

TRANSFORMING BIG DATA INTO  
COMPETITIVE ADVANTAGE IN THE  
BANKING AND FINANCE INDUSTRIES

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**KEY TAKEAWAYS**

- There are many ways to make big money from big data: customer retention, targeted marketing, fraud reduction, and more.
- It is important to act now to be the first mover. Much of the industry is behind at present, but growing awareness and new regulations will level the playing field eventually.
- Companies that win will be those that best execute in five key areas: strategy, skills, process, systems, and data.

**BIG DATA IN THE FINANCE AND BANKING INDUSTRY**

Big data is quickly gaining recognition in the finance industry: a study of worldwide banking executives reveals that 57% consider big data capabilities to be very important.<sup>1</sup> Even more telling is that 75%<sup>2</sup> of those executives are currently making investments in big data.

While firms are allocating money and resources to big data projects, many are moving forward without the necessary and essential planning or expertise. In fact, only 17% of banking executives surveyed believed they were well prepared to prioritize and implement key projects.<sup>3</sup> Therefore, a firm that can take leverage their data intelligently can gain a competitive advantage.

Most of the banking executives surveyed (75%) believed that big data would give large global and national banks a competitive edge over smaller banks.<sup>4</sup> Large banks have more data to leverage and more resources to put toward projects, but finance institutions of all sizes can benefit from analyzing big data. Many companies that don't have internal data analytics capabilities simply connect with firms that provide data expertise.

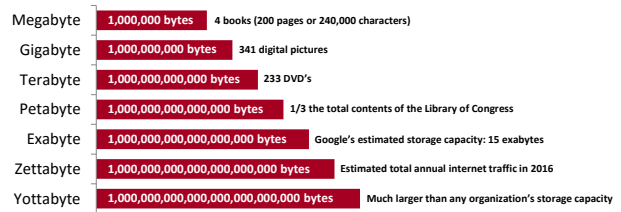
**WHAT IS BIG DATA?**

The media coverage of big data can leave people confused, but it's relatively simple to define the three Vs: volume, velocity and variety. While volume is the obvious part of big data, it is only a component. Combined with velocity and variety, big data's volume offers businesses a huge opportunity.

**VOLUME**

There is no threshold of how large a dataset must be before it is considered big data, though it is most

commonly used to refer to data sets ranging from a few terabytes to many petabytes. While the dividing line between big data and "small data" is somewhat arbitrary, it would not make sense to have a defined threshold since this year's big data is next year's normal-sized data.



**Chart 1: Putting "bytes" in perspective**

It is helpful, however, to know how data is measured. While most people are probably familiar with a megabyte (MB) or a gigabyte (GB), Chart 1 shows a number of other "bytes" that are helpful when speaking of big data.

The volume of big data begins to be more tangible especially considering that more than 20% of large companies have in excess of a petabyte of data.<sup>5</sup> As years pass, data "bytes" will only continue to increase.

**VELOCITY**

After volume, big data can be defined by the velocity at which it is created or received. Velocity points to the end goal of being able to make timely decisions based on data.

In today's world full of sensors on machines/devices and systems that are constantly tracking activity, the velocity at which new data is created is incredible. Streaming data with millisecond response rates creates real opportunities for business leaders, but the speed also presents a very real challenge to extracting that value.

**VARIETY**

In addition to volume and velocity, big data is characterized by its wide variety. Two categories—"structured" and "unstructured" (see Table 1 below)—help make sense of various data, but each category presents unique challenges as businesses seek to extract value from it.

CUSTOMER VALUE MANAGEMENT

Type	Definition	Example
<b>Structured</b>	Data that can be immediately identified within an electronic structure/database	The name of a city from a “city field” in a form
<b>Unstructured</b>	Data that are not in fixed locations and need to be scanned and analyzed	Free-form text in documents, email messages, blogs, etc.

