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Assignment 1-DAL 371

Ofentse Mapheto

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Introduction

Big data refers to the massive volume of structured and unstructured data that inundates businesses daily. It is characterized by its 3 Vs: volume, variety, and velocity. The proliferation of digital technologies and the internet has led to an exponential growth in the amount of data being generated and collected. The potential benefits of big data are significant, including improved decision-making, increased operational efficiency, and the ability to gain insights that can drive performance.

Google

Is one of the most well-known tech giants and a leader in the big data industry. They have been using big data to drive business performance for many years. In this case study, we will take a closer look at how Google uses big data to achieve business success.

Big Data Collection and Analysis:

Google's business model revolves around data collection, analysis, and monetization. They collect vast amounts of data from various sources, such as search queries, social media, and website analytics. They use advanced analytics tools to process and analyze this data, allowing them to understand user behavior and preferences, and create personalized experiences for their users.

Personalized Advertising:

Google uses big data to provide targeted and personalized advertising to its users. They analyze user data to understand their interests, demographics, and behavior patterns, and then use this information to deliver highly relevant ads to each user. This not only benefits Google by generating revenue from ads but also benefits advertisers by increasing the effectiveness of their campaigns.

Improving Search Results:

Google uses big data to improve the accuracy and relevance of its search results. They analyze user search queries to understand what users are looking for and use this information to refine their algorithms. This helps Google provide more relevant search results to its users, improving the user experience and driving traffic to its website.

Predictive Analytics:

Google also uses big data to make predictions about future trends and behaviors. They use machine learning algorithms to analyze large datasets and identify patterns and trends that can help them anticipate future events. This allows them to make informed business decisions and stay ahead of the competition.

Cloud Services:

Google offers cloud services to businesses, which use big data to provide insights and analytics. Google Cloud Platform offers big data tools such as BigQuery, Dataflow, and Cloud Dataproc, which allow businesses to store, process, and analyze large datasets. This helps businesses to make informed decisions based on data insights, improving their performance and competitiveness.

Amazon

Is one of the world's largest online retailers that sells a wide range of products and services, including electronics, clothing, and food. The company leverages big data to improve its business performance in various ways, such as increasing sales, reducing costs, and improving customer experience. In this case study, we will explore how Amazon uses big data to drive business performance.

Customer Personalization

Amazon uses big data to personalize the customer experience. By analyzing customers' purchase history, browsing behavior, and demographic data, Amazon can recommend products that are relevant to the customer's interests and needs. The recommendation engine uses machine learning algorithms to identify patterns in customer data and provide personalized recommendations. This personalized approach has led to an increase in customer loyalty and higher sales for Amazon.

Inventory Management

Amazon leverages big data to optimize inventory management. The company uses predictive analytics to forecast demand for products, allowing it to stock products in the right quantity at the right time. By analyzing historical sales data, seasonal trends, and other factors, Amazon can optimize inventory levels, reducing stockouts and excess inventory. This approach has led to a reduction in costs and an increase in efficiency.

Pricing Optimization

Amazon uses big data to optimize its pricing strategy. The company analyzes competitors' prices, historical pricing data, and demand forecasts to adjust prices in real-time. By using dynamic pricing algorithms, Amazon can offer the best price to customers while maintaining profitability. This approach has led to higher sales and revenue for Amazon.

Fraud Detection

Amazon uses big data to detect and prevent fraud. The company analyzes customer behavior and transaction data to identify potential fraud patterns. By using machine learning algorithms, Amazon can detect fraudulent activities in real-time and take appropriate actions to prevent fraud. This approach has led to a reduction in fraudulent activities and an increase in customer trust.

Logistics Optimization

Amazon leverages big data to optimize its logistics operations. The company uses data from various sources, such as GPS trackers, weather forecasts, and traffic data, to optimize delivery routes and reduce delivery times. By using machine learning algorithms, Amazon can predict delivery times accurately, reducing customer complaints and improving customer satisfaction. This approach has led to an increase in efficiency and cost savings for Amazon.

Facebook

Is one of the largest social media platforms in the world, with over 2.8 billion monthly active users as of December 2020. Facebook leverages big data to drive business performance by collecting, analyzing, and utilizing user data to improve user engagement, personalization, and advertising effectiveness.

Personalization through the News Feed Algorithm:

One of the ways Facebook leverages big data is through its News Feed algorithm, which is constantly updated to personalize each user's experience. The algorithm uses various data points, such as a user's past activity, likes, and demographic information, to deliver relevant content to the user's News Feed. This personalized experience increases user engagement, and the amount of time users spend on the platform.

Improving Advertising Effectiveness:

Facebook also uses big data to improve its advertising platform. Advertisers can use Facebook's data to target specific audiences based on their interests, behavior, and demographics. Facebook's data analytics tools allow advertisers to monitor the performance of their ads and optimize their campaigns based on user engagement and conversion rates.

Product Development and Improvement:

Facebook uses big data to improve its products and services. For example, Facebook uses data analytics to identify areas where user experience can be improved and to test new features and designs. This allows Facebook to continuously improve its platform and stay ahead of its competitors.

Fraud Prevention and Detection:

Facebook also uses big data to monitor and prevent fraud and abuse on its platform. Facebook's data analytics tools allow it to detect suspicious behavior and patterns, such as fake accounts and spam, and take action to remove them from the platform.

