**Big Data Analytics and Business Intelligence at JP Morgan Chase**

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2022

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# **Literature Review of Big Data Analytics and Business Intelligence at JP Morgan Chase**

## **Background**

In the study of Big data and Business Intelligence application in JP Morgan Chase and Company, the study first sought to understand the current definition of Big data analytics, which software was used to collect and analyze big data, and its significance. The study also defined business intelligence and its significance to business enterprises. Both Big Data analytics definitions were taken from leading companies in both fields: Tableau and IBM.

Tableau is a software known for handling big data and creating informative dashboards that summarize complex data. On the other hand, IBM is a pioneer in cloud computing and the production of machinery that can handle and process big data. The study's objective was to study the application of Big data analytics and Business Intelligence in a fortune 1000 company, the challenges met and how they were overcome. So the study also sought to define what a fortune 1000 company is and why it was important to study a Fortune 1000 company.

Big data analytics refers to identifying trends, patterns, and correlations in vast volumes of raw data to make data-informed decisions. These procedures employ well-known statistical analysis approaches, such as clustering and regression, and apply them to larger datasets with the assistance of modern instruments. Since the early 2000s, when software and hardware capabilities enabled businesses to manage massive volumes of unstructured data, big data has been a buzzword. Since then, new technologies ranging from Amazon to cellphones have added to the massive volumes of data available to enterprises. With the proliferation of data came early innovation initiatives such as Hadoop, Spark, and NoSQL databases for big data storage and processing. As data engineers explore new ways to use data, this discipline evolves. (*Tableau*, 2022)

You can fuel better and faster decision-making, model and predict future outcomes, and enhance business intelligence with big data analytics. Flexible data processing and storage tools can help organizations save costs by storing and analyzing large amounts of data. Open-source software such as Apache Hadoop, Apache Spark, and the entire Hadoop ecosystem mentioned above are ideal tools for big data analysis. (*IBM*, 2022)

Business intelligence (BI) gathers, integrates, analyzes, and presents business information using software technologies, applications, and procedures. BI solutions are no longer nice for any firm looking to enhance performance, increase profitability, or streamline corporate activities. The most effective and successful BI systems can access data from throughout the organization and deliver it in a meaningful way to all lines of business (LOBs) to enhance decision-making. The most effective BI software offers a comprehensive business intelligence platform with analysis and reporting capabilities. BI should be built for scalability, dependability, and performance to provide the relevant and actionable insights that all companies require to make better, more informed decisions and drive effective performance management. (*Oracle, 2022*.)

In this study, the focus will be on JP Morgan and Chase & Company. JPMorgan Chase & Co., headquartered in New York City and incorporated in Delaware, is an American global investment bank and financial services holding corporation. With total assets of $3.744 trillion as of December 31, 2021, JPMorgan Chase is the largest bank in the United States, the world's largest bank by market capitalization, and the fifth-largest bank in the world in total assets. It is also on the Fortune 1000 list of companies.

The Fortune 1000 is an annual ranking compiled by the popular magazine Fortune of the 1000 largest American corporations. Fortune ranks the selected corporations based on revenue earned from core activities, discounted operations, and consolidated subsidiaries. Because revenue is the criterion for inclusion, each firm must be permitted to operate in the United States and submit a 10-K or equivalent financial statement to a government agency. Private organizations are not included on the list since they often conceal information from the public. Companies that fail to disclose comprehensive financial accounts for at least three quarters of the current fiscal year are omitted.

Despite garnering far less attention than the more selective Fortune 500 rankings, the Fortune 1000 is regarded as a significant and respectable list. The yearly list piques the curiosity of readers who follow business and want to learn about the key executives who are the key influencers of the US economy. (*Investopedia*, 2021).

### **Application of Big Data Analytics and Business Intelligence at JP Morgan Chase and Company**

1. Big Data Analytics and Business Intelligence are used to read the US Economy

JPMorgan integrates about 30 million clients' transaction data with publicly available US economic information. JPMorgan data analysts created a data collection of 2.5 million de-identified clients to analyze the income and spending habits of 2.5 million account holders from October 2012 to December 2014. JPMorgan adopted strong privacy standards to secure its clients' information throughout the creation and analysis of these lucrative data assets.

JPMorgan's big data analytics will equip policymakers with all of the tools they need to revitalize the faltering US economy and improve the lives of millions of Americans. JPMorgan is the first financial institution to use big data analytics for the public good. Employers, politicians, and service providers will be able to use the findings to assist individuals in minimizing and managing financial insecurity through ground-breaking tools, programs, and solutions (Veloso et al., 2021).

1. JPMorgan leverages Big Data Analytics for Fraud Detection

In 2014 JP Morgan had a cyber security breach. The bank stated that login information linked with the accounts (such as social security numbers or passwords) was not hacked. Still, hackers gained account holders' names, email and postal addresses, and phone numbers, raising worries about possible phishing attempts. Over 76 million households were affected by that attack (Silver-Greenberg, Goldstein, and Perlroth, 2014). Since then, JPMorgan has been collecting trade data for analysis, but it also tracks phone calls and emails to determine the likelihood of any undetectable fraudulent acts. JPMorgan employs Palantir analytics tools to monitor staff conversations to detect any signs of internal wrongdoing (Brayne, 2020).