**Table 1:** Structured versus Unstructured Data<sup>6</sup>

Beyond structured and unstructured categories, big data variety can be analyzed from an organization’s perspective: internal vs. external. In addition to capturing internal sales information and data from sensors, organizations can tap into social media to track what others are saying about them on Facebook, Twitter, or other external sites. Companies analyze data to inform their accurate and timely decision making.

**BIG DATA APPLICATIONS IN FINANCIAL SERVICES AND BANKING**

Now that we’ve defined big data, let’s look at how firms in the finance and banking industries are cashing in on it. Data analytics boost returns in many areas, including the following:

- Customer value management
- Customer retention
- Customer scoring and segmentation
- Lead generation
- Fraud detection
- Targeted marketing
- Regulatory compliance

The following sections will define each of these aspects in relation to big data and explain how they make a difference in the company’s bottom line. We will provide specific cases where available.

Firms are now realizing that they are sitting on mountains of data that enable them to understand their customers. Financial firms have data that is particularly revelatory: where customers spend money, how much they spend on different things, how they make, and how their spending habits change over time.

Firms can utilize this data to understand how valuable each individual customer is to them. Since customer value is not static, identifying changes in customer value enables financial institutions to anticipate customers’ needs and stay ahead of the competition.

Historically, financial firms have been slow to respond to changes in customer value. This may be due to the fact that in order to continually track these changes, companies need to combine internal and external data with automated reporting.

A firm that is at the forefront of tracking customer value is Capital One. Capital One’s business is less diversified than other banks, predominantly operating in the volatile credit card issuing space. Over time, almost all other pure-play credit card issuers<sup>7</sup> have gone out of business, but Capital One has succeeded through having a stronger understanding of its customers.

Since the 1990s, Capital One has been mining customer data and credit ratings. All of this data feeds into a proprietary relational database management system, which tracks tens of millions of customers.

This system enables Capital One to tailor offers for credit cards and other products. In fact, there are over 3000 different credit card offer variations sent to over 100,000 customer segments.<sup>8</sup> Capital One is able to test a large number of offer variations quickly and incorporate them into its relational management system. It conducts more than 65,000 “test and learn” campaigns per year to narrow in on which offers are most effective for which types of customer<sup>9</sup>.

By using customer data in this way, Capital One can then set customer acquisition targets for employees at all levels, and provide customer data access for front-line personnel. Ultimately, the firm has come to culturally view itself as an “information-based marketing company,” not a credit card issuer.<sup>10</sup>

## CUSTOMER RETENTION

In the past, firms have seldom analyzed the data they generate when interacting with customers. Now, companies are finding new ways to analyze their customer interactions to discover who is unhappy and about to leave. Being able to identify and take steps to retain customers who are about to leave can mean big money for firms.

The greatest challenge is that the data generated during customer interactions is often voice or text based—phone call recordings, call notes, emails, surveys, etc.—and many firms do not know what to do with information in this form. Additionally, customer interactions are often siloed throughout different parts of the organization. For instance, the team responsible for retaining customers might be separated from the personnel interacting with customers in other situations.

One firm that has cracked how to take advantage of all the voice and text based data coming in is Toyota Financial Services, the auto loan and leasing arm of Toyota. They run speech analytics on over 10 million customer phone calls a year and text analytics on over 40 million call center notes, customer surveys, and social media interactions to isolate customer pain points and identify customers who are about to leave.<sup>11</sup>

Toyota Financial Services tracks all customer interactions by customer and dealership. They have developed a proprietary customer sentiment score based on several kinds of analysis. One type of analysis involves identifying key words customers use when they are about to leave, such as, “I pay my bill on time and have never missed a payment . . .” They then score each dealership and provide them with personalized feedback.<sup>12</sup>

Ultimately, Toyota developed a system that automatically identifies customers who are likely to leave in the next 90 days and sends them a retention offer. As a result, they have seen customer retention rates rise and customer service interactions drop.<sup>13</sup>

## CUSTOMER SCORING AND SEGMENTATION

Insights from customer data are allowing financial firms to segment their customers better than ever before. Finding new market segments allows firms to appeal to an untapped audience and grow their customer base.

