> <li>• Annual savings of 50 to 70 person days through increased productivity of business users</li> <li>• Report performance three times faster and more sophisticated</li> <li>• 90% reduction in storage space</li> </ul>

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Source: Forrester Research, Inc.

**Figure 1** Big Data Solution Profiles In Banking (Cont.)

**1-7 | Solution profile: risk management and regulatory compliance**

Company	Major international provider of post-trade services
Drivers	<ul style="list-style-type: none"> <li>Regulators around the world require the more timely and complete ability to monitor and analyze over-the-counter (OTC) trades</li> <li>Reliably manage 50 million messages per day with peaks of 1 million messages in 15 minutes</li> </ul>
Solution	<ul style="list-style-type: none"> <li>Operational data store and data warehouse using operational data store technologies delivered by Polaris FT, supporting near-real-time upload to the data warehouse</li> <li>Capable of handling 50 million messages per day, at the required (often high) levels of velocity and complexity</li> <li>Able to support storage of 15 years of global OTC data, with 200 TB expected in the first year</li> </ul>
Value	Improved regulatory compliance and reduced risk through: <ul style="list-style-type: none"> <li>Global trade repository for all asset classes</li> <li>Near-time availability of data for analysis</li> </ul>

**1-8 | Solution profile: foundational solutions**

Company	Major international bank
Drivers	<ul style="list-style-type: none"> <li>Reduce data integration complexity for hundreds of applications in about 40 countries</li> <li>Gain easier access to globally generated information</li> </ul>
Solution	<ul style="list-style-type: none"> <li>Hadoop and related big data technologies for processing large volumes of data</li> <li>Pentaho for ETL purposes</li> <li>Hbase and Hive database</li> <li>Delivered by Polaris FT</li> </ul>
Value	<ul style="list-style-type: none"> <li>Improved information accessibility and availability due to central data repository for global data</li> <li>Cost reduction due to open source solution</li> <li>Greater flexibility supports the more timely creation of data-driven applications</li> </ul>

## Banks Can Benefit Directly And Indirectly From Big Data

Today, many banks' big data approaches have more of an internal focus. Risk management based on greater speed and a broader range of data not only reduces the risk of loss but also creates the foundation to provide more timely insight into the overall risk situation of a bank — and, eventually, the opportunity for more growth and revenue. Using big data provides banks with a faster path for moving from product-centric approaches to customer-centric ones, making the customer the anchor point of both a bank's application landscape and its architecture. By improving the ability to predict changing market conditions as well as customer preferences and behavior, banks position themselves to define and deliver customer-centric products and services — all the way down to the market of one. This also improves their ability to serve their customers in a way that fosters their loyalty and eventually increases top line growth.

All this is certainly pragmatic and the right way to go. Direct benefits can include improved risk management and revenue uplift, but banks will also see indirect benefits like architectural improvements. However, banks need to go beyond this. Today, only a few are leveraging external data beyond traditional market data feeds or credit scores, but not using external data means not tapping a huge source of value.<sup>6</sup>

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### RECOMMENDATIONS

#### BANKS NEED TO BUILD BIG DATA INTO THEIR STRATEGIC PLANNING

Forrester survey data shows that banks are making data-related projects one of their key priorities and that they use or are planning to use big data. Ongoing initiatives often pragmatically focus on internal data and selected business areas. However, this won't be enough in the long term. Technology management teams need to identify the most promising big data areas — for example, by homing in on the hotspots within their bank's business capability map.<sup>7</sup> More often than not, these hot big data areas will be one of those discussed in this report — customer analytics, single view of the customer, service and product development, risk management and regulatory compliance, and foundational solutions — but they may need strategic extensions to cover data external to the bank as well. However, regardless of big data's high strategic priority, tech management teams will often need to build individual business cases to get funding for individual big data solutions. To do so, they must:

- **Scrutinize the potential business value.** Identify the real business value that you can create by reducing the time to collect and analyze data and thus making faster and more informed decisions; the solution profiles offer a potential starting point. Starting with the customer and customer-facing processes in particular will point to high-value opportunities in a number of cases: A few examples include increasing the number of generated sales leads; enabling more informed definitions as well as changes to and the bundling of banking products and services; identifying the channels best suited for a given combination of customer, product, and service — based on data, not a gut feeling; and optimizing a bank's pricing to eventually drive customer satisfaction and increase revenue.

