Data Analytics

Lesson 03.

Visualizing and Exploring data

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Scholar: https://scholar.google.com/citations?user=kHZvlTkAAAAJ&hl=en&oi=ao

Co-Founder: XAI - https://xai.foo/

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Learning materials

- Textbook
  - Evans, J. (2016) Business Analytics. 2nd edn. Pearson.
  - Runkler, T. (2016) Data Analytics: Models and Algorithms for Intelligent Data Analysis. 2nd edn. Vieweg+Teubner Verlag.

- Online reference materials
  - archive.ics.uci.edu/ml/
  - powerbi.microsoft.com
  - https://github.com/topics/data-analysis-python
  - https://media.pearsoncmg.com/ph/esm/esm_evans_eba3e_20/tools/eba3e_analytic_solver.html
  - https://data.imf.org/

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Agenda

- Lesson 1: Understanding Data Analytics Terminologies.
- Lesson 2: Foundation of Business Analytics
- Lesson 3: Visualizing and Exploring data
- Lesson 4: Applying Descriptive Analytic Techniques
- Lesson 5: Data Modeling
- Lesson 6: Predictive Analytics
- Lesson 7: Regression, Classification and Clustering
- Lesson 8: Forecasting Techniques
- Lesson 9: Investigating Predictive Analytic Techniques
- Lesson 10: Introduction to Data Mining
- Lesson 11: Demonstrating Prescriptive Analytic Methods
- Lesson 12: Recap and advanced topics

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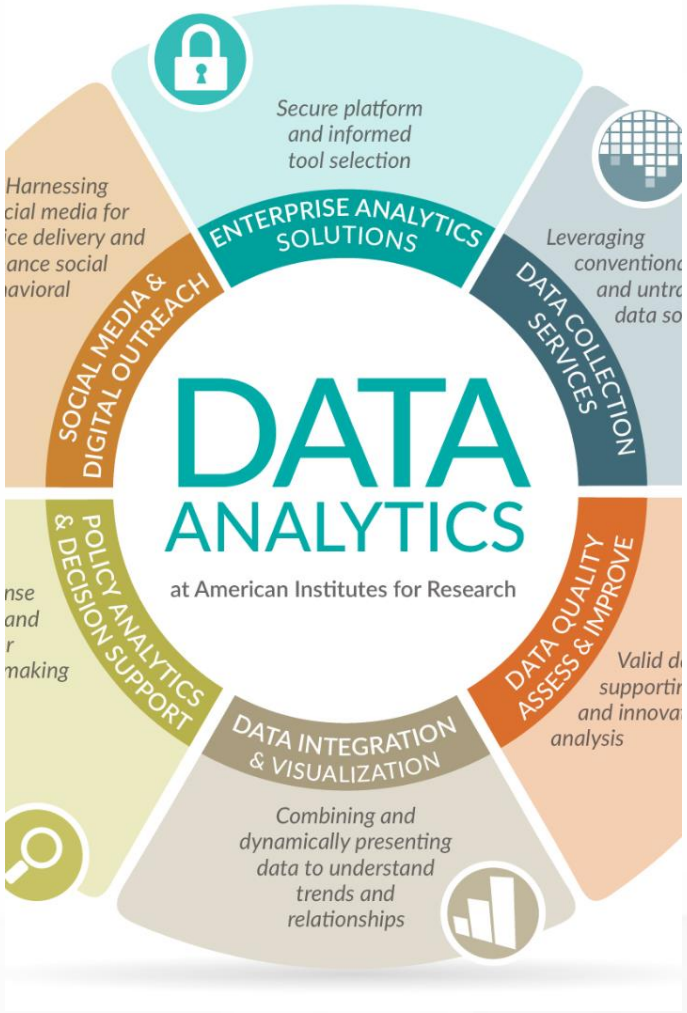
Applying Descriptive Analytic Techniques



Unlock the power of data through descriptive analytics. Discover the importance, types, benefits, and challenges of applying these techniques.

Importance of Descriptive Analytics

1. **Business Insights**

   Understand past trends and patterns to make informed decisions and drive future success.