However, as segments become smaller and more specific, large institutions wonder if they merit the resource investment. Targeting new customer groups requires a high degree of internal coordination around data analytics, marketing, sales, and other functions and between national and local (branch level) operations.

For example, while struggling to return to pre-recession levels of profitability, Bank of America turned to specialized segmentation to generate growth in new areas of the market. They performed a segmentation based on the banking behavior of over 60 million customers, examining investable assets, differences across those with different types of assets, and the value of those different asset types.

With this segmentation, Bank of America identified a new segment and labelled it the “mass affluent”<sup>14</sup>—people with between \$25,000 and \$1M in investable assets.<sup>15</sup> This group comprises of over 11% of US households, has \$7.5 trillion in assets, is more active with their bank, utilizes more banking services, and is also more apt to switch banks.<sup>16</sup>

To target this segment, Bank of America created a program they call Preferred Rewards. This program tiers customers based on total assets with the bank, and provides benefits across a variety of banking services including savings, checking, investment accounts, loans, credit cards, and more. They promoted this program through a narrowly-targeted ad campaign featuring rock star Billy Idol that aired only during late night talk shows.<sup>17</sup>

Ultimately, Bank of America successfully rolled out Preferred Rewards nationwide and the program now includes over 8 million clients with more than \$600 billion in assets.<sup>18</sup> It has been so successful at growing the business and capturing this segment that other banks are moving to match it, including Citibank, which created a competing program called Citigold.

## LEAD GENERATION

By integrating all of a firm’s customer interactions into the lead sourcing and customer management processes, companies can better identify promising leads and develop tools to convert those leads into customers.

With this approach, the fifth-largest bank in the United States saw their lead conversion rate increase by over 100%. US Bank deployed an analytics solution that compiles data from customer service interactions,

website interactions, and external sources to create a unified view of the customer.<sup>19</sup>

Because much of the data generated by customer interactions is text and voice based, US Bank performs speech and text analytics to make the data usable.

Their system inputs over 400 million monthly interactions into a customer scoring model that rates level of engagement, quality of the lead, and customer value to the bank.<sup>20</sup> That integrated data score then feeds into the bank’s CRM solution, supplying representatives with more relevant leads. The result: US Bank saw their lead conversion rate increase by over 100%.

**FRAUD DETECTION**

Preventing fraud can save companies significant money annually. Credit card fraud alone cost banks \$14 billion in 2013, and it has increased consistently over the last five years.<sup>21</sup> Fraud detection capabilities have dramatically increased in the last decade but must constantly evolve to keep up with fraudsters.

In 2013, Visa rolled out an entirely new analytic fraud prevention engine.<sup>22</sup> With a huge backlog of transactions that could be mined for trends and indicators of fraud, Visa’s engine applied 16 algorithms to study over 500 aspects of a transaction in real time to identify it as fraudulent or not.

Their new system was better than the old in every way:

Old System	New System – Big Data
<ul style="list-style-type: none"> <li>Looked at <b>2%</b> of transactions</li> <li>Based on <b>average fraud rates</b> for merchant categories</li> <li>Studied <b>40</b> aspects of a transaction</li> <li><b>3 days</b> to modify model and add new factors</li> </ul>	<ul style="list-style-type: none"> <li>Analyzes <b>100%</b> of transactions</li> <li>Analyzes <b>actual market</b>, right down to merchant terminals</li> <li>Studies <b>500</b> aspects of a transaction</li> <li><b>1 hour</b> to add attribute to the model</li> </ul>

**Table 2:** Visa’s fraud detection improvements

Ultimately, Visa went from analyzing 2% of their transaction data to analyzing *all* of their transaction

data. There is increased merchant trust of Visa as they improve at detecting fraud.

Most importantly, Visa’s new analytical model identified an enormous \$2 billion in annual incremental fraud.<sup>23</sup>

**TARGETED MARKETING**

Financial firms have the data to give them insights into their customers’ finances and income, which in turn allows them to market to them in a targeted fashion. Further, marketers at other firms want access to the financial firms’ customer base and clientele.

