FULFILLING DATA SKILLS

Fulfilling data skills refers to the ability to acquire, process, analyze, interpret, and present data in a way that meets specific goals or objectives.

1

Data Literacy

2

Data Analysis

3

Data Visualization
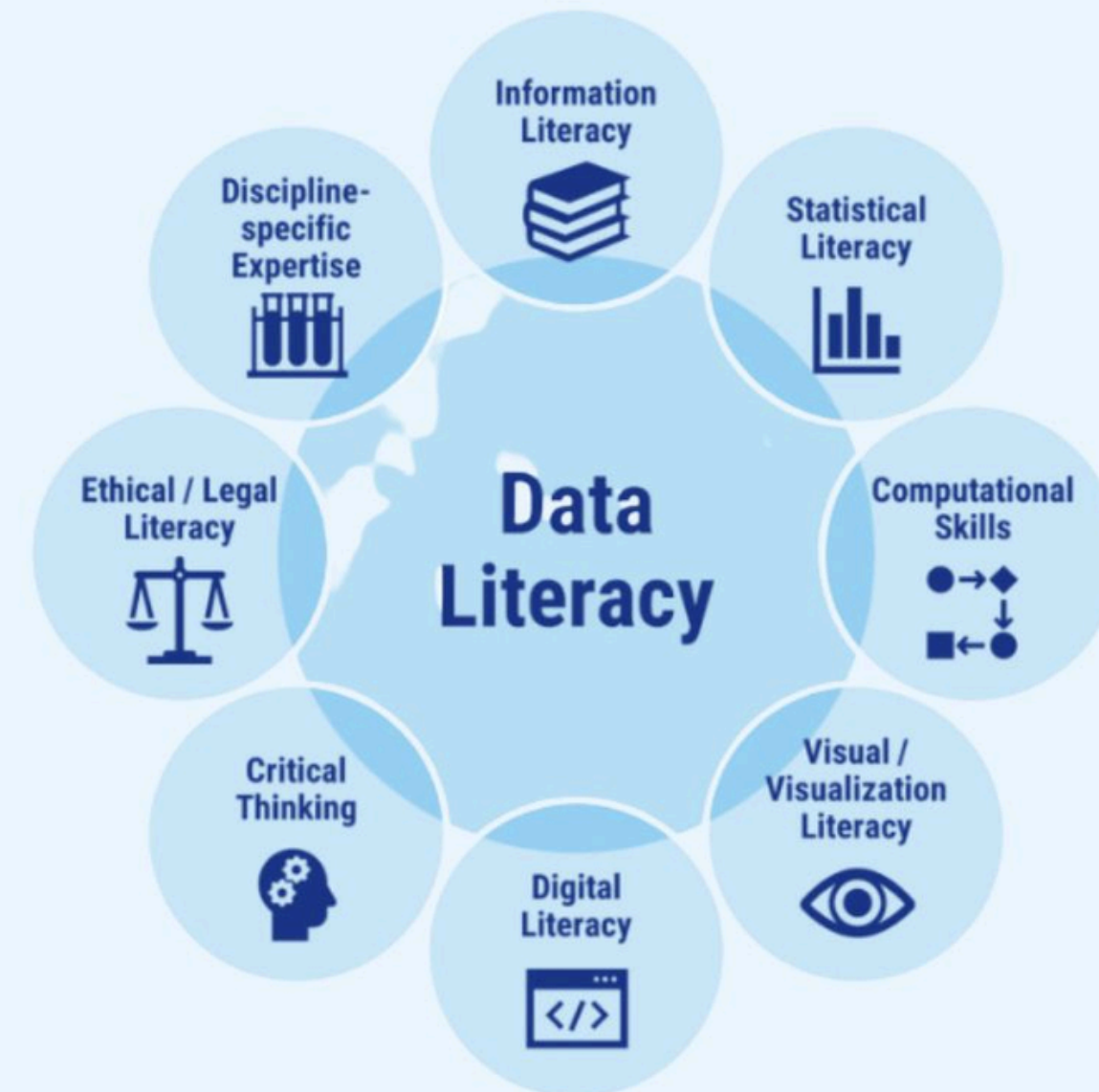
4

Data Management

5

Programming (Machine Learning, Big Data Technologies)

FULFILLING DATA SKILLS

DATA LITERACY

Ability to explore ,understand, and communication with data.

