U-6 (BI).

Data Analytics -

- examining & interpreting large vol. of data to uncover valuable insights patterns, trends to make uniform business decisions.
- It involves applying statistical mathematical technique
- also involves uses of advanced tools & technique to analyze data & extract meaningful info from data

Types of DA -

1] Descriptive - focuses on summarizing & understanding historical data.
- involves basic statistical analysis
- data aggregation.
- visualization.

2] Diagonistic - aims to understand reason behind an event or result.
- analysis historic data using advanced task like data mining. observation determines factors behind certain outcome.

3] Predictive - uses historic data to make predictions & forecast future event outcomes
- Involves applying statistical modeling, ML, Data Mining.

4] Perspective - goes beyond prediction & also provides recommendation
- for actions to optimize decision making.
- continue historic data, prediction models & optimization algo. to suggest future course of actions.

Importance -

1] Informed Decision - based on factual info rather than intuition or gut
2] Improved Efficiency & Performance - help identify collection inefficiency & workflows remove business bottlenecks, steps.
3] Customer Understand.
4] Competitive Advantage.

Predictive

→ predict with confidence
- smarter decisions
- improve business outcomes

→ likelihood different samples (find)
→ calculates live transactions.
→ utilize variety of variable data
→ variability → component data
→ big basket data
→ validate findings
→ monitored → desired results
→ examples → social media analysis, weather, retail, health care & fraud detection.

Descriptive

→ gathering, organizing tabulating & depicting data.
→ relation b/w product / service.
→ model → organize a customer by their personal preferances.
→ Business Intelligence → sense of data.
communication data → this gives
→ examples → reports that provide historical insights about company
→ data visulization
↳ easier communication

Prescriptive

→ suggests course of action.
→ finding optimal solution to problem
→ what-might-happen Analysis
→ determine best course of action
→ examples → Traffic applications, Product optimization & Operational Research

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Tools for BI :-

1) Reporting & Querying - allows user for create & run reports & queries to extract of v from db eg → Power BI, Tableau.
2) Data Visulization Tools - ~~four~~ on creating attractive & interative dashboards.
eg → Tableau, PowerBI.
3) OLAP Tools - enable to discover trends data provide drill up. slice & dice capabilities eg → oracle OLAM, Microsoft cognizent.

4) Data Mining Tools - used to discover trends patterns, relationship from large dataset using clustering, eg → .

5) Data Warehouse Tools - designed to create & manage data warehouse.
eg → Oracle database, snowflake, Microsoft SQL server.
6) Predicting Analysis Tools - apply statistical model with algo
eg → Rapid, Mixer, SAS Analysis.
7) Real Time Analysis tool → eg → Apache kafka

- PowerBI - Microsoft, connects various data sources, create visualization, e/L, easier friendly UI, drag & drop. functionality, NLP queries & AI powers Q&A. features, allows collaboration, strong.

- Oracle DB - RDBMS platform by oracle serve, scalable, high performance exchanging, query optimization parallel processing, admin access monitory, recovering & backup

- Tableau - data viz (BI tool), offer drag & drop. interative dashboards & reports, no coding. aggregation facility, allows geospatial analyses. vocabulary & sharing.
- snowflake - cloud based warehouse platform, scalable, elastic, separates. storage, compute resources with security & sharing.

- Apache kafka - distributing streaming, platform, handles real time data streams, efficient collector, processing & streaming. high replication, fault tolerance

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Role of Analytical tools in BI -

1) Data exploading & Analysis 2) Decision Making & Strategy development
3) Report Generation 4) Forecasting & Data Modeling.
5) Collaboration & Strategies 7) Real time Streaming Analysis.

* WEKA - Waikato Environment for knowledge learning -
- data mining & visulization tool.
- open source.
- features → data preprocessing.
→ classification & prediction.
→ clusters
→ .
- 4 → phasevaries.
1) Explorer.
2) Simple CLI.
3) Experiment - perform
4) Knowledge flow. Drag & Drop.

- supports verities of data similar CSV, databases, ARFF. Free
- provide classification algo - KNN, Naive Bayes, SVM, Decision ~~Entropy~~ ~~Centroids~~. Random Forest.
- evolution metrics for ML models includes feature selection tech
- offers ensemble learning.
- large collection of 3rd party extension.
- comprehensive suite of tools & algo for preprocessing classif", regression, feature sel", association rules.

