Data Acquisition & Data Collection Methods
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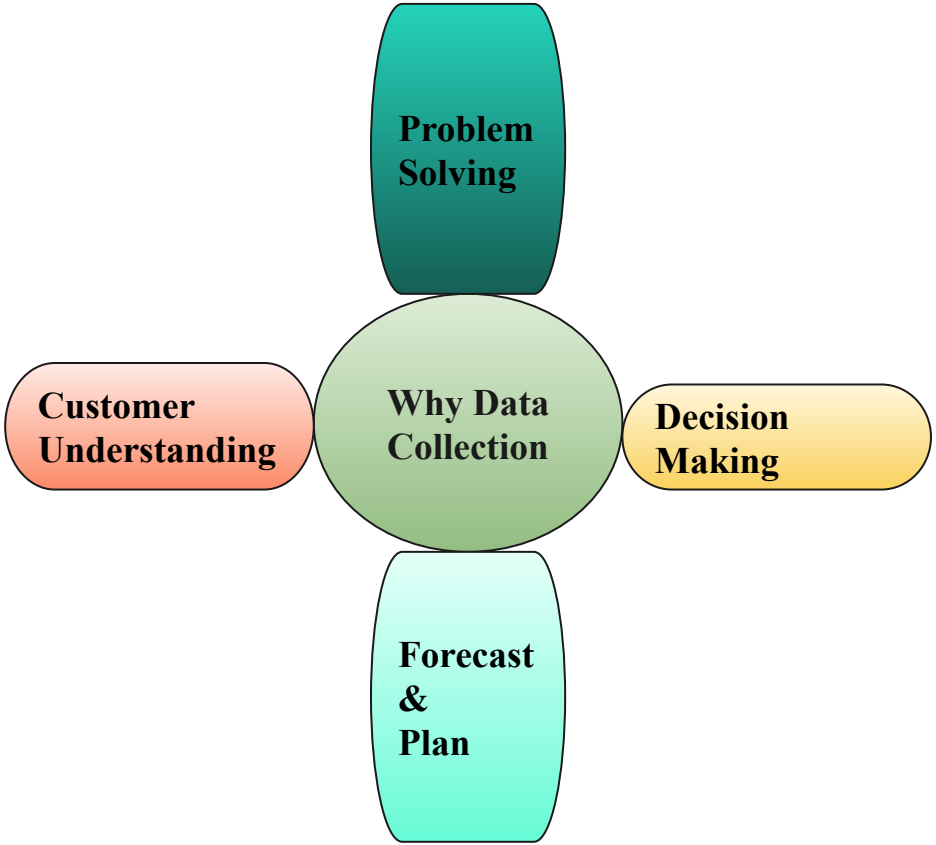
What is Data Acquistion/ Data Collection?

- Gathering data from various raw sources
- digitized and stored for further analysis and interpretation.

- Data Sources:
  - Sensors, Instruments
  - IOT Devices
  - Business Workflows
  - Self Driving Cars

Necessity For Data Collection?



Data Collection Methods

- Sensor Based Methods
- Manual Data Collection
- Mobile Data Collection
- Web Scraping
- APIS
- Remote Sensing
- Automated Data Logger

Data Collection Methods: Sensor Based Data Collection

- GPS Sensors for tracking vehicle location & speed
- Lidar and Camera sensors in self driving cars
- Leaf Wetness Sensors for detecting plant diseases
- Soil moisture sensors to measure soil water content.
- Digital watch for tracking sleeping patterns.
- Accelerometer to track physical movement and daily walk steps.
- Heart Rate Monitors to monitor pulse rates and heart rhythm.
- Weather forecasting temperature sensor, barometric sensor, humidity sensors, rain gauge, anemometers to detect windspeed and direction.

Data Collection Methods: Manual & Mobile Data Collection

- Manual data collection: Involves human operators recording data through observation, surveys, or interviews (Population Census)

- Mobile data collection: Using mobile devices such as smartphones or tablets to gather data in the field through specialized apps or forms.

Data Collection Methods: Web Scraping & APIS

- Scraping stock data for stock market analysis using daily and real time market movements, utilizing weather apis to retrieve current weather conditions, forecasts, and historical weather data.

Data Collection Methods: Remote Sensing

- Gathering data from a distance using devices such as satellites, drones, or remote cameras.
- Satellite Imagery For Natural Resource Management
- Using Drones For Crop Monitoring & precision.

Where can we store Collected Data?

- **Cloud Servers**
- **Physical Location Servers**
- **Relational Databases**
- **NoSQL Databases**
- **Data Warehouse** (Amazon Redshift, Google BigQuery, Snowflake)
- **Data Lakes** (Amazon S3, Google Cloud Storage, and Azure Data Lake Storage)

Guidelines For Data Collection

Purpose & Scope

Data Security & Ethics

Ensure Data Quality

Informed Consent

Importance of Data Acquisition Systems

- Accurate Data Collection
- Real-Time Monitoring
- Foundation For Analysis
- Innovation & Research

References

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THANK YOU