DATA LITERACY

It divided into Technical and Non-Technical Data Skills.

Technical Data Skills

Data Analysis	Data Visualization	Data Management
Programming	Big Data Technologies	Machine Learning

Non - Technical Data Skills

Critical Thinking	Research	Domain Knowlege
Reading Documents	Communication	Problem Solving

Non - Technical Skills

Critical thinking is essential for evaluating data objectively, identifying biases, and making sound judgments.

Research skills help in finding reliable data sources, verifying information, and exploring methods to analyze and interpret data.

Understanding the specific domain or field where data is applied is necessary for contextualizing data and drawing appropriate insights.

Data-related documents, such as reports, graphs, and technical papers, require strong reading skills to understand methodologies, results, and the context of the data.

Communicating insights from data clearly is key to sharing findings and making them understandable for different audiences, including those without a technical background

Problem-solving skills enable individuals to use data to address complex questions, make decisions, and innovate solutions.

How to improve these non-technical skills?

Critical Thanking

Analyzing Data: You begin by looking at sales data, noticing that one product's sales are down in the region. A simple analysis might conclude that the product is no longer popular. However, critical thinking urges you to look deeper.

Questioning Assumptions: Instead of assuming the drop is due to low demand, you explore other potential factors. Is there a supply chain issue? Has the product price changed? Are there new competitors in the area?

Solution

When analyzing data trends, ask why certain patterns exist. Are there any external factors influencing the data? Could there be errors or biases in how the data was collected?

Questioning Assumptions: Instead of assuming the drop is due to low demand, you explore other potential factors. Is there a supply chain issue? Has the product price changed? Are there new competitors in the area?

How to improve these non-technical skills?

Research

Knowing where and how to find reliable information quickly.

Solution

Learn how to use advanced search operators in databases and search engines (e.g., Google Scholar, PubMed). Understand boolean logic, filters, and keyword planning.

Example: When looking for economic growth data, instead of searching "economic data 2024," refine the query to "GDP growth data by country 2024 site:.gov" to find government-sourced and credible reports.

How to improve these non-technical skills?

Domain Knowledge

Familiarize yourself with industry terms, trends, and common challenges.

Solution

Read industry publications, white papers, and case studies, or attend industry conferences and webinars to stay updated

Example: If you're working with healthcare data, it's essential to understand terminology like "ICD codes" (International Classification of Diseases) and regulations like HIPAA (Health Insurance Portability and Accountability Act). Without this, you may mishandle sensitive information or misunderstand key data points.

How to improve these non-technical skills?

Reading Documents & Communication

Before reading, clarify what you need to extract. Are you looking for key insights, understanding an argument, or gathering specific facts? Take notes, underline key points, and write questions or thoughts in the margins. Focus on understanding what others are saying before formulating a response.

Solution

If you're reading a research paper, determine whether you need to focus on the methodology, results, or conclusions. When reading a technical paper, cross-reference the findings with similar studies to confirm the conclusions.

