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**BI : Introduction :** 2030 More than 180 Zettabytes of data. How to harness the power of data? Make informed decisions.

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| A diagram of a person typing on a keyboard  Description automatically generated | A diagram of data ecosystem  Description automatically generated |
| A diagram of a company's landscape  Description automatically generated | A diagram of a diagram  Description automatically generated |
| A close-up of a chart  Description automatically generated | A diagram of a triangle with points and a flag  Description automatically generated |

BI : The ability to apprehend the interrelationships of preented facts in such a was a to guide action toward a desired goal.

BI Also can be defined of **combination of various technologies, tools and methodologies**:

* **Gather, analyzes and transform data into meaningful information**.
* Included processes like data Mining, analysis, benchmarking, Descriptive analysis, Visualization and reporting.
* Presents information into understandable and actionable items.
* BI analysis based on current data and historical data to uncover patterns, trends and relationships within data, and also to explores problems and root causes.

Overview of BI Components, Steps in the BI Process :

1. Identify sources of dat (from which to gather and extract data).
2. Determine the data warehouses or repositories where the data from different sources is stored.
3. Analyzing and making the data meaningful , such as Extract, Transform and load process (ETL process).
4. A yellow and purple diagram

   Description automatically generatedVarious reporting and presentation tools help to manipulate and present complex data into visual and understandable reports that help make business decisions.

Evolved data landscape :

1. Data analytics focus on extracting valuable information from data using various tools, techniques, processes and algorithms. Included the interpretation of the results.

* Data analytics often involve predictive modelling, hypothesis, testing and other advanced methodologies to forecast future outcomes and make data driven decisions.
* Data analytics requires depth technical skills in programming (Python / R)

1. Data science focuses on understanding the data. This involves data analysis beginning with data loading, exploring and cleaning. It creatively explores data, coming up with new olutions and inventions. Data science uses statistics, computing, machine learning, and other advanced techniques to contruct predictive systems.
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   Description automatically generatedData Engineering is concerned with designing, building, and maintaining scalable data architecture to store data. It involves developing tools, workflows and processes that collect data from multiple sources and then executing the extract, transform and load or ETL process to combine that data into a central and consistent data repository (design data pipelines for ETL) . it also encompasses implementing and maintaining distributed sytems for large scale data processing and safeguarding the privacy of and security of data.

**Requires skill in relational and non relational databases, data pipeline architecture and data modeling skills, Needs to be proficient in programming languages like Python or Java, Big data tools and frameworks, command line tools, and cöoud platforms.**

1. BI uses past and current data for analysis to inform everyday decisions that impact success. BI is like a storyteller who analyses data and reports key insights through visualization and dashboards, which influences key business decisions and strategies. BI don’t necessarily require programming skills to start off as a BI analyst. BI collect relevant data, makes it easier to comprehend and helps direct your next steps.

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1. Business intelligence reports and visualizes data to inform decisions using current and historical data. However, this is not a good choice to forecast sales accuracy. A BI analyst creates interactive reports and dashboards with actionable insights to support decision-making. They work with different departments to analyze data and transform it into clear visualizations.
2. Data engineering involves creating and maintaining the infrastructure and architecture necessary for data generation, collection, storage, and analysis
3. Data analytics involves analyzing data to extract insights for effective business decision-making
4. Data science involves using statistical and machine learning techniques to analyze complex data.

Benefits of BI :

1. Data Visualization , interactive dashboard represents data using simple interface which is accessible to each user.
2. Analysis and insights, to forecasts budgets and planning. And also helps to understand the competition and benchmark performance.
3. Speed and competitive edge, helps faster reporting , analysis, access and processing of global data.
4. Support decision making, to collect real time data to make faster and precise decisions and easy to collaboration from others team.
5. Helps to improve efficiency and productivity
6. Helps in cost saving and profitability.

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1. Analysis
2. Data vis
3. BI helps improve
4. BI process of collecting
5. Data Analyst : Gather and understand the data then analyzes and interprets it before visualizing it. Finally weaving it into a story

* Must posses strong analytical skills, proficiency in statistical analysis tools especially descriptive statistic
* Knowledge of database query languages such as SQL
* Proficient in working with spreadsheets like MS Excel and data visualization tools.

1. Data Engineer : Responsible for designing robust data architectures, building and maintaining data repositories such as data warehouse, and also design and evaluate scalable big data environments to support business with the key objective of leveraging big data for insights.

