



# SNS COLLEGE OF ENGINEERING

Kurumbapalayam (po), Coimbatore – 641 107

Accredited by NAAC-UGC with 'A' Grade

Approved by AICTE & Affiliated to Anna University, Chennai

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

## 19AD504 – DATA VISUALIZATION

### UNIT –I

#### INTRODUCTION TO DATA VISUALIZATION

#### 1.2 NEED OF VISUALIZATION

Data visualization plays a crucial role in various domains and scenarios. Here are some common situations where the need for visualization arises:

**1. Data exploration and analysis :**

- When working with large and complex datasets, visualization helps in understanding the underlying patterns, trends, and relationships. It allows you to spot outliers, identify correlations, and gain insights into the data.

**2. Business and marketing analytics :**

- Visualization is used to analyze sales data, customer behavior, market trends, and other business metrics. Visualizing these data helps in making informed decisions, identifying growth opportunities, and monitoring key performance indicators (KPIs).

**3. Scientific research :**

- Scientists and researchers often use visualization to represent experimental results, simulations, or statistical findings. It enables them to communicate their findings effectively, discover new patterns, and facilitate collaboration among peers.

**4. Financial analysis :**

- Visualization is valuable in finance and investment analysis. It helps in visualizing stock market data, portfolio performance, financial indicators, and risk assessment. Visual representations make it easier to spot trends, patterns, and potential investment opportunities.

**5. Geographic data analysis :**

- Maps and geospatial visualizations are used to represent data related to locations, demographics, climate, transportation, and more. Geographic visualizations aid in understanding spatial patterns, making informed



decisions about resource allocation, and planning for infrastructure development.

#### 6. **Dashboard and reporting :**

- Visualizations are essential components of interactive dashboards and reports. They provide a snapshot of key metrics and allow users to explore data, drill down into details, and track progress towards goals.

#### 7. **Social media and sentiment analysis :**

- Visualizations help analyze social media data, sentiment trends, and customer feedback. They provide insights into public opinion, sentiment patterns, and brand perception.

#### 8. **Health and healthcare :**

- Visualization is employed in medical research, patient data analysis, and healthcare management. It assists in understanding disease patterns, visualizing patient demographics, tracking treatment outcomes, and identifying public health trends.

#### 9. **Internet of Things (IoT) :**

- With the proliferation of IoT devices and sensors, visualizations are used to represent real-time data streams and monitor connected systems. They enable monitoring and control of devices, visualizing sensor data, and identifying anomalies.

#### 10. **Educational and instructional purposes :**

- Visualization is used in educational settings to simplify complex concepts, explain scientific phenomena, and aid in learning. Visual representations enhance understanding and engagement among students.

## Benefits of Data visualization

