FOUNDATIONS OF DATA ANALYTICS (CSE3505)

Dr. Trilok Nath Pandey

Vellore Institute of Technology
SCOPE VIT, Chennai

triloknath.pandey@vit.ac.in

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Text Books

Trevor Hastie & Rob Tibshirani

An Introduction to Statistical Learning with Applications in R

Springer, 2017

Mark van der Loo & Edwin de Jonge

Learning R Studio for R Statistical Computing

Packt Publishing, 2012.

Jure Leskovek, Anand Rajaraman & Jeffrey Ullman

Mining of Massive Datasets

Cambridge University Press. 2014

Course Overview

- **Module-1: Introduction to Analytics**
  Analytics life cycle - Business Analytics - Lending Analytics- Recommendation Analytics- Healthcare Analytics- Financial Analytics - Sports Analytics.

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- **Module-3: Working with datasets and files**
  Reading Datasets, Working with different file types .txt,.csv , R studio,Files, Datasets, Extracting Datasets, Preparing datasets. Data Cleaning,Data imputation, Data conversion Analysis.

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  Data Analytics is the science of extracting trends, patterns, and relevant information from raw data to draw conclusions.

Data Analytics: Benefits

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Cost Reduction

Effective decision making

Improved efficiency

Good resource utilization

Good market insights

Data Analytics: Domains

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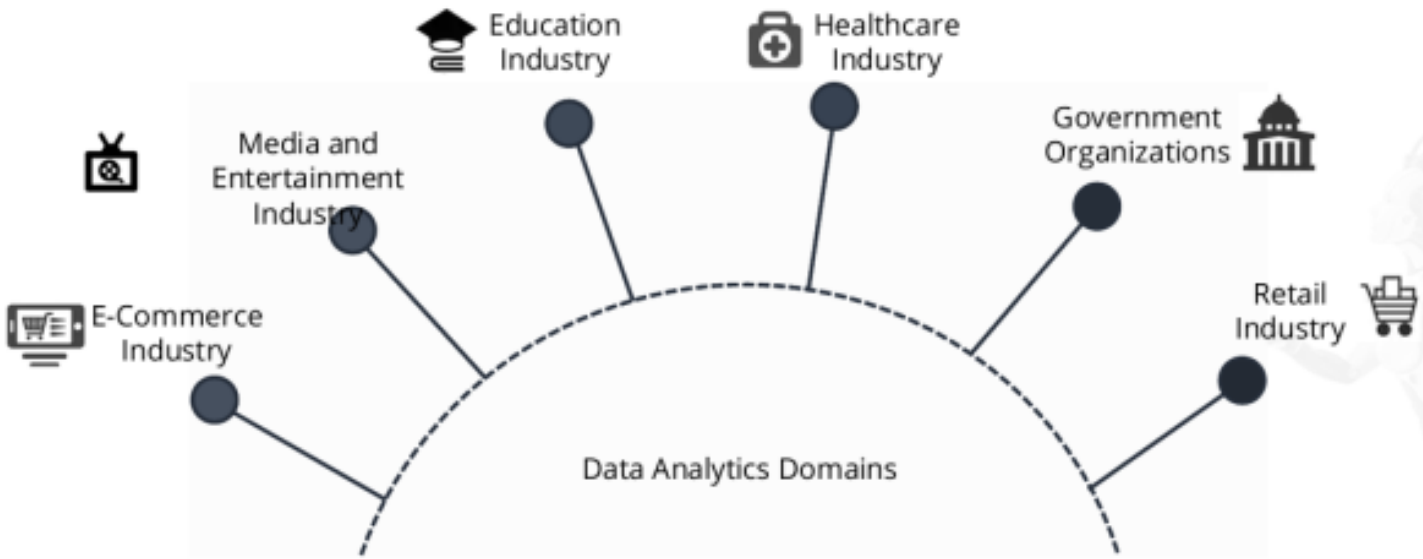