In meetings, make sure you fully understand the problem or question before responding with a solution. For detailed project updates, a report may be best, while quick questions can be handled via chat or email.
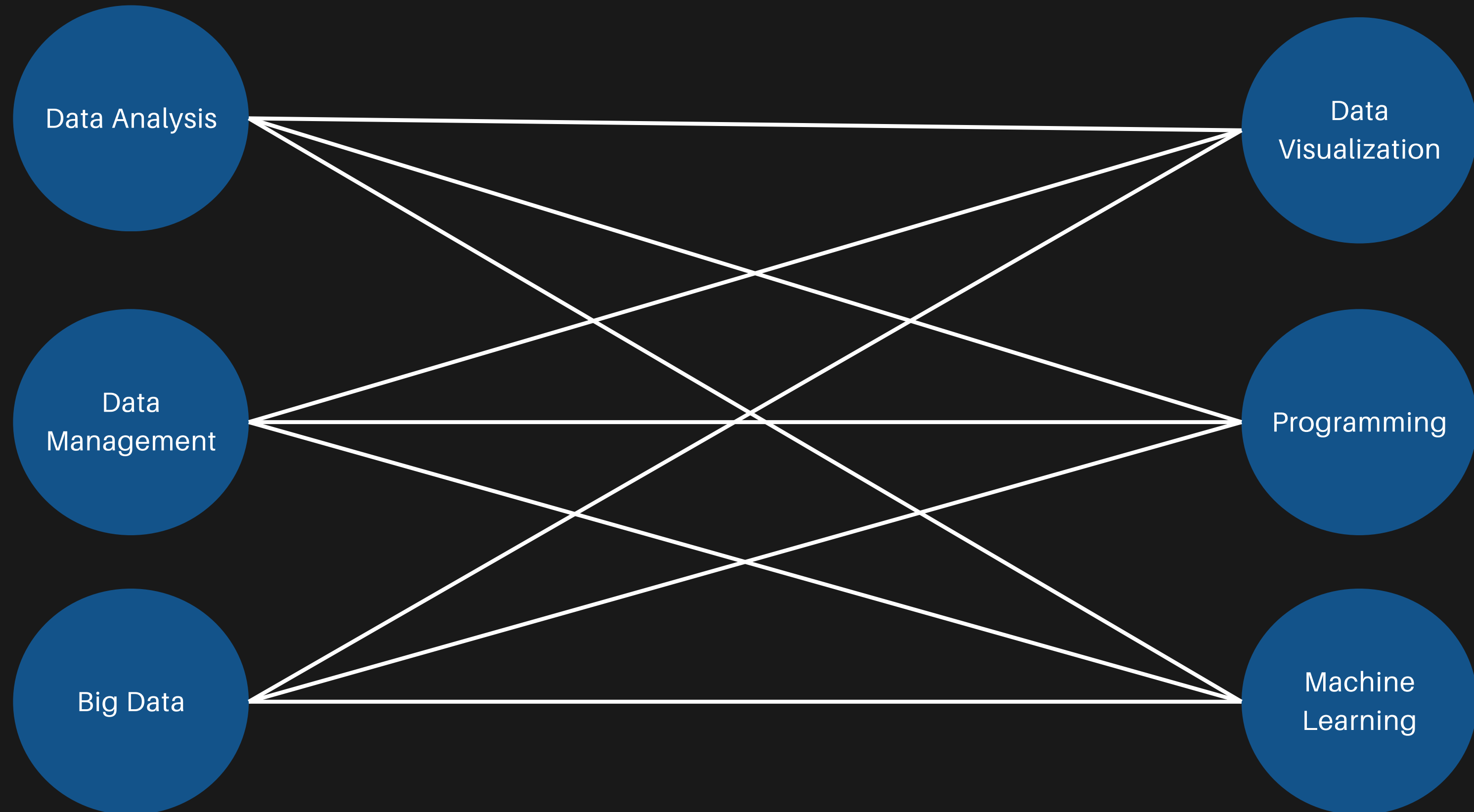
How to improve these non-technical skills?

Problem Solving

Improving problem-solving skills is essential in any domain, especially when working with data or technical tasks. Effective problem-solving involves the ability to identify, analyze, and resolve issues methodically, combining logical thinking with creativity.

