case study- Big Data Analytics on Walmart

by Rahul K. Ravindran

A CASE STUDY ON

WALMART

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Abstract

This century has witnessed an unprecedented explosion in the usage and utilization of data across various industries, and data became an unavoidable element in the fundamental growth of governments, businesses, and individuals. This case study examines the impact of big data analysis and its associated tools within Walmart, one of the largest retailer shops in the world. Our main highlight is how Walmart approaches big data for improving customer satisfaction, cost reduction, operational efficiency, and so on.

Introduction

Our world has become a data-driven world; the role of big data analysis and its operations has made a significant impact on understanding customer behaviour and trying to optimize their activities through customer experiences. In this work we have selected Walmart, one of the world's largest retailers, and we mainly focus on the strategies they used for big data and various tools it used for maintaining their operations. Walmart collects billions of data across global network through stores and e-commerce platforms. Using big data technologies like Hadoop, Cassandra, and sophisticated machine learning algorithms which will convert the raw data into meaningful information to make better decision-making. Moreover, this case study explores how the processing of big data takes place, which gives a diverse knowledge of Walmart's sustainability and marketing leadership.

What is Big Data?

Big data is a collection of a large volume of structured and unstructured datasets from various resources that is used for optimizing and increasing the operational efficiency of an organization.

Why Big data is important?

Now a days, big data makes a significant impact on the real world. The importance of big data doesn't depend on how much data you collect; the way we process that raw data to make meaningful information to make better decision-making plays a major role.

What is Walmart?

Walmart is an American multinational retailer shop that operates vast number of hypermarkets, discount department stores and grocery stores from United States. It makes $36 million across 4300 hypermarkets and employees close to 2 million people.

Domination of Walmart in the market field

1. They are able to offer low price for commodities and this possible by huge volume of sales due to spread of operations and wide customer base.

2. Their efficiency is increased by huge supply chain management system.

3. They have centralized database to know when to ship more products, the database contains point of sales data, warehouse inventory and real time sales.

How Walmart uses Big data to increase their operational efficiency?

Walmart approaches more than one terabyte of recent facts and prehistoric statistics every day because they've got huge data surroundings. Evaluation includes hundreds of thousands of merchandises and tens of millions of customers across a worldwide network. Almost a hundred million keywords are chosen on a daily basis with the aid of the analytics crew for key-word bidding. The primary objective of approaching large statistics at Walmart is to understand the purchasing experience of customers when they're at the shop or shopping through an e-trade platform just like the Walmart internet site. The big statistics analysts had been able to identify that there has been a huge difference in sales after implementing massive facts techniques; they have been capable of producing earnings of 10 to fifteen percent. Walmart Labs analysed each clickable movement on Walmart.com, which includes what customers buy from the online and offline stores, what is trending in the marketplace, and many others.

Ecosystem and Tools

Tech Architecture and Online Marketing Ecosystem
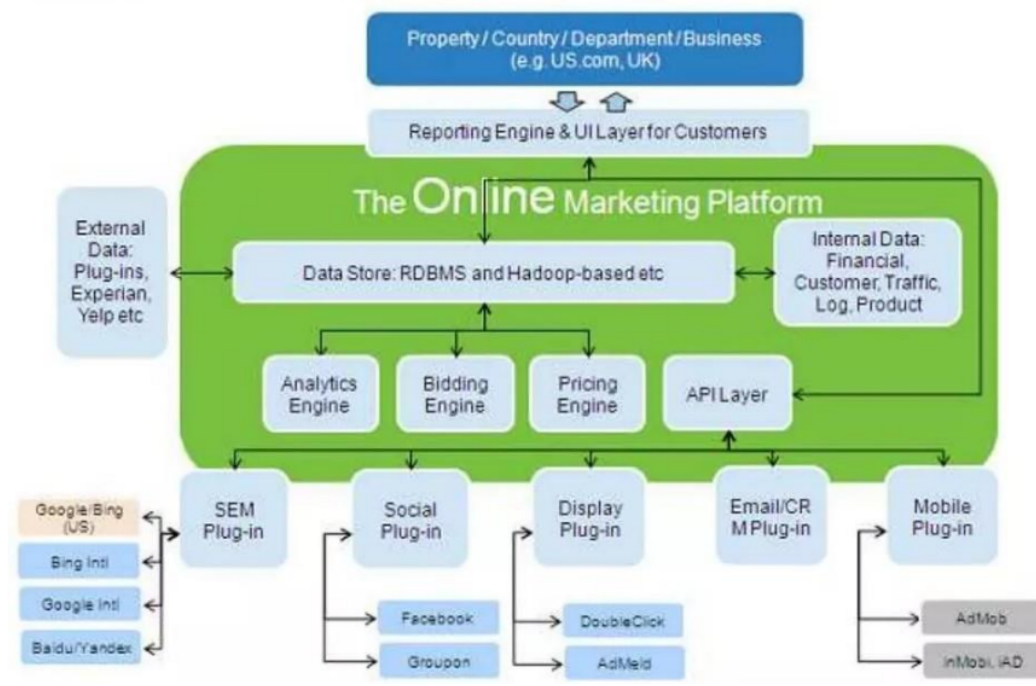
Walmart uses Hadoop and other big data tools for improving customer approach and experience, business decisions, and to implement new strategies. Hadoop provides a high-throughput distributed file system to access data by replicating data across multiple nodes. There is an application called Savings Catcher, which will send notifications to the customer whenever there is a reduction.

