

Practical 1

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AIM: Study and analyze various use cases of Big Data in diverse industries.

- Big Data in Retail
- Big Data in Healthcare
- Big Data in Education
- Big Data in E-commerce
- Big Data in Media and Entertainment
- Big Data in Finance
- Big Data in Travel Industry
- Big Data in Telecom
- Big Data in Automobile

What is Big Data?

Big data, by definition, comprises tremendous amounts of information that flow in from a multitude of sources, such as social media, online transactions, researches, and many other things. This data is either structured, semi-structured, or unstructured and, therefore, characterized by its high velocity, volume, and variety which have been termed 'the 3 Vs'.

By analyzing Big Data, advanced analytics combined with machine learning algorithms will discover hidden patterns or insights that may not be seen before. Proper analysis can determine important decisions to the fullest to optimize operations and be competitive in general sectors of today's digital world. Big Data is immense and actually one of the most important assets that organizations want to garner for data-driven strategies of organizations today.

Use Cases Big Data in E-Commerce Industry

Big Data provides a great deal of benefits for brands and retailers in terms of cost reduction, increased effectiveness, competitive pricing, innovating, analyzing the local market, and managing their reputation online. Big Data supports very well informed decision-making and allows them to create product- and service-specific offerings. It creates innovation because it allows pulling valuable insights from the data. It may help monitor market trends, update strategies along the way, and basically, enhance their reputation online, which is of great importance in shaping how brands perceive them.

Big Data & E-commerce

Customer Insight

Inventory Control

- Price Control
- Customer Support
- Product Management
- Competitor Analysis
- Marketing & Advertising
- Tracking & Measurement

Unleashing Customer Insights from E-commerce Data

E-commerce data is a treasure trove of information regarding customer behavior, preferences, and purchase habits. Without delving in deep, it can help deliver super valuable insights for driving growth and boosting customer satisfaction .

Primary Areas in Customer Insights

The following are some primary areas to focus on while analyzing your e-commerce dataset:

Customer Segmentation

The analysis of demographic data categorized by the age, gender, location, income, and so on segments varied customer types. Behavioral segmentation: Customers are segmented based on their specific purchasing behavior, browsing patterns, and levels of engagement. RFM segmentation: Segmentation of customers based on variables such as Recency (how recently they have purchased), Frequency (how regularly they purchase), and Monetary Value (amount spent). Customer Lifetime Value (CLTV)

Average Revenue Per User: Calculate the lifetime potential of revenue to be extracted from a customer.

Segment high-value customers and pursue specific marketing activity.

Customer Acquisition and Retention: Analyze the various channels through which customers are acquired and evaluate which of them is most successful.

Identify factors that lead to successful retention versus churn.

Product Performance: Analyze sales, acceptance, and reviews from customers regarding the same product by understanding your best-sellers and ways of improving your product.

Understand the cross-selling and upselling opportunities available on the particular product.

Customer Behavior Analysis

Analyze customer browsing patterns, cart abandonment rates, and purchase journeys to optimize the website and checkout processIdentify customer preferences and trends to inform product development and marketing strategiesCustomer SatisfactionAnalyze customer feedback, ratings, and reviews to measure satisfaction levelsImprove areas of customer service and product qualityData Analysis TechniquesTo draw valid conclusions from your e-commerce dataset, you might use the following techniques:

Descriptive Statistics: Summary statistics include mean, median, mode, standard deviation, among others, in order to understand basic characteristics of the data.

Data Visualization: Create plots, graphs, and dashboards to visualize patterns and trends in the data.

Correlation Analysis: Identify relationships between the variables in order to understand how various factors impact the behavior of customers.

Customer Segmentation: Customer segmentation groups customers into homogeneous groups based on similar characteristics so that there is targeting of marketing efforts.

Predictive Modeling: Build models that forecast what a customer will do next, like the chance of a purchase or the possibility of a customer abandoning.

Tools and Technologies

You will find the following tools and technologies helpful in your e-commerce data analysis:

Data Analysis Software: Excel, Python (Pandas, NumPy, Scikit-learn), R, SPSS

Data Visualization Tools: Tableau, Power BI, Python (Matplotlib, Seaborn)

Customer Relationship Management (CRM) Systems: Salesforce, HubSpot

Web Analytics Tools: Google Analytics, Adobe Analytics

Example Insights

Some examples of insights you can uncover in your e-commerce dataset:

Identify High-value customers: You can know the customers bringing the most revenue by using CLTV and target retention efforts to those customers.

Optimization of product recommendation: Analysis of purchase history can help recommend products to customers for suitable sales.

Ease of website: The analysis of user behavior can be helpful in identifying pain points at the checkout phase and optimizing the website for conversion.

Personalized marketing campaigns: Customer segmentation on the basis of demographic and behavioral information will lead to more targeted campaigns where more people are engaged with the advertisement.

Source

<https://blog.lengow.com/price-intelligence/big-data-in-e-commerce-explanation-and-use-cases/>

Dataset

<https://www.kaggle.com/datasets/uom190346a/e-commerce-customer-behavior-dataset/data>

<https://drive.google.com/file/d/154J-neBo20ABtSmJDvm7DK0eTuieAuvw/view>

<https://github.com/suu990901/Dial-MAE>

<https://www.kaggle.com/datasets/mervemenekse/ecommerce-dataset/data>

<https://data.mendeley.com/datasets/ggbkd8ck3x/1>

<https://www.kaggle.com/code/mahmoudosama10/customer-behaviour-analysis>