



Data analytics

Lecture 2

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Objectives

- **To understand different types of data and data analytics**



Type of Data



❑ One of the reasons why business intelligent and analytics is so complex concerns the sheer myriad of data and data sources that are available.

■ Different types of data

- **Master Data**
- **Transactional data**
- **External data**
- **Open data**
- **Big data**
- **Structured and Unstructured data**
- **Metadata**



Type of Data

➤ Master Data

- **Master Data** encompasses core data entities used by organizations for business operations, shared across departments and systems.
- **Examples of Master Data** include customer data, product data, supplier data, and employee data.

➤ Transactional Data

- refers to the data that is generated by individual business transactions, such as sales orders, purchase orders, and invoices.
- **For example**, the purchase order number, quantity, price, and vendor information are all examples of transactional data.



Type of Data



➤ External Data

- refers to any data that is collected from sources outside of an organization.
- **Example:** like competitor prices or reviews. It helps businesses make better decisions (like adjusting prices) and improve customer satisfaction, resulting in more sales.

➤ Open Data

- Data that is freely available to the public.
- **Example** is weather information provided by meteorological agencies. This data includes forecasts and, temperature readings etc.



Type of Data



➤ **Big Data** refers to large volumes of structured, semi-structured, or unstructured data that inundates a business on a day-to-day basis.

■ Characteristics of Big Data

1. **Volume**: refers to the large amount of data generated,
2. **Variety**: refers to the diverse types of data, including structured, unstructured, and semi-structured data,
3. **Velocity**. refers to the speed at which the data is generated and needs to be processed in real-time.



Type of Data

➤ Structured data

- Organized in a predefined format like databases or spreadsheets.
- Easy to search, sort, and analyze.
- Commonly used in applications such as financial transactions.
- Examples: names, addresses, phone numbers, product descriptions

➤ Unstructured data

- Lacks a predefined structure or format.
- Difficult to organize or analyze using traditional methods.
- Includes various data types like text, images, audio, and video files.
- Examples: social media posts, emails, customer reviews, IoT sensor data.



Type of Data



➤ Semi-structured data

- refers to data that has some organization or structure,
- but does not follow a strict and predefined format like structured data.
- **An example** of semi-structured data is XML (eXtensible Markup Language) documents used to store information like configuration files or data exchange between different systems.

➤ Metadata

- information about information. It's like a label attached to something, telling you more about it.
- **Example:** A photo's metadata might include the date it was taken, the camera used, and the location.
- Helps organize and find information easily. Imagine searching for photos based on location or date!



Data Analytics



❑ **Data analytics** the scientific process of collecting, cleaning, transforming, analyzing, and interpreting data to extract meaningful insights and inform decision-making.

❑ **Types of data analytics:**

- **Descriptive:** Summarizes data to paint a picture of what happened.
- **Diagnostic:** Digs deeper to understand why something happened.
- **Predictive:** Uses historical data to predict future outcomes.
- **Prescriptive:** Recommends actions to achieve specific goals based on data insights.



Fraud Analytics



- **Fraud analytics** involves using data analysis techniques to identify and prevent fraudulent activities.
- It utilizes advanced analytics, statistical modeling, machine learning, and data mining techniques.
- fraud analytics can help organizations detect and prevent fraud in real-time.
- **Examples of fraud analytics** include transaction monitoring for credit card fraud, and social media monitoring to detect fake accounts and suspicious activities.



Marketing Analytics



- Marketing analytics involves analyzing data from **various channels** to measure performance and optimize strategies.
- **Data Sources:** Website analytics, social media insights, CRM systems, advertising platforms, market research, customer feedback.
- **An example** of marketing analysis is analyzing the sales data of a retail store to identify the best-selling products, the busiest times of day or year.



HR Analytics



➤ **HR Analytics** involves using data analysis techniques to gain insights into various HR-related activities, such as recruitment, employee engagement, and workforce planning.

○ **Example:**

- **Analysis:** Company finds remote employees more productive & engaged than office workers.
- **Action:** Expands remote work opportunities.
- **Outcome:** Increased productivity & employee satisfaction.



Text Analytics



- **Text analytics** involves analyzing unstructured text data to derive insights, patterns, and trends.
- Techniques include text mining, natural language processing (NLP), sentiment analysis, and topic modeling.
- Applications include customer feedback analysis, social media monitoring, and content recommendation.
- **Example:** A company uses text analytics to analyze customer reviews of their products on various online platforms.



End session questions



1. What are the key distinctions between Master Data and Transactional Data within organizational information management systems, and could you provide examples of each type to illustrate their respective roles in business operations?
2. How does marketing analytics leverage data from diverse sources such as website analytics, social media insights, CRM systems, advertising platforms, market research, and customer feedback to measure performance and refine strategies? Could you provide an example of marketing analysis that illustrates this process, perhaps involving the examination of sales data from a retail store?