* Should be comfortable working with data repositories such as relational and NoSQL databases.
* Understanding of big data framework like Hadoop or Spark
* Be Proficient in programming languages like SQL and Python.
* Required to posses knowledge of ETL (extract transform and load) process
* Command line tools and cloud platforms.

1. BI Analyst : Analyst complex data sets and develop insights and recommendations that help make informed business decisions. Use business data to spot any trends, patterns, or possible challenges that need to be addressed. BI analysts also design and maintain data models, create reports and dashboards, and work with stakeholders to identify KPIs.
   * Proficiency in SQL and data repositories
   * Knowledge of data analysis, warehousing, visualization, and dashboard tools.
2. Data scientist : Develop algorithms, build predictive models, and uncover patterns and trends in large data sets. They apply statistical analysis, especially inferential statistics, ML and predictive modelling to extract insights from data and make predictions.

* Knowledge programming such as Python or R, data analysis and visualization techniques, and machine learning algorithms.

1. ML Engineer : Construct algorithms systems, models, and frameworks that enable machines to learn and perform functions independently and effectively. They build and maintain AI or AI software and algorithms that help automate predictive models. In addition, they help data scientists scale up their findings.

* They know about cloud technologies, infrastructure tools.
* Programming languages like Python or R, and tools for creating web services.
* Proficiency in ML and deep learning libraries, neural networks, machine learning models and algorithms.

1. Business Analyst : Bridge the gap between Business objectives and technical solutions. They identify and document business requirements, conduct feasibility studies, and propose improvements to business processes.

* BA use diagnostic, predictive, and prescriptive analytics and must have strong problem solving and project management skills, communication and presentation skills, and database querying skills.
* Posses in depth knowledge of the business and industry and proficiency in spreadsheets, presentation data visualization and reporting tools.

1. Data governance analyst : Helps a business ensure that its data is accurate, consistent and compliant with legal and regulatory requirements. They also plan and execute security measures to protect and preserve computer databases, In addition, they design strategies for enterprise databases, data warehouse systems, and multi dimensional networks.

* Proficiency in data management practices, legal requirements and communication, and presentation.
* Programming and querying skills.

<https://www.coursera.org/learn/business-intelligence-essentials/ungradedWidget/VlZQz/reading-differences-between-bi-analyst-data-analyst-data-engineer-and-data>

https://www.coursera.org/learn/business-intelligence-essentials/ungradedWidget/8ZiQz/module-1-glossary-introduction-to-business-intelligence-bi

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ROLES in BI :

1. BI analyst involves understanding and translating business need into data requirements and analysis. Collaborate with various stakeholders from various departments and communicate to define a BI project scope, objective and deliverables. BI analyst employs multiple tools and techniques for data analysis, data viualization and data storytelling to generate insights and recommendations for the business.
2. BI developer focuses on the technical aspects of BI, including developing, deploying, and maintaining BI interfaces. BI developers work closely with BI analyts and others to comprehend data requirements and offer technical assistance. They must work with data ource, data warehouses, data models, ETL Process and BI platforms . Furthermore BI developer , must translate technical language and complex information into understandable, simple, easily terms. They also create and maintain dashboards, reports and other BI applications using different programming languages. BI developers are responsible for sharing precise, secure, and accessible data with data analytics. Needs programming , front end development using java script and also SQL.
3. BI architect are responsible for designing the overall architecture of the BI System. They manage and analyze data to improve market knowledge, product performance and brand recognition. They also develop frameworks and procedures to store and interpret data. BI architect also identify the technical requirements, select the appropriate tools and technologies, ensure the scalability and performance of BI infrastructure, establish security and access controls, determine how data will flow throught the framework, and enhance data governance.

A diagram of a company

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A diagram of data scientist

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1. BI tools create a real-time dashboard for tracking the new product line’s performance, saving time and allowing easy updates.
2. Data visualization and interactive dashboards help to make informed decisions.
3. Data governance analysts help a business ensure that its data is accurate, consistent, and compliant with legal and regulatory requirements.
4. After collecting data, BI analysts clean, transform, and format it for database loading to ensure accuracy and consistency.
5. A multidimensional data model organizes data into fact and dimension tables, allowing for efficient querying and reporting with minimal redundancy.