- **Balance highly differentiated solutions against cost-effectiveness.** For many of the big data topics discussed, off-the-shelf solutions exist — either as an integral or optional part of an off-the-shelf banking platform or a dedicated standalone solution. Tech management teams need to consider carefully whether off-the-shelf offerings are good enough or whether their bank needs a richer, broader, and deeper solution. They must carefully assess whether they can justify the greater cost of highly differentiated products and services in the medium term on the basis of the additional value gained. However, if your existing application landscape is very fragmented and best characterized as a zoo of custom-built and off-the-shelf business apps, a big data approach may be the fastest way to achieve goals like a single view of the customer across all products, services, channels, and business applications.
- **Make sure they don't build yet another silo.** Many big data projects start as skunkworks or research initiatives. This is entirely appropriate, given the nature of some of the technologies — in particular those coming out of the open source ecosystem. But the goal must always be integration with the existing application and systems landscape; otherwise, the result will be another data island with limited scope for adding business value.
- **View the privacy and security implications as more than a risk and compliance issue.** Clearly, you must keep all data associated with customers and their transactions safe and secure. It is also obvious that big data approaches can augment existing risk and fraud management systems. However, you also have an opportunity to improve the customer experience by applying big data techniques in ways that reassure customers that their data is safe — while at the same time making security processes, such as authentication, more transparent and less of a burden.

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## ENDNOTES

- <sup>1</sup> The new focus on the customer and the sheer volume of structured and unstructured information available to financial services firms means efficient analysis is becoming more important. See the September 7, 2011, “[Banking IT In 2023 Updated](#)” report.
- <sup>2</sup> Within the context of this report, we use the term “big data” for data that is currently not being captured for business intelligence (BI)/analytical purposes — either because it's too expensive to do so or because it's technically not feasible with existing data warehouse and BI solutions, or a combination of the two. The data in “big data” can come from internal or external sources, and it can — but need not — involve large volumes as well as high velocity and a great variety of data types. Big data techniques and technologies include massively parallel processing and new types of data stores such as columnar databases. Hadoop and its associated ecosystem of solutions are a key component, but they are not a requirement.
- <sup>3</sup> Across all the lines of business within financial service companies that are using or planning to use big data, IT analytics showed the highest adoption of big data (60%), while procurement had the lowest (9%). Source: Forrsights Software Survey, Q4 2013.

- <sup>4</sup> Software vendors recognize this as well and deliver tailored solutions. An off-the-shelf predictive analytics solution enabled a European bank to improve its response rates and increase its income significantly. A number of vendors are offering or working on solutions that aim to increase the level of automation in order to enable business specialists to use the software with minimal or no involvement from their technology management colleagues.
- <sup>5</sup> For example, like the global wealth management firm mentioned earlier, the firm could leverage its trade repository so that its clients have a better basis for pricing — and the firm an additional revenue stream.
- <sup>6</sup> A significant focus on the customer relationship is a key element of banking of the future. A much better understanding of the customer and a strong focus on customer experience will be key. This approach also needs strong support through real-time or at least intraday analysis of internal and external customer data. See the August 20, 2008, [“Financial Services Of The Future: Collaborative Competition Will Be The Norm”](#) report.
- <sup>7</sup> Forrester has defined a sample business capability map for banking that technology management teams in banks can use as a starting point or just as food for thought for their own capability maps. See the February 16, 2010, [“Bank EAs: Start Working With A Customized Business Capability Map”](#) report.

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