

# Big Data and Analytics Use Cases for Banking and Financial Services Industry

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## ABSTRACT

Big Data refers to massive amounts of data captured by IT systems that are too big and complex to be analyzed and processed using conventional software. Using analytics, companies across the world attempt to get insights into customer behavior and also, in certain cases, solve business problems.

The use of Big Data and Analytics in the Banking and Financial Services Industry is not a new phenomenon. Big Data represents a huge opportunity for Banks and Financial Services Industry. The ones who will manage to get the best insights out of the huge amount of structured and unstructured data they already have will be able to better serve their customers and comply to new regulations without putting too much hurdle on their employees.

Banks, have more data about their consumers but relatively very little intelligence about them. The world is increasingly interconnected, instrumented and intelligent and in this new world the velocity, volume, and variety of data being created is unprecedented. As the amount of data created about a consumer by Amazon, Flipkart or other such companies is growing the percentage of data that banks can process is going down fast. The Big Data market is growing exponentially. While banking executives agree that Big Data has the potential to transform their businesses, they are often unsure which Big Data and Analytics Use Cases they should consider when implementing a Big Data solution. While working with banks, Big Data and Analytics use cases can be identified and addressed that are delivering significant business value.

This paper gives an insight on Big Data and Analytics Use Cases for Banking and Financial Services Industry.

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## 1. Introduction

It's widely accepted today that the phrase "big data" implies more than just storing more data. It also means doing more with data. There are arguably too many terms that we use to describe the techniques for big data and big data analytics.

Big data is the term for data sets so large and complicated. Herein it is referred to the exponential growth and wide availability of digital data that are difficult or even impossible to be managed and analyzed using conventional software tools and technologies.

The commonly accepted definition of big data comes from Gartner who define it as high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight, decision making, and process optimization. These are known as the "three Vs". On the other hand, Big Data Analytics is a multi-application, predictive data analytic platform designed as a scalable and extensible prediction engine. It uses all available information whether internal or public to generate predictions while modeling the entire population. Big data analytics is not a single technology, but a data-driven approach one use to develop and deploy customized solutions to business challenges. Delivered through a service model, big data analytics is domain agnostic and can be used in financial

services, transportation, human resources, governments, public sectors and a variety of other agencies and applications.

Digital data, in all shapes and sizes, is growing at astonishing rates. For example, according to the National Security Agency, the Internet is processing 1,826 Petabytes of data per day [1]. In 2011, digital information in the world has grown nine times in volume in just four to five years [2] and by the year 2020, its amount in the world will reach about 35 trillion gigabytes [3]. This explosion of digital data brings big opportunities and potential for various sectors such as enterprises, healthcare, manufacturing, educational services, governments, banks and financial services industry [4].

Banking is one of several vertical industries where this growth will be most pronounced. The new digital consumers are demanding much more from their financial institutions when it comes to quality of service and benefits. To hold onto this audience, banks are heavily investing in integrated channels, CRM, and data collection to better understand and communicate with them. This creates a massive flood of data that needs to be properly managed in order to be effective.

Big data analytics has become increasingly popular, not only in academia, but also in banking, financial services and industrial applications, which can be attributed to the fact that big data analytics offers huge promises as well as imposes grand challenges.[5] Advances in technologies and the

increasing amount of information are transforming how business is conducted in many industries, including banks.

Big data is the new reality for banks both big and small. They need to efficiently parse through large sets of data for meaningful insight and information that can guide the business. It is this insight that leads to better, faster decisions. Database innovations such as in-memory are revolutionizing how structured and unstructured data can be consolidated and analyzed. For banks, it is powering real-time, personalized offers to customers, identifying fraud, and providing a more granular view of credit risks. Most banks have analytical systems in place, but big data takes it to a macro level with deeper insight coming from a multitude of source.

## 2. The Importance of Big Data and Analytics

In this data driven world, Data Analytics has become vital in the decision making processes in the Banking and Financial Services Industry. In banking, volume as well as the velocity of data has become very important factors. Big Data and Analytics comes into picture in cases like this when the sheer volume and size of the data is beyond the capability of traditional databases to collect.