1. JPMorgan leverages Big Data Analytics to drive value for Clients

JPMorgan is digitizing remittance information obtained through lockboxes. This information is provided to clients to give detailed insights into the growth of their business. JPMorgan customers may use this information from a lockbox to better respond to customer inquiries, anticipate cash, and improve the reporting of financial transactions to their receivable systems. JPMorgan uses big data and analytics to produce value for customers by providing information for measuring their performance against peers and rivals (Malhotra, 2018).

1. JPMorgan leverages Big Data Analytics for Effective Cash Management

JP Morgan helps its customers manage their working capital and cash forecasting demands by utilizing predictive analytics and complex forecasting algorithms. JP Morgan uses predictive analytics to rationalize or optimize applications, estimate cash flows across client accounts, give deep insight into gaps in the payments process workflow, and improve end-to-end cash management efficiency. JPMorgan's sophisticated forecasting services, which use predictive analytics, assist customer relationship managers in discussing changes in limitations and credit lines to maximize cash balances (Malhotra, 2018).

Big data analytics is a significant differentiator for JPMorgan for making smart, focused investments and providing tailored customer experiences that help drive company development, encourage improved risk behaviors in the organization, and decrease overall costs.

## **Research Questions**

During the research study, the objectives that were set out to be achieved by each of the papers that were studied meant to answer the following questions:

1. What are the current applications of Big data at JP Morgan Chase and Co.?
2. Which software and tools are being leveraged at JP Morgan and Co.?
3. What challenges has the company faced in the past, and is it currently facing?
4. How did the company overcome the challenges?
5. Which challenges did the company fail to overcome?

## **Research Methodology**

In the research done (Alade, 2017), a case study was taken to study Business Intelligence tools used in finance, and JP Morgan Chase was one of the banks studied. The other studies that were used the multiple case study approach. The case study approach was the best approach to studying the impact and challenges of using Big data analytics and Business Intelligence. It provided a realistic implementation of the two aspects, the challenges that companies faced and how they overcame them.

## **Data Analysis**

One of the most difficult aspects of understanding big data is keeping up with the velocity-generated data. Big data can originate from various sources, including the web, mobile, email, social media, and networked smart devices. They frequently contain data that is created at a rapid pace and in a variety of formats, ranging from organized (database tables, Excel sheets) to semi-structured (XML files, websites) to unstructured (text files) (images, audio files). Furthermore, organizations have yet to properly comprehend the capture, storage, and analysis of unstructured data—primarily what big data consists of—and its applications and execution (Alade, 2017).

To solve these issues, the firm has used the following four strategies:

1. Performance management: entails analyzing a company's transactional data, which entails combining all of the company's internal data and producing a holistic picture from which insights may be derived. For example, mining and monitoring internal and trade data and researching trends.
2. Data exploration: comprises using statistics on current data to forecast future results by researching historical consumer behavior to provide previously unseen answers to retain consumers, reduce attrition, participate in target marketing, and cross and upsell. Making and providing data-driven goods has increased customer/client satisfaction, resulting in increased clientele and diversification of the company's activities (Vijh, 2021).
3. Social analytics include analyzing non-transactional data to get valuable insights for businesses via social media sites/apps and tracking engagements/views on videos and conversion rates. In the last five years, the importance of social media has grown. One of its benefits is a platform for businesses to advertise their services, giving them a chance to gain more clientele. Companies may now grasp current trends, and product assessment and feedback can be obtained as quickly as feasible. Cancel culture has caused organizations to be more stringent with their requirements and provide better customer service, all of which have boosted its success.
4. Decision science likewise uses non-transactional data from social media, but this time to discover and pick the best course of action based on what consumers resonate with based on their involvement with certain posts or campaigns. The organization may also evaluate current trends and how to capitalize on them.

Using all of the tools that can provide organizations with the benefits of Big data analytics and Business Intelligence requires some level of expertise that many organizations may not have, which is why three things can be done to engage big data fully; organizations must educate willing members of the organization who have the potential to carry out these activities, and if such people are not within an organization, they must be acquired. Finally, these people must be Acquired. As a result, there is a greater need for data analysts and data scientists (Raisch and Krakowski, 2021).

JP Morgan Chase has also become one of the pioneers in Big Data analytics in finance. One such activity that has made the company be referred to as a pioneer in the use of knowledge graphs. Knowledge Graphs (KGs) have developed as a clear concept for organizing the world's structured knowledge and a means of integrating data acquired from diverse sources, making them suitable for BIg data. Knowledge graphs are increasingly used to represent information retrieved through natural language processing and computer vision. To improve predictions, domain information described in KGs is being fed into machine learning models. JPMorgan Chase (JPMC) is leading this trend by leveraging knowledge graphs across the organization for multiple mission-critical applications such as risk assessment fraud detection, investment advice, and other areas (Ding et al., 2021).

## **Conclusion**

Some of the problems with Big data that were faced earlier on were: Keeping up with the velocity at which data is generated. Furthermore, organizations have yet to properly comprehend the capture, storage, and analysis of unstructured data—primarily what big data consists of—and its applications and execution (Alade, 2017). However, advancements in technology and the creation of software like Hadoop and Bi tools have made it easier to handle data.

Some of the strategies that companies like JP Morgan Chase have come up with to draw better insights from Big data are performance management, social analytics, data exploration and Decision science.

Knowledge Graphs (KGs) have developed as a clear concept for organizing the world's structured knowledge and a means of integrating data acquired from diverse sources, making them suitable for BIg data. JPMorgan Chase (JPMC) is leading this trend by leveraging knowledge graphs across the organization for multiple mission-critical applications such as risk assessment fraud detection, investment advice, and other areas (Ding et al., 2021)

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