SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution
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DEPARTMENT OF MECHATRONICS ENGINEERING

UNIT 1 – INTRODUCTION TO BIG DATA

BIG DATA USE CASES

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Big data is applied across various industries and sectors to derive insights, optimize processes, and make informed decisions. Here are some notable use cases of big data across different domains:

Healthcare:

- **Predictive Analytics for Patient Care:** Analyzing large healthcare datasets allows for predicting disease outbreaks, identifying at-risk patients, and optimizing treatment plans.
- **Clinical Research and Drug Development:** Big data is used to analyze vast datasets from clinical trials, genomic research, and patient records to accelerate drug discovery and development.

Finance:

- **Fraud Detection:** Big data analytics helps financial institutions detect unusual patterns and anomalies in transactions, enabling early identification of potential fraud.
- **Algorithmic Trading:** Financial firms use big data to analyze market trends, news, and social media data for making real-time trading decisions.

Retail:

- **Customer Segmentation and Targeted Marketing:** Big data is used to analyze customer behavior, preferences, and purchase history to create personalized marketing campaigns and enhance customer experience.
- **Inventory Management:** Retailers use big data analytics to optimize inventory levels, reduce stockouts, and improve supply chain efficiency.

BIG DATA USE CASES

Telecommunications:

- **Network Optimization:** Big data helps telecom companies analyze network performance data, predict outages, and optimize network capacity to improve service quality.
- **Customer Churn Prediction:** Analyzing customer data allows telecom providers to predict and reduce customer churn by offering targeted retention strategies.

Manufacturing:

- **Predictive Maintenance:** Big data is employed to analyze sensor data from machinery to predict when equipment is likely to fail, enabling proactive maintenance and minimizing downtime.
- **Supply Chain Optimization:** Manufacturers use big data to optimize supply chain processes, improve logistics, and reduce costs.

Transportation and Logistics:

- **Route Optimization:** Big data analytics helps optimize transportation routes, reduce fuel consumption, and improve overall logistics efficiency.
- **Predictive Maintenance for Vehicles:** Analyzing data from vehicle sensors helps predict and prevent maintenance issues, ensuring fleet reliability.

Energy:

- **Smart Grid Management:** Big data is used to analyze data from smart grids, optimizing energy distribution, and improving grid reliability.
- **Energy Consumption Forecasting:** Utilities use big data analytics to forecast energy demand, allowing for better resource planning and allocation.