2. **Performance Evaluation**

   Evaluate the effectiveness and efficiency of processes to identify areas for improvement.

3. **Competitive Advantage**

   Gain a competitive edge by uncovering valuable insights hidden within your data.

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Applying Descriptive Analytic Techniques

Types of Descriptive Analytics Techniques

Summary Statistics

Measure central tendency, dispersion, and shape of data distributions to summarize and interpret data.

Data Visualization

Transform complex data into intuitive visuals, making it easier to identify trends, outliers, and patterns.

Data Exploration

Interact with data through exploration and discovery techniques such as clustering, classification, and association analysis.

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Applying Descriptive Analytic Techniques

Benefits of Applying Descriptive Analytics

Improved Data Understanding

Gain a deeper understanding of your data, its quality, and its relevance to your business.

Identification of Patterns and Trends

Uncover valuable insights, patterns, and trends that can drive strategic decision-making.

Data-Driven Decision Making

Make informed decisions backed by data and reduce reliance on intuition or gut feeling.

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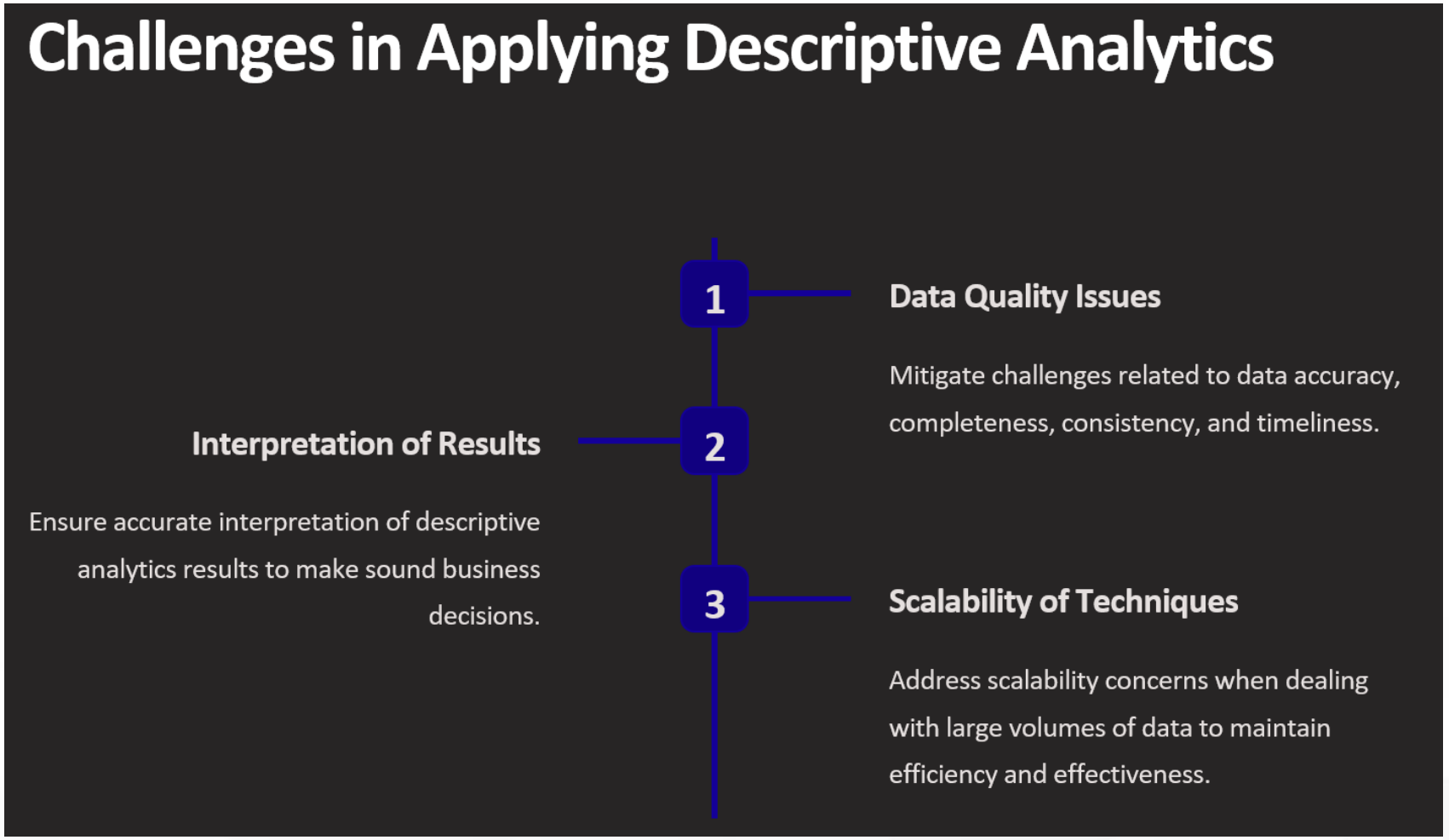
Applying Descriptive Analytic Techniques