General Electric

(GE) is a multinational conglomerate that operates in various industries, including aviation, healthcare, energy, and transportation. The company has been using big data to improve its operations, reduce costs, and drive business performance.

Predictive Maintenance:

GE's aviation division has been using big data to improve aircraft maintenance. The company has developed a system that collects data from sensors installed on aircraft engines and analyzes it to predict when maintenance is required. This system allows GE to perform maintenance before a failure occurs, reducing downtime and improving safety.

Supply Chain Optimization:

GE's transportation division uses big data to optimize its supply chain. The company has developed a system that collects data from suppliers and logistics partners, allowing it to track the movement of

goods and identify bottlenecks in the supply chain. This system has helped GE reduce its inventory levels and improve its delivery times.

Data-Driven Healthcare:

GE's healthcare division has been using big data to improve patient outcomes. The company has developed a system that collects data from medical devices, electronic health records, and other sources, allowing it to analyze patient data and identify patterns that can help doctors make more informed decisions. This system has helped GE's customers improve patient outcomes and reduce costs.

Digital Twin Technology:

GE's energy division uses big data to improve the performance of its power plants. The company has developed a system that creates a digital twin of each power plant, allowing engineers to simulate different operating conditions and identify ways to improve efficiency. This system has helped GE's customers reduce their energy costs and improve their environmental performance.

Microsoft

Is one of the biggest technology companies in the world, known for its innovative products and services. The company has successfully leveraged big data to drive business performance in various ways. In this case study, we will explore some of Microsoft's big data initiatives and their impact on the company's performance.

Power BI: Empowering Data-Driven Decision Making:

Power BI is a business analytics service provided by Microsoft that enables users to create interactive dashboards and reports. The service is built on Microsoft's Azure cloud platform, which provides scalability, reliability, and security. Power BI leverages big data by enabling users to connect to various data sources, including structured and unstructured data, and transform it into meaningful insights. With Power BI, businesses can quickly analyze vast amounts of data, identify patterns, and make data-driven decisions. Power BI has helped Microsoft streamline its internal reporting processes, providing real-time insights into sales, marketing, and financial performance.

Azure Machine Learning: Building Intelligent Systems:

Microsoft's Azure Machine Learning is a cloud-based platform for building, deploying, and managing machine learning models. The platform enables businesses to train and deploy custom machine learning models on large datasets, providing predictive insights into various aspects of their operations. Azure Machine Learning leverages big data by using Microsoft's vast dataset to train machine learning models, which can be customized by businesses to meet their specific needs. Azure Machine Learning has enabled Microsoft to build intelligent systems that automate various aspects of their operations, such as predictive maintenance and fraud detection.

Microsoft Dynamics 365: Personalizing Customer Experiences:

Microsoft Dynamics 365 is a cloud-based enterprise resource planning (ERP) and customer relationship management (CRM) software that provides businesses with a unified platform for managing their

operations and customer interactions. The software leverages big data by providing businesses with real-time insights into customer behavior, preferences, and buying patterns. With Dynamics 365, businesses can personalize customer experiences, providing tailored recommendations and offers based on their previous interactions with the company. Dynamics 365 has helped Microsoft improve its customer engagement, resulting in increased customer satisfaction and loyalty.

Five South African businesses that put big data at the center of their business model.

Pick n Pay:

Pick n Pay, one of South Africa's largest retail chains, has put big data at the center of its operations. The company collects data on customer transactions, which it uses to analyze purchasing patterns and develop personalized marketing campaigns. With the help of big data analytics, Pick n Pay is able to offer its customers personalized discounts, promotions and recommendations based on their purchase history and behavior. Additionally, the company is using data to improve its inventory management and supply chain operations, resulting in better stock availability and reduced waste.

Vodacom:

Vodacom, a leading telecommunications provider in South Africa, is using big data analytics to gain insights into its customers' behavior and preferences. The company uses data collected from its mobile network to understand how customers are using their phones, including what apps they are using, how long they are spending on each app, and what times of day they are most active. Vodacom uses this data to develop new products and services that better meet its customers' needs, as well as to improve its network performance and customer service.

Absa Bank:

Absa Bank, one of South Africa's largest banks, is using big data analytics to improve its risk management and fraud detection capabilities. The bank uses data from a variety of sources, including customer transactions and social media, to develop predictive models that can identify potential fraud or credit risk. This allows the bank to take proactive measures to prevent fraud or minimize the impact of credit losses.

Discovery Health:

Discovery Health, one of South Africa's largest health insurance providers, has put big data at the center of its operations. The company collects data from a variety of sources, including wearable devices, electronic health records, and medical claims, to gain insights into its customers' health and wellness. With the help of big data analytics, Discovery Health is able to develop personalized health and wellness programs for its customers, as well as identify potential health risks and provide proactive care.

Sanlam:

Sanlam, one of South Africa's largest financial services companies, is using big data analytics to better understand its customers and develop new products and services. The company collects data from a variety of sources, including customer transactions and social media, to gain insights into its customers' behavior and preferences. With the help of big data analytics, Sanlam is able to develop new products

and services that better meet its customers' needs, as well as improve its customer service and engagement.

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