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* BI appl^n in CRM -
- engage with customer effective.
- customer segmentation
- sales & revenue analysis.
- customer satisfaction & sentiment analysis
- Real time Insights
- sales forecast
- campaign effectiveness analysis

* BI appl^n in Marketing
- Market Analysis
- Customer Segmentation.
- Campaign Performance Analysis.
- Customa Retrieval
- Brand Management.
- Reporting & visualization.
- competitive Analysis.

* Logistic & Production
- supply chain optimization + Visualiz^n.
- Inventory Management.
- Quality Comp
- Defect Analysis.
- Predictive Analysis
- Performance Metrics Measurement.

* Finance.
- Reporting & Analysis
- Budgeting & forecasting
- Financial planning.
- Performance Benchmarking.
- compliance & Regulating reporting.
- Cost analysis & control.
- Invest appraising.

* Banking
- Customer Analysis
- Fraud Detection & Prevention.
- Risk Mgmt
- Loan Planning & Marking
- Competitive Analysis.
- Performance Measure
- Reporting.

* Telecommunication
- Network Performance
- Customer Mgmt & Analysis.
- Product of Service Analysis.
- Fraud detection security
- Market Analysis
- Network & Experiment & Planning
- Sales of Marketing.

* Salesforce Mgmt -
- sales performance Monitoring analysis.
- Customer Analysis
- Forecasting
- Sales Territory Planning - Potential, customer, sales target.
- Campaign Analysis
- Demand Planning
- Sales Pipeline Mgmt.

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Appln → 1) Retail
- customer history, trends, recommendation optimizes inventory mgmt, screen forecast.

2) Healthcare -
identify disease pattern, improve treatment. research & innovation improve patient care.

3) Financial sectors.
- detect fraudulent activities assess credit risk, identify investment opportunity, liquidity supply.

4) Manufacturing: optimize supply chain, monitor equipment, anomaly detection & correction, reduce downtime, prod quality

* Business Analytics -
- employ data analytics & statistical techniques & tools to gain insights to make data driven decisions & improve business performance.
- involves collecting, processing & analyzing data to uncover patterns trends that can be used to drive strategic & operational decision making.

Need → 1) Identify threats & patterns.
2) Understand company performance.
3) Find places to improve operations.
4) Promote innovation.
5) Assist in marketing strategies.
6) Customer satisfaction / retention

* ERP & BI -
- ERP (Enterprise Resource Planning) & BI are 2 different but interconnected concepts in realm of Information System & Business Mgmt.
- ERP → comprehensive software system that integrates various business process & function within org.
- serves as centralized platform for managing, automating one operations → HR, inventory mgmt, CRM, finance, accounting, etc.
→ provides unified view of orgs data, and facilities cross-functional collab.
→ It can be primarily source of data for BI initiatives.
→ BI tools can extract data from ERP, merge, transform that.

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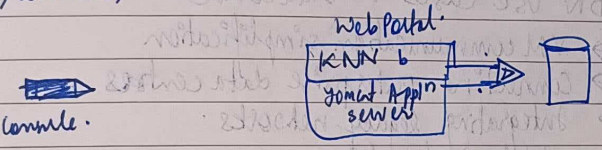
KNIME – (Konstanz Information Miner)

- open source
- integrates data mining & ML.
- written in Java.
- data formats CSX, XML, PDV, JSON supported.
- can work with unstructured data like img, document, PDF.
- Java enterprise appln + KNIME webportal with interlaced formats exist.
- allows users to create, execute, data workflows, supports workflow automation, scheduling, enterprise access control, anonymization.
- extensible, good community support, external plugins support.



Rapid Miner – supports Windo, Mac, Linux & UNIX.

- open source for text of datamining.
- provides own collection of datasets.
- can store & load data from Hadoop, NoSQL, RDBMS.

1) Rapid Miner Studio – access, load, analyze structured & unstructured data.
2) RM auto Model – solves prediction, clusters, outlier issues. provide evaluation model.
3) Turbo Prep – data preparation, gather data, consolidate, transform.
4) RPI Gro – visualize data.
5) Server – version mgmt of shared repo.

visual workflow interface, allows creation of data pipeline, supports collaboration.

R – programming layer.

- strong OOP.
- basically command line oriented but GUI available.
- open source
- cross platform compatible.
- provides large no. of commands together
- contains packages with implementation of lot of statistical & ML methods.