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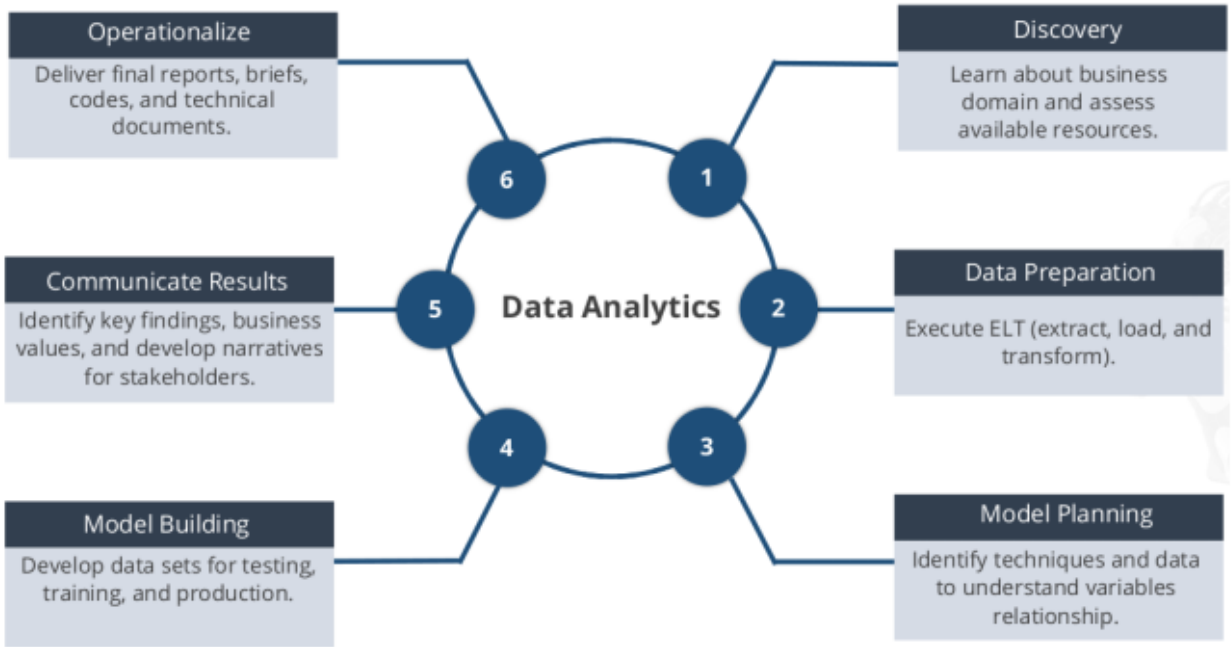

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Descriptive Analytics

- Descriptive analytics is designed to access information about the past.
- It focuses on the summarized view of facts.

- It is the conventional form of analytics.
- Its purpose is to summarize the findings.

Descriptive Analytics Techniques

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Diagnostic Analytics

- Diagnostic analytics helps you identify why something happened in the past.
- It takes a deeper look at data to understand the root cause of events.
- It has a limited ability to provide actionable insights.
- It provides an understanding of causal relationships and sequences.

Diagnostic Analytics Techniques

Predictive Analytics

Predictive analytics is used in:

- Predicting future outcomes in terms of probability of an event to occur
- Analyzing sentiments where all opinions posted on social media are collected to predict a person's sentiment
- Identifying target audience for a promotional campaign
- Forecasting weather, plan-failure prediction, and travel products recommender system

A predictive model is built on the preliminary descriptive analytics stage.

Predictive Analytics Tools

Machine learning algorithms such as random forests, SVM and statistics.

Trained data scientists and machine learning experts building these models

Popular tools for predictive analytics: Python, R and RapidMiner.

Prescriptive Analytics

Types of Analytics: Amazon Example

Diagnostic Analytics

- Amazon's revenue increased in the West Coast during the past one year
- Increased spending on sales training

Predictive Analytics

- Purchase factors: price, time, weather, and festive seasons
- Predicted 10–12 percent increase in revenue

Types of Analytics: Amazon Example

- Spent $20M in different sales training the previous year

- Sales trainings fetched good ROI
- Implemented a suitable optimization plan to maximize revenue

THE END