Today, data analytics practices have made the monitoring and evaluation of vast amounts of client data including personal and security informant data-drivens and other financial services industries much simpler.

There are several use cases in which big data and analytics has contributed significantly to ensure effective use of data. This data opens up new and exciting opportunities for customer service that can help defend battlegrounds like payments and open up new service and revenue opportunities.

Big data is also used for personalized marketing, which targets customers based on the analysis of their individual buying habits. Here, financial services firms can collect data from customers' social media profiles to figure out their needs through sentiment analysis and then create a credit risk assessment. This can also help establish an automated, accurate and highly personalized customer support service.

The huge increase in the amount data to be analyzed and acted upon in the Banking and Financial Sector has made it essential to incorporate increase the implementation of Big Data Analytics. Knowing the importance of data science is crucial in these sectors and should be integrated in all decision-making processes based on actionable insights from customer data. Big Data is the next step in ensuring highly personalized and secure banking and financial services to improve customer satisfaction.

Recently, data analytics has become very important in the decision making processes of small and large enterprises. The vast structured and unstructured data generated by many devices in various platforms have given stupendous insights. With the help of data analytics and data management the Banking and Finance Services Industry can use big data to boost organizational success and ensured risk management, profitable growth and performance.

## 3. Big Data and Analytics Use Cases

Over 90% companies believe that Big Data will make an impact to revolutionize their business before the end of this decade. Following Big Data and Analytics Use Cases in Banking and Financial Services Industries will give an insight into how big data can make an impact in banking and financial sector.

### A. Customer Segmentation

Segmentation is categorizing the customers based on their behavior. This helps in targeting the customer in a better way.

Banks are moving now from the label of product centric to customer centric and so targeting individual customer is at most necessary.

Big data analysis is helping them to know about the details like demographic details, transaction details, personal behavior, etc. Based on these data, banks can make a separate list for such customer and can target them based on their interest and behavior.

### B. Personalized Marketing

Personalized marketing is nothing but the next step of highly successful segment-based marketing where customers are divided into a different segment based on some parameters and then follow with them accordingly to convert to sales.

In personalized marketing, we target individual customer based on their buying habits. Industries can take help of the data from e-commerce profiles like what they are buying, what they are browsing etc. to get the data of individual customers. These data will unstructured and so use Big Data technologies; it can be converted into structured and can be analyzed further for personalized marketing.

Companies can also take data from customers' social media profile and can do **sentiment data analysis** to know the habit and interest.

Further risk assessment can be done to decide whether to go ahead with the transaction or not.

### C. Risk Management Analysis

While every business involves risks but a risk assessment can be done to know the customer in a better way. Risk management analysis is one of the key areas where banking sector can save themselves from any kind of fraud and unrecoverable risk.

For this, the best thing is to take help of Big Data technologies like Hadoop and its eco system. Gather the previous record of the customer like loan data, credit card history or their background data and analyze whether they can pay the kind of service they are looking for.

### D. Fraud Detection

Recently millions of customers' credit/debit card fraud had in the news. Several users also found fraud activity from their account. This could have been reduced with the help of big data

and machine learning. The fraud can be detected with predictive analysis.

Based on the machine learning analysis, banks can come to know about the normal activities and transactions a customer does. And whenever they find any unusual behavior, they can immediately blacklist their card or account and inform the customer.

#### **E. Compliance Requirements**

Banking and financial services need to do regular compliance and audit for their data, finance, and other stuff.

They come under regulatory body which requires data privacy, security, etc. Big data analysis can again help in analyzing the data and finding the situation where financial crisis or security issue can occur. This will help the banks and

financial sector to save from any compliance and regulatory issues.

#### **4. Conclusion**

Banks have already started using Big Data to analyze the market and customer behavior but still a lot of need to be done.

From all customer, business and compliance point of view, such analysis is at most required. Big data service provider companies have a great chance to grab this market and take it to the next level. A lot of improvements can be needed in Merchant Account Solutions, Credit card segment such as wireless credit card reader, best credit card swiper, etc. to make it secure and handy for the users. Big data and Analytics can be a game changer in banking and financial services if implemented timely and properly.

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