

Trends and applications in Data Science

Unit VI

Syllabus

- Data Science: applications and case studies
- Data science for
 - text,
 - image,
 - video,
 - audio.
- Data science for Multimodal applications.
- Self-learning Topics: ImageNet Large Scale Visual Recognition Challenge (ILSVRC).

E-commerce

- **A.** Whenever we search for any product over the internet, it starts giving us suggestions about some similar products. The companies are using Data Science for **promoting** their products according to the user's interest through the **recommendation** system. These suggestions are mostly based on the users' previous search history.
- **B.** Customers' **sentiment analysis** enables the company to **predict** the **reviews of the users** on their products.
- **C.** Data Science is also used to **calculate the right price** of the products by considering the different **market trends, user response, etc.**

Data Science in Healthcare

- **A. To predict** the effect of the disease and the treatment on the patient. It can be helpful in predicting the pattern of **evolution**, of the disease and reducing **risks** and undesired outcomes accordingly.
- **B. Genomics – Treatment Personalization (personalized medicine)** By gaining insights about the patient's genetic structures and genomics, the Doctor can have a better understanding of what will be the best treatment or choose a **prevention** plan that is right.
- **C. Medical Image Analysis** :can make a considerable change in any patient's treatments, by analysing tests like **X-ray, Magnetic Resonance Imaging** abbreviated as **MRI, computed tomography**, can help Doctors to better understand the problem.
- **D. Drug Discovery**: The journey of a drug from research to making it available in the market involves an average expenditure of **2.6 billion dollars** and more than **10 years** of time. Data Science helps us to get the early insights into the drugs easily.

Energy Industries

- **Data Science** can help the Energy industry to discover new energy sources, increase efficiency and productivity. It removes the gap between the supply and demand, provides better maintenance, effective safety measures for the public by proper observation, effective resource utilization
- **For example**, if the Electricity provider gets the information about the high winds and stormy weather in advance then they can minimize the effects by taking some preventive measures such as trimming the trees nearby the power line more frequently than the usual.

Data Science in Travel Industry

- The Industries are using Data Science for providing **personalized** services by dividing the people into different groups based on their interests and preferences
- **Customer Sentiment Analysis** also plays a significant role in the Travel Industry as well. Various Machine Learning algorithms are applied to textual data from different social networking platforms
- Data Science is used to provide the optimal **travel costs, time schedule, and route** for the customers.

Finance

- The aim is to analyze a large amount of data available in the market to predict the behavior of the market in the near future.
- Another area of Data Science application is Fraud Detection
- The various Financial companies have realized, that to stand out in the market they need to maintain personalized relations with their customers

Gaming

- Data Science plays a very important role in the entire **development** of a game. It helps in gaining insights from the data to design the games in such a way that it keeps the players engaged.
- Game Monetization is another Data Science application. The development of most of the popular games involves a lot of **time** and **money**.
- Visual effects and graphics play a very important role in gaming. Data Science is used to enhance the visual quality of the games. Attractive **visuals** and **graphics** in the game engage people more effectively.

Data Science Case Study

- **Transport for London** –In London, there is an organization named **Transport For London (TFL)** that looks after the connectivity of trains, cars, and other means of transport.
- **American Cancer Society** in 2017 states that nearly 1.7 million people in the US were expected to be diagnosed with Cancer. Over 600 thousand people died because of Cancer, that is, 1650 per day.

1. Hospitality

- Airbnb focuses on growth by analyzing customer voice using data science
- Qantas uses predictive analytics to mitigate losses

2. Healthcare

- Novo Nordisk is Driving innovation with NLP
- AstraZeneca harnesses data for innovation in medicine

3. Covid 19

- Johnson and Johnson uses data science to fight the Pandemic

4. Ecommerce

- Amazon uses data science to personalize shopping experiences and improve customer satisfaction

5. Supply chain management

- UPS optimizes supply chain with big data analytics

6. Meteorology

- IMD leveraged data science to achieve a record 1.2m evacuation before cyclone "Fani"

7. Entertainment Industry

- Netflix uses data science to personalize the content and improve recommendations
- Spotify uses big data to deliver a rich user experience for online music streaming

8. Banking and Finance

- HDFC utilizes Big Data Analytics to increase income and enhance the banking experience

- 10 Most Interesting Data Science Case Studies with Examples
 - Data Science Case Studies in Retail
 - Data Science Case Studies in Entertainment Industry
 - Data Science Case Studies in Travel Industry
 - Data Science Case Studies in Social Media
 - Data Science Case Studies in Healthcare
 - Data Science Case Studies in Oil and Gas

- 1. Data Science in Pharmaceutical Industries
- Predictive Modeling for Maintaining Oil and Gas Supply
- Data Science in BioTech
- Data Science in Education

- Case Study 1: [Text Emotions Detection](#)
- Case Study 2: [Hotel Recommendation System](#)
- Case Study 3: [Customer Personality Analysis](#)
- Case Study 4: [Spotify's "This Is" Playlists: The Ultimate Song Analysis For 50 Mainstream Artists](#)

- <https://techvidvan.com/tutorials/data-science-applications/>
- <https://www.knowledgehut.com/blog/data-science/top-data-science-case-studies>
- <https://www.projectpro.io/article/data-science-case-studies-projects-with-examples-and-solutions/519>
- <https://data-flair.training/blogs/data-science-case-studies/>
- <https://medium.com/analytics-vidhya/data-science-case-studies-solved-and-explained-7b077dc24531>
- <https://www.edureka.co/blog/data-science-applications/>