in the price of a product by the neighbouring competitor that is already bought by the customer, and also provide gift vouchers to the customer to compensate the price difference. A mapping

application is maintained by Hadoop, which breaks the task into subtasks and processes them in parallel.
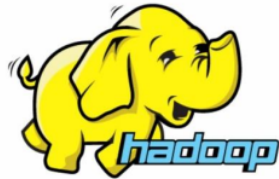
Data Ingestion in Walmart is performed by Apache Flume and Apache Sqoop. For data processing, analysts use tools like Apache Hive, Pig, etc. For real-time analysis, Apache Spark is used with a machine learning algorithm to process real-time streaming of data. Tableau and power BI plays a significant role in the data visualization part, which includes creating sales reports and dashboards.

Cassandra is another tool used in Walmart for big data processing; it also provides a distributed architecture and makes sure that replicated data is distributed across the multiple nodes. One of the main advantages of this distributed system is scalability and flexible schema. Through scalability, Walmart is able to add more nodes to handle large volumes of data without performance degradation, and flexible schema ensures to store diverse data types to
And makes changes according to the business requirements.

How Walmart track customers?

With the help of data mining, Walmart produces certain patterns in the point of sale, which helps to provide product recommendations to users based on the product they bought. Walmart tracks every customer individually, and they have data close to 145 million. The data consist of what they buy, where they live, and what products they search in their e-commerce platforms. The analyst at Walmart Labs considers every clickable action performed by customers on their website and also follows what's trending on Twitter and local events, etc. Following these steps, they will get a clear buying pattern of an individual. And these data are transformed into big data, and with the help of meaningful algorithms, the organization is able to make a better business decision.

Social media as a solution for Big data

A large amount of data-driven decisions made by Walmart are through social media platforms like Twitter, Facebook, Pinterest etc.

Walmart Labs is an analyst team developed by Walmart for generating retailed big data through these social platforms, analysing the data, and understanding the customer requirements. They constantly use a refreshed database, which consists of 200 billion rows, and mainly focus on the most recent transaction.

Social Genome

Social Genome is a tool developed by Walmart Labs to analyse social platforms like Facebook, YouTube, etc. Through this, Walmart is able to approach a customer or their friend if they mention a Walmart product to them to inform them about the product and offer a discount

Mobile App as a solution

Half of the customer base of Walmart is using the mobile app of Walmart. And these apps consist of certain features that help the customers to know the position of their wants and help them by providing discounts. Another method used by Walmart to leverage the big data is that whenever a customer enters the shop, the app has a geofencing feature that asks the user to enter the store mode, which helps the user to scan the QE code and to know about the discount on the products they like to buy.

Conclusion

The inventory of big data at Walmart has made a significant impact on their revenue, business operations, and strategies they adopt. The introduction of analyst teams like Walmart Labs helps the organization to make better decision-making. Implementation of distributed file systems like Hadoop and Cassandra provides Walmart with a robust framework to continuously integrate data and improve their operations according to business needs. This case study gives clear-cut information about how Walmart efficiently utilizes big data.

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