Solution

Example: If you're facing discrepancies in sales data across different regions, instead of assuming it's a data entry error, ask questions like: "Why is the discrepancy happening? Is it regional differences, customer behavior, or data inconsistency?" In a project where a machine learning model underperforms, instead of trying to fix the whole model at once, break it down into steps: examine the data preprocessing, feature selection, model selection, and hyperparameters one at a time.
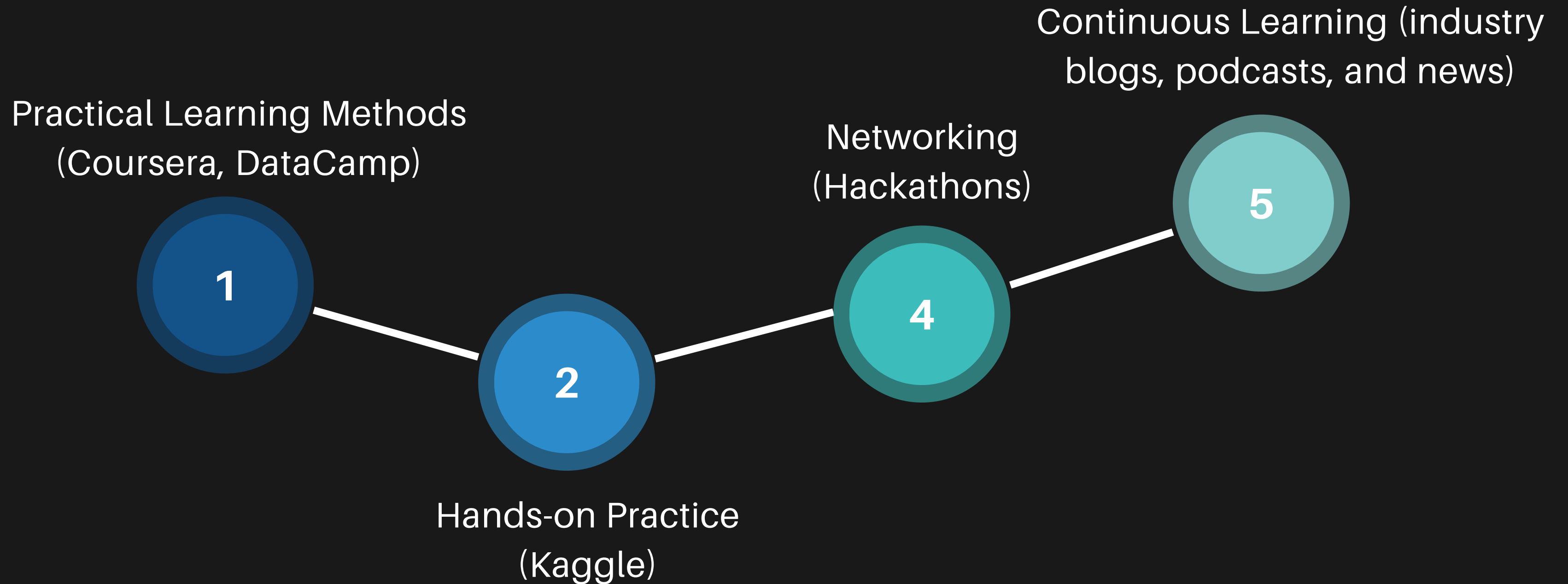
How technical skills are related?

HOW TO IMPROVE TECHNICAL SKILLS

1	2	3	4	5
Data Analysis	**Data Visualization**	**Data Management**	**Big Data Technologies**	**Machine Learning**
Master the fundamentals of statistics, probability, and data cleaning.	Learn how to use visualization tools like Tableau, Power BI, Matplotlib, or Seaborn.	Gain knowledge of database management systems (DBMS) like SQL, NoSQL, and data warehouses.	Familiarize yourself with technologies like Hadoop, Spark, and distributed computing systems.	Study machine learning algorithms (e.g., regression, decision trees, clustering).
Use tools like Excel, Python (with libraries such as Pandas, NumPy), or R for hands-on practice.	Practice designing clear, insightful graphs, charts, and dashboards.	Understand data governance, data integration, and best practices for ensuring data accuracy and security.	Understand the challenges and strategies for handling large datasets efficiently.	Learn frameworks like Scikit-learn, TensorFlow, or PyTorch for building models.
Work on real-world datasets to apply concepts and derive insights.	Understand which types of visualizations are most effective for different data types and audiences.	Learn about ETL (Extract, Transform, Load) processes to manage data pipelines.	Learn cloud-based big data solutions (e.g., AWS, Google Cloud, Azure) to scale your operations.	Work on hands-on projects to train, test, and improve machine learning models.