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Applying Descriptive Analytic Techniques

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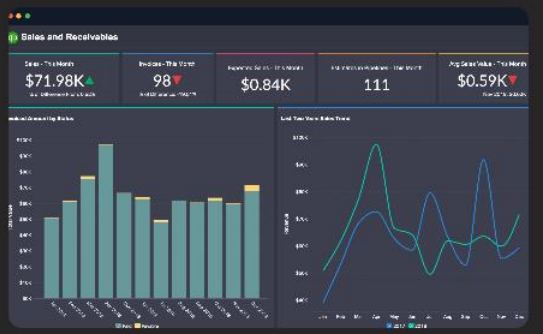
Case Studies of Descriptive Analytic Techniques in Action

Retail Industry

Discover how descriptive analytics helps retailers optimize inventory, understand customer behavior, and improve sales.

Healthcare Industry

Explore how descriptive analytics enhances patient care, improves resource allocation, and detects potential epidemics.



Financial Industry

Learn how descriptive analytics enables financial institutions to detect fraud, manage risk, and improve customer service.

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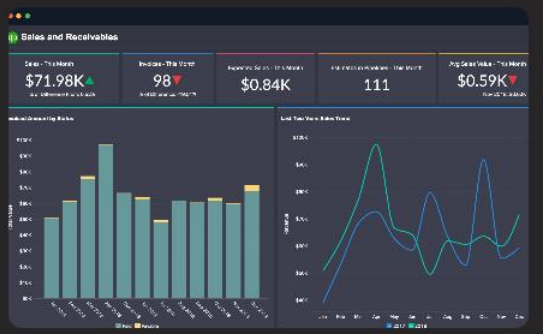

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Google classroom task

- Find a short YouTube video (less than 6 mins) talking about Descriptive Data Analytics.
  - Watch and investigate.
  - Submit your answer:
    - YouTube Link
    - List down 10 keywords
    - Summary text with your comments..

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Applying Descriptive Analytic Techniques

1. Descriptive analytics primarily focuses on _____. a) Predicting future outcomes b) Understanding historical data c) Prescribing optimal decisions d) Simulating complex scenarios
2. The main goal of descriptive statistics is to _____. a) Make predictions about the future b) Summarize and describe data c) Prescribe specific actions d) Create machine learning models
3. Histograms, pie charts, and bar graphs are examples of _____ used in descriptive analytics. a) Predictive models b) Visualizations c) Machine learning algorithms d) Hypothesis tests
4. Descriptive analytics helps organizations to _____. a) Forecast future trends b) Understand past performance c) Prescribe optimal strategies d) Ignore historical data
5. In descriptive analytics, measures of central tendency, such as mean, median, and mode, are used to _____. a) Predict future outcomes b) Summarize the spread of data c) Prescribe specific actions d) Understand the average behavior

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Learning Mission

30 mins

Reading Business Analytics textbook: Chapter 4, page 95 – 130.

