



PRESIDENCY SCHOOL

Keynotes

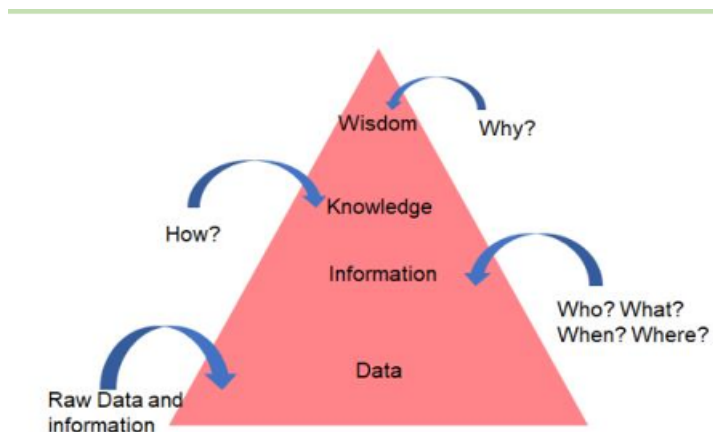
Grade: IX Subject: Artificial Intelligence Month: September Topic: Data Literacy

Data:

It is a collection of raw facts and figures

The Data Pyramid

- Data → Information → Knowledge → Wisdom



- **Example: Traffic Lights**
 - o Red, Yellow, Green = Raw data
 - o "Red means stop" = Information
 - o "Red means stop to avoid accidents" = Knowledge
 - o "Understanding traffic rules improve road safety" = Wisdom

What is Data Literacy?

- Definition: The ability to read, analyze, and communicate data effectively.
- Real-world example: Online shopping—choosing the best-rated product
- Importance: Helps in decision-making, critical thinking, and problem-solving

Data Literacy process framework





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Data Privacy & Security

- **Data Privacy:** Protecting personal information (e.g., name, passwords)
- **Data Security:** Preventing unauthorized access to data
- **Examples of risks:** Data breaches, hacking, phishing

Potential risks associated with data breaches and unauthorized access

Due to the rising amount of data in the cloud there is an increased risk of cyber threats.

Hence, we should control and protect the transfer of sensitive or personal information at every known place.

The most possible reasons why data security is more important now are:

- Cyber-attacks affect all the people
- The fast-technological changes will boom cyber attacks

Cybersecurity Best Practices

- ✓ Use strong passwords
- ✓ Enable Two-Factor Authentication (2FA)
- ✓ Only download apps from trusted sources
- ✗ Never share personal info online
- ✗ Avoid clicking on unknown links

Types of Data

- **Quantitative Data (Numbers)**
 - Examples: Test scores, temperatures, prices
- **Qualitative Data (Categories)**
 - Examples: Colors, movie genres, survey opinions

Numeric Data is further classified as:

- Continuous data is numeric data that is continuous. e.g., height, weight, temperature, voltage
- Discrete data is numeric data that contains only whole numbers and cannot be fractional e.g. the number of students in the class – it can only be a whole number, not in decimals



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Types of Data used in three domains of AI:

Computer Vision-Visual data like images and videos

Natural Language Processing-Textual data like document and pdf files

Data Science-Numeric data like tables and excel sheets

Data Acquisition/ Acquiring Data

Data Acquisition, also known as acquiring data, refers to the procedure of gathering data.

This involves searching for datasets suitable for training AI models.

The process typically comprises three key steps:

1. Data Discovery- searching for new datasets
2. Data Augmentation-adding more data to the existing data by slight change of existing data
3. Data Generation-generating data if data is not available.

Sources of Data:

Primary Data sources: surveys, interviews, experiments etc

Secondary Data sources: External data sources like Kaggle, Google, .gov datasets etc.

Best practices for Acquiring data:

1. Good Data: well structured, accurate, consistent, presentable and relevant.
 2. Web Scraping: collecting data from websites with permission.
 3. Unbiased: Avoiding any preferences or partiality in data.
 4. Consent: taking necessary permissions before collecting or using individual's data
 5. Transparency: without hiding intentions
 6. Anonymity: protecting the identity of the person as source of data
 7. Accountability: Taking responsibility for actions related to data
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Features of Data and Data Preprocessing

Data features are the characteristics or properties of the data. e.g. in student records table features are like student's name, age or grade. For a photo features like colors in image, height and width etc. For AI models there are two types of features:

1. Independent features: It include the information or input we provide to make predictions
2. Dependent features: It includes the output or result of the model, that we are trying to predict.

Usability of data depends upon the structure of data, cleanliness of data and its accuracy.

Data Processing and Data Interpretation

Data Processing: Operating on raw data to produce meaningful information using computers.

Data Interpretation: Analyzing data using com to arrive at meaningful decisions.

Methods of Data Interpretation: There are two methods of Data Interpretation

1. Quantitative Data Interpretation: Interviews, Polls, Observations, Longitudinal studies, survey
2. Qualitative Data Interpretation: Record keeping, Observation, case studies, Focus groups, Longitudinal studies, One to one interview

There are three ways in which data can be presented:

1. Textual DI: The data is in textual form, usually in paragraph suitable for small data which can be easily comprehended by reading but unfit for large data.
2. Tabular DI: Data is represented systematically in rows and columns where columns headings contain the description of information contained in columns.
3. Graphical DI: Data is represented using Bar graph, Pie chart and Line graph etc

Importance of Data Interpretation: 1. Informed decision making 2. Reduced cost 3. Identification of needs



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Project Interactive Data Dashboard & Presentation

Data can be collected and can be visualized using visual data analytics platform like tableau or MS Excel or Datawrapper using which graphs or chart can be prepared on the basis of collected data which aids in decision making like which is the highest yield grain in India among wheat, rice, jowar, barley etc.

Data Interpretation & Visualization

- **Textual Data Interpretation:** Paragraph descriptions
- **Tabular Data Interpretation:** Organized in rows & columns
- **Graphical Data Interpretation:** Bar charts, pie charts, line graphs

AI & Data Collection

- **How AI Uses Data:**
 - Social media recommendations
 - Weather forecasting
 - Self-driving cars
- **Data Collection Methods:**
 - Surveys, observations, interviews