BUILDING DATA SKILLS

Practical Learning Methods
(Coursera, DataCamp)

1

Hands-on Practice
(Kaggle)

2

Networking
(Hackathons)

4

Continuous Learning (industry
blogs, podcasts, and news)

5

CHALLENGES IN FULFILLING DATA SKILLS

Learning curve for complex tools and frameworks

Handling large and unclean data

Keeping up with rapidly evolving technologies

REAL-WORLD APPLICATION OF DATA SKILLS

INDUSTRIES LEVERAGING DATA

Finance: Fraud detection, algorithmic trading

CASE STUDIES

Netflix's recommendation system powered by data
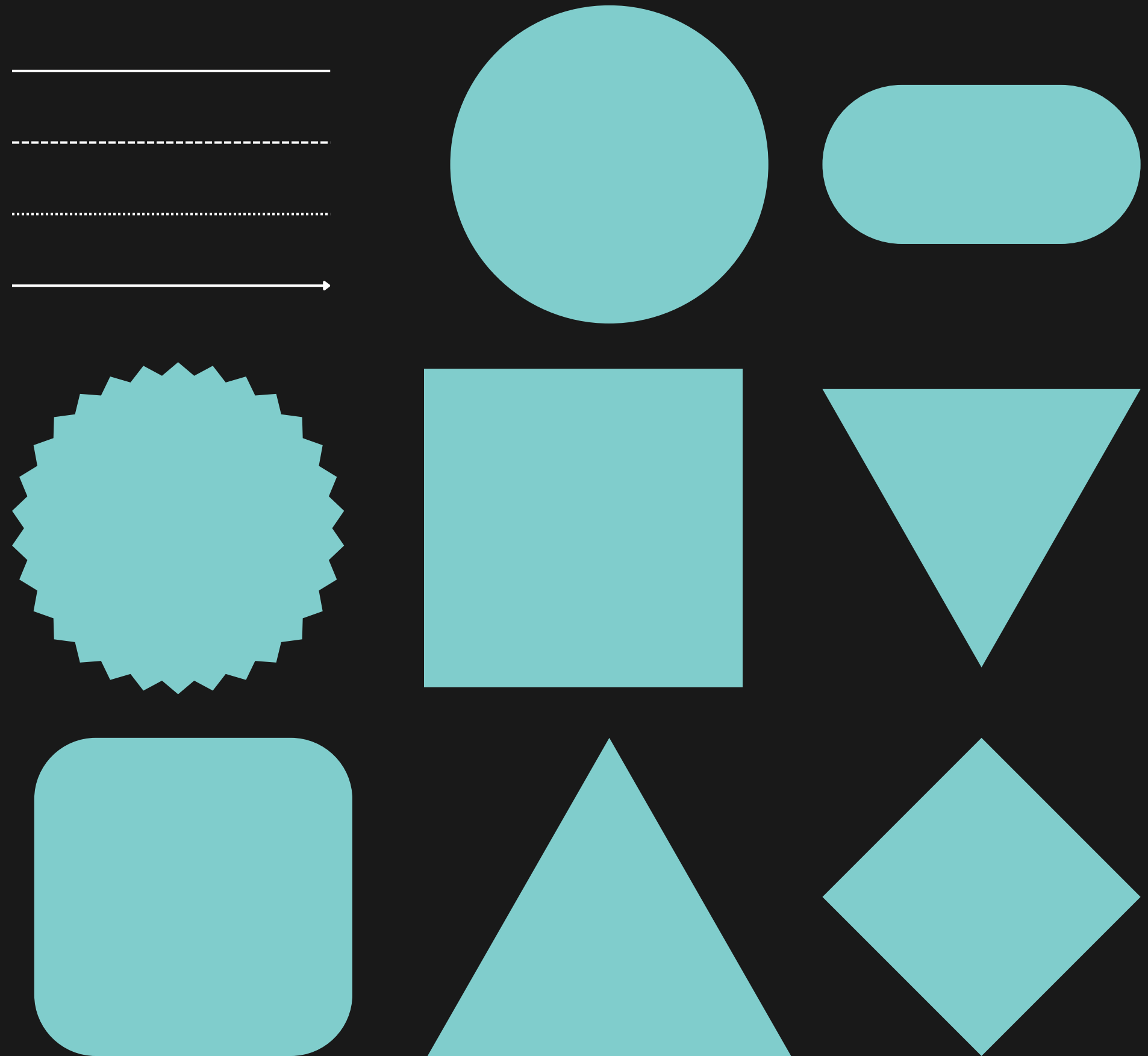Healthcare AI improving diagnostic

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