Firms need to tread carefully as they get into this realm because customers do not want to feel that their information is being sold. Goodwill can be lost if firms over market to customers. But if it’s done well, firms can get the right messages to the customers that will be most affected by them.

American Express struck this balance perfectly. Because Amex is a brand recognized for appealing to affluent customers, other companies wanted to tap into Amex’s customer base. Therefore, Amex created Amex Offers, a division that sends targeted offers to cardholders.

By mining its transaction data, Amex began to track the shopping habits of customers who make certain types of purchases and create profiles of people who shopped at certain stores. They found they could predict which card members were likely to engage in specific purchasing behavior.

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With access to profile information, advertisers can push targeted offers to selected audiences. For example, they can send offers for a particular store to people whose shopping patterns are similar to that store’s customers, but who have never purchased at that store.

The result is a win-win for Amex: while providing value and garnering increased customer loyalty by offering deals, Amex strengthens relationships with merchants, ensuring widespread acceptance of its cards.

**BIG DATA AND REGULATORY COMPLIANCE IN FINANCE AND BANKING**

While the intersection of big data and regulatory compliance in the finance and banking industry is a wide-reaching discussion, current and future regulations require firms across multiple geographies to comply with a new requirements related to big data.<sup>24</sup> In many cases, records must be available on demand, or be

normalized and sent to regulators proactively.<sup>25</sup> Regulations across many markets are requiring financial firms to store and access data for several years.

IFRS 9, which takes effect in 2018, will impact big data usage because it requires a forward-looking “expected loss” impairment standard. In other words, IFRS 9 requires banks to provide timely recognition of expected credit losses (ECL) based on future expectations, as opposed to the current “incurred loss” model.<sup>26</sup> To comply, firms will have to implement new models and analytics, and share data across organizations.

As regulations force firms to become proficient at analyzing big data, the competitive advantage of having big data capabilities may diminish. Regulations may also give large firms an advantage over smaller firms, as smaller firms may not have the resources to comply with these regulations.

## BIG DATA IMPLEMENTATION AND CHALLENGES

Companies in the banking industry report that their top five impediments to big data success include:<sup>27</sup>

- Disbursement—too many silos; data is not pooled and therefore hard to analyze
- Time—analyzing large data sets is not quick
- People—shortage of skilled people for data analytics
- Support—big data is not viewed strategically by senior management
- Results—unstructured content in big data is too difficult to interpret

With the right strategies in place, firms can overcome these tangible challenges as the companies described in this paper have done. Some firms will see solutions to these challenges within their organization and be able to implement big data analytics easily. Other firms benefit from professional, third-party support in this endeavor.

If your firm is looking to begin or boost big data analytics, you might use the five-component framework we created at Cicero Group to support our clients:

1. **Strategy:** *Have the right plan and organizational support*
2. **Skills:** *Have the right expertise*

3. **Process:** *Set up the right methods*
4. **Systems:** *Share data across the organization*
5. **Data:** *Address the unique challenges posed by data volume, velocity, and variety*

As you are working to implement these components at your organization, please feel free to contact us for support. With years of experience, Cicero Group has the expertise and resources to help you transform your organization’s use of big data—now and in the future.

## CONCLUSION

Firms that are using big data effectively are capturing tremendous value in customer retention, targeted marketing, fraud reduction, internal operation, and many other areas.

Around customers, aggregated data across varied systems enables advanced segmentation to drive new customer growth and improve marketing ROI. Superior analytics is facilitating predictive cross-sell and upsell opportunities to grow share of wallet and long-term customer value.

Big data also plays an important role in improving operational effectiveness. Cross-organizational data supports new regulatory and compliance requirements and early fraud detection.

Firms can capture competitive advantage using big data. Much of the industry is behind at present, but growing awareness of the value of big data and new regulations will eventually level the playing field. Therefore, it is important to act now to be the first mover.

*Cicero Group is a premier data-driven strategy consulting firm. Cicero integrates inductive problem solving with insightful data analytics to guide business strategy.*

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