Discussion and answer:

Make a brief side glossary table using terms below:

1. Correlation
2. Population
3. Sample
4. Standard deviation
5. Standardized value (*z*-score)
6. Outlier
7. Statistical thinking Unimodal
8. Variance

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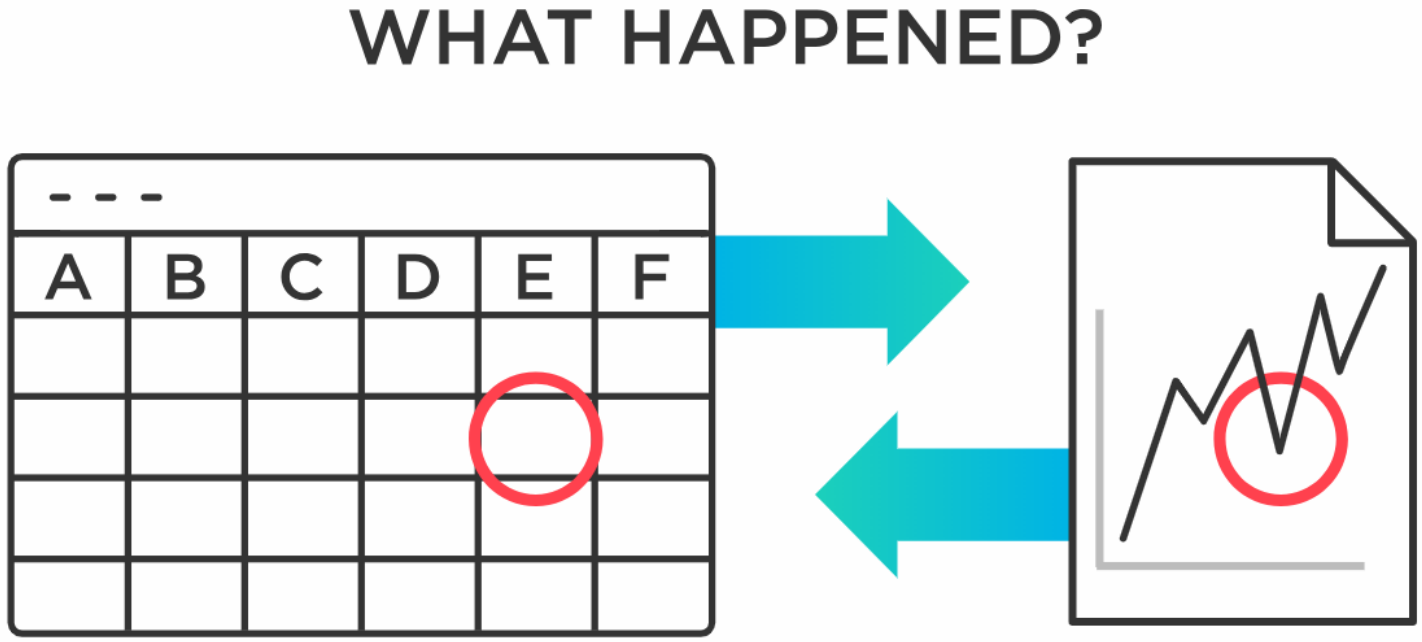
Applying Descriptive Analytic Techniques

- Self Practice:
- A practical and hands-on idea for business students to self-practice Descriptive Data Analytics is to engage in a real-world data analysis project. This project could involve the following steps:
- **1. Identify a Dataset:**
- **2. Clean and Preprocess Data:**
- **3. Explore Descriptive Statistics:** Have students calculate and interpret descriptive statistics for key variables in their dataset. This could include measures of central tendency (mean, median, mode), measures of variability (range, variance, standard deviation), and other relevant statistical metrics.
- **4. Create Visualizations:** Encourage students to create meaningful visualizations using tools like Excie, Excel, Python, Word Cloud, or Google Data Studio.
- **5. Draw Insights and Conclusions:**
- **6. Present Findings:** Finally, have students prepare a brief presentation or report summarizing their findings. This could involve showcasing key visualizations, discussing challenges encountered during data cleaning, and presenting the business implications of their descriptive analytics.

Conclusion and Questions

- Applying Descriptive Analytic Techniques

- By leveraging descriptive statistics, visualizations, and other tools, we can effectively communicate complex information in a comprehensible manner, facilitating better-informed decision-making at various levels within an organization. The ability to succinctly describe and summarize data not only aids in identifying areas of strength and improvement but also enhances communication among stakeholders.



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Thank you