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Top big data analytics use cases

Big data can benefit every industry and every organization. Discover the top twenty-two use cases for big data.

Introduction

Organizations are able to access more data today than ever before. But it's of no value unless you know how to put your big data to work.

To get started on your big data journey, check out our top twenty-two big data use cases. Each use case offers a real-world example of how companies are taking advantage of data insights to improve decision-making, enter new markets, and deliver better customer experiences. The use cases cover the six industries listed below.

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If yours isn't among them, you'll still find the use cases informative and applicable. To learn more, contact us.

Manufacturing

The digital revolution has transformed the manufacturing industry. Manufacturers are now finding new ways to harness all the data they generate to improve operational efficiency, streamline business processes, and uncover valuable insights that will drive profits and growth.

01 Predictive maintenance

Big data can help predict equipment failure. Potential issues can be discovered by analyzing both structured data (equipment year, make, and model) and multi-structured data (log entries, sensor data, error messages, engine temperature, and other factors). With this data, manufacturers can maximize parts and equipment uptime and deploy maintenance more cost effectively.

This data can be used to predict more than just equipment failure. For many manufacturing processes, it's also important to predict the remaining optimal life of systems and components to ensure that they perform within specifications. Falling out of tolerance—even if nothing is broken—can be as bad as failure. For example: in drug manufacturing a faulty, but still functional, component could introduce too much or too little of the active ingredient.

Challenges

Companies must integrate data coming from different formats and identify the signals that will lead to optimizing maintenance.

02 Operational efficiency

Operational efficiency is one of the areas in which big data can have the most impact on profitability. With big data, you can analyze and assess production processes, proactively respond to customer feedback, and anticipate future demands.

Challenges

Data teams must balance the data volume with the growing number of sources, users, and applications.

03 Production optimization

Optimizing production lines can decrease costs and increase revenue. Big data can help manufacturers understand the flow of items through their production lines and see which areas can benefit. Data analysis will reveal which steps lead to increased production time and which areas are causing delays.

Challenges

Optimizing production requires manufacturers to analyze their production equipment data, material use, and other factors. Combining the different kinds of data can pose a challenge.

Retail

Competition is fierce in retail. To stay ahead, companies strive to differentiate themselves. Big data is being used across all stages of the retail process—from product predictions to demand forecasting to in-store optimization. Using big data, retailers are finding new ways to innovate.

04 Product development

Big data can help you anticipate customer demand. By classifying key attributes of past and current products and then modeling the relationship between those attributes and the commercial success of the offerings, you can build predictive models for new products and services. Dig deeper by using the data and analytics from focus groups, social media, test markets, and early store rollouts to plan, produce, and launch new products.

Challenges

Companies will have to analyze what can be a high volume of data coming in varying formats, and then create segments according to customer behavior. They will also have to identify sophisticated use patterns and behavior and map them to potential new offerings.

05 Customer experience

The race for customers is on. Big data provides retailers with a clearer view of the customer experience that they can use to fine-tune their operations. By gathering data from social media, web visits, call logs and other company interactions, and other data sources, companies can improve customer interactions and maximize the value delivered. Big data analytics can be used to deliver personalized offers, reduce customer churn, and proactively handle issues.

Challenges

Integrating a high volume of data from various sources can be difficult. Once the data is integrated, path analysis can be used to identify experience paths and correlate them with various sets of behavior.

06 Customer lifetime value

All customers are valuable. But some are more valuable than others. Big data provides you with insights on customer behavior and spending patterns, so you can identify your best customers. Once you know who they are, marketing can target them with special offers. Sales teams can devote more time to them. Customer service can work more proactively if it appears they may leave.

Challenges

To identify your high-value customers, you will need to analyze a high volume of customer transaction data and create sophisticated models that examine past behavior and predict future actions.

07 The in-store shopping experience

Big data can be used to improve the in-store experience. Many retailers are starting to analyze data from mobile apps, in-store purchases, and geolocations to optimize merchandizing encourage customers to complete purchases.

Challenges

Complex graphs and path analyses are required to identify customer paths and behavior. This data must then be correlated and joined with multiple datasets to correctly analyze store behavior.

08 Pricing analytics and optimization

Retailers need to know the true profitability of their customers, how markets can be segmented, and the potential of any future opportunities. End-to-end profit and margin analysis can help with identifying pricing improvement opportunities and areas where profits may be leaking.

Challenges

To correctly analyze pricing data, retailers need to manage millions of pieces of transaction data and work with many different kinds of data sets.

Healthcare

Healthcare organizations are using big data for everything from improving profitability to helping save lives. Healthcare companies, hospitals, and researchers collect massive amounts of data. But all of this data isn't useful in isolation. It becomes important when the data is analyzed to highlight trends and threats in patterns and create predictive models.

09 Genomic research

Big data can play in a significant role in genomic research. Using big data, researchers can identify disease genes and biomarkers to help patients pinpoint health issues they may face in the future. The results can even allow healthcare organizations to design personalized treatments.

Challenges

The volume of genome data is enormous, and running complex algorithms on the data is complicated and can require long processing times.

10 Patient experience and outcomes

Healthcare organizations seek to provide better treatment and improved quality of care—without increasing costs. Big data helps them improve the patient experience in the most cost-efficient manner. With big data, healthcare organizations can create a 360-degree view of patient care as the patient moves through various treatments and departments.

Challenges

Improving the patient experience requires a large volume of patient data, some of which could be multi-structured data, such as doctor notes or images. Additionally, to analyze patient journeys, path and graph analyses are often needed.

11 Claims fraud

For every healthcare claim, there can be hundreds of associated reports in a variety of different formats. This makes it extremely difficult to verify the accuracy of insurance incentive programs and find the patterns that indicate fraudulent activity. Big data helps healthcare organizations detect potential fraud by flagging certain behaviors for further examination.

Challenges

Claims fraud analytics is a complex process that involves integrating different data sets, analyzing the claims data, and identifying complex fraud patterns.

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Healthcare billing analytics

Big data can improve the bottom line. By analyzing billing and claims data, organizations can discover lost revenue opportunities and places where payment cash flows can be improved. This use case requires integrating billing data from various payers, analyzing a large volume of that data, and then identifying activity patterns in the billing data.

Challenges

Sifting through large volumes of data can be complicated, especially when it comes to integrating different data sources.

Oil and gas

For the past few years, the oil and gas industry has been leveraging big data to find new ways to innovate. The industry has long made use of data sensors to track and monitor the performance of oil wells, machinery, and operations. Oil and gas companies have been able to harness this data to monitor well activity, create models of the Earth to find new oil sources, and perform many other value-added tasks.

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Predictive equipment maintenance

Oil and gas companies often lack visibility into the condition of their equipment, especially in remote offshore and deep-water locations. Big data can help by providing insight so companies can predict the remaining optimal life of their systems and components, ensuring that their assets operate at optimum production efficiency.

Challenges

Machine, log, and sensor data from different types of equipment comes in varying formats. Integrating all of this data can be difficult. Moreover, the data needs to be analyzed quickly and put into operation to effectively prevent downtime.

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Oil exploration and discovery

Exploring for oil and gas can be expensive. But companies can make use of the vast amount of data generated in the drilling and production process to make informed decisions about new drilling sites. Data generated from seismic monitors can be used to find new oil and gas sources by identifying traces that were previously overlooked.

Challenges

To discover potential new oil deposits, companies will need to integrate and analyze an enormous volume of unstructured data.

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Oil production optimization

Unstructured sensor and historical data can be used to optimize oil well production. By creating predictive models, companies can measure well production to understand usage rates. With deeper data analysis, engineers can determine why actual well outputs aren't tallying with their predictions.

Challenges

This use case involves analyzing a large volume of data. Complex algorithms are also needed to identify the curve shape associated with that data to identify trends.

Telecommunications

The popularity of smart phones and other mobile devices has given telecommunications companies tremendous growth opportunities. But there are challenges as well, as organizations work to keep pace with customer demands for new digital services while managing an ever-expanding volume of data.

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Optimize network capacity

Optimal network performance is essential for a telecom's success. Network usage analytics can help companies identify areas with excess capacity and reroute bandwidth as needed. Big data analytics can help them plan for infrastructure investments and design new services that meet customer demands. With new insights, telecoms are able maintain customer loyalty and avoid losing revenue to competitors.

Challenges

In addition to creating complex models of relationships between network services and customers, network usage analytics requires analyzing a high volume of call detail records.

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Telecom customer churn

By analyzing the data telecoms already have about service quality, convenience, and other factors, telecoms can predict overall customer satisfaction. And they can set up alerts when customers are at risk of churning—and take action with retention campaigns and proactive offers.

Challenges

This use case requires analyzing past and current data to create a new model to predict churn, which can be done with time-series and relational analytics to identify patterns and behavior. Graph analytics helps identify relationships between customers who have recently churned and current customers who may be more likely to churn because they know someone who has churned.

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New product offerings

Big data provides valuable insights to help companies design new products and features. An improved understanding of customer behavior enables companies to tailor services to different customer segments for future offerings.

Challenges

This use case requires analyzing high-volume product-log data in different formats. Telecoms need to create viewing segments according to customer behavior and identify sophisticated use matters and behavior to map to service features.

Financial services

Forward-thinking banks and financial services firms are capitalizing on big data. From capturing new market opportunities to reducing fraud, financial services organizations have been able to convert big data into a competitive advantage.

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Fraud and compliance

When it comes to security, it's not just a few rogue hackers. The financial services industry is up against entire expert teams. While security landscapes and compliance requirements are constantly evolving. Using big data, companies can identify patterns that indicate fraud and aggregate large volumes of information to streamline regulatory reporting.

Challenges

This data requires the integration of different transaction datasets with additional information, such as interaction events and customer behavior. To identify potential fraud patterns, companies will need to sift through a large volume of data.

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Drive innovation

Big data offers valuable insights that help organizations innovate. Big data analytics makes the interdependencies between humans, institutions, entities, and processes more apparent. With better understanding of market trends and customer needs, organizations can improve decision-making about new products and services.

Challenges

Collecting and aggregating disparate data sources can be difficult.

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Anti-money laundering

Financial services firms are under more pressure than ever before from governments passing anti-money laundering laws. These laws require that banks show proof of proper diligence and submit suspicious activity reports. In this extraordinarily complicated arena, big data analytics can help companies identify potential fraud patterns.

Challenges

This use case requires analyzing large volumes of transaction data (which can include structured and multi-structured data) and then identifying complex AML transactions. In addition, graph analytics will reveal the hidden relationships.

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Financial regulatory and compliance analytics

Financial services companies must be in compliance with a wide variety of requirements concerning risk, conduct, and transparency. At the same time, banks must comply with the Dodd-Frank Act, Basel III, and other regulations that require detailed reporting.

Challenges

Financial services companies must bring together a large volume of data, create advanced risk models, and do this quickly without adversely affecting other projects.

Conclusion

In addition to the twenty-two use cases described above, there are hundreds of other ways big data can be used to give your business a competitive advantage.

To learn more, contact us today or go to oracle.com/big-data to learn first-hand how your big data can work for you.

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