Introduction to Data Science Fundamentals

- Session overview: how this training boosts your daily role with data
- Real-world wins: 24% fewer fashion returns; 99% faster F1 data ops
- Your goal: more confidence, sharper questions, better team collaboration
- The core premise: data science is a new literacy for every professional, not just coders

What Is Data Science?

Core Ideas and Common Misconceptions

- Data science: Extracting insights from data to inform decisions and actions.
- Data analysis (past) vs. business intelligence (monitoring) vs. ML & AI (learning/cognition).
- Myths debunked: It doesn't require coding, big data isn't mandatory, and AI isn't infallible.
- Chef analogy: Raw data (ingredients) turned into a meal (insight) using tools (algorithms).

The Data Science Lifecycle: From Question to Impact

- - **CRISP-DM:** the most widely used framework, adaptable to any industry or tool
- - **Phase 1: Business Understanding** – define the problem and success criteria
- - **Phases 2-3: Data Understanding & Preparation** – collect, clean, and format data
- - **Phases 4-6: Modeling, Evaluation & Deployment** – build, validate, and apply insights
- - The lifecycle is iterative; expect to move back and forth between phases

The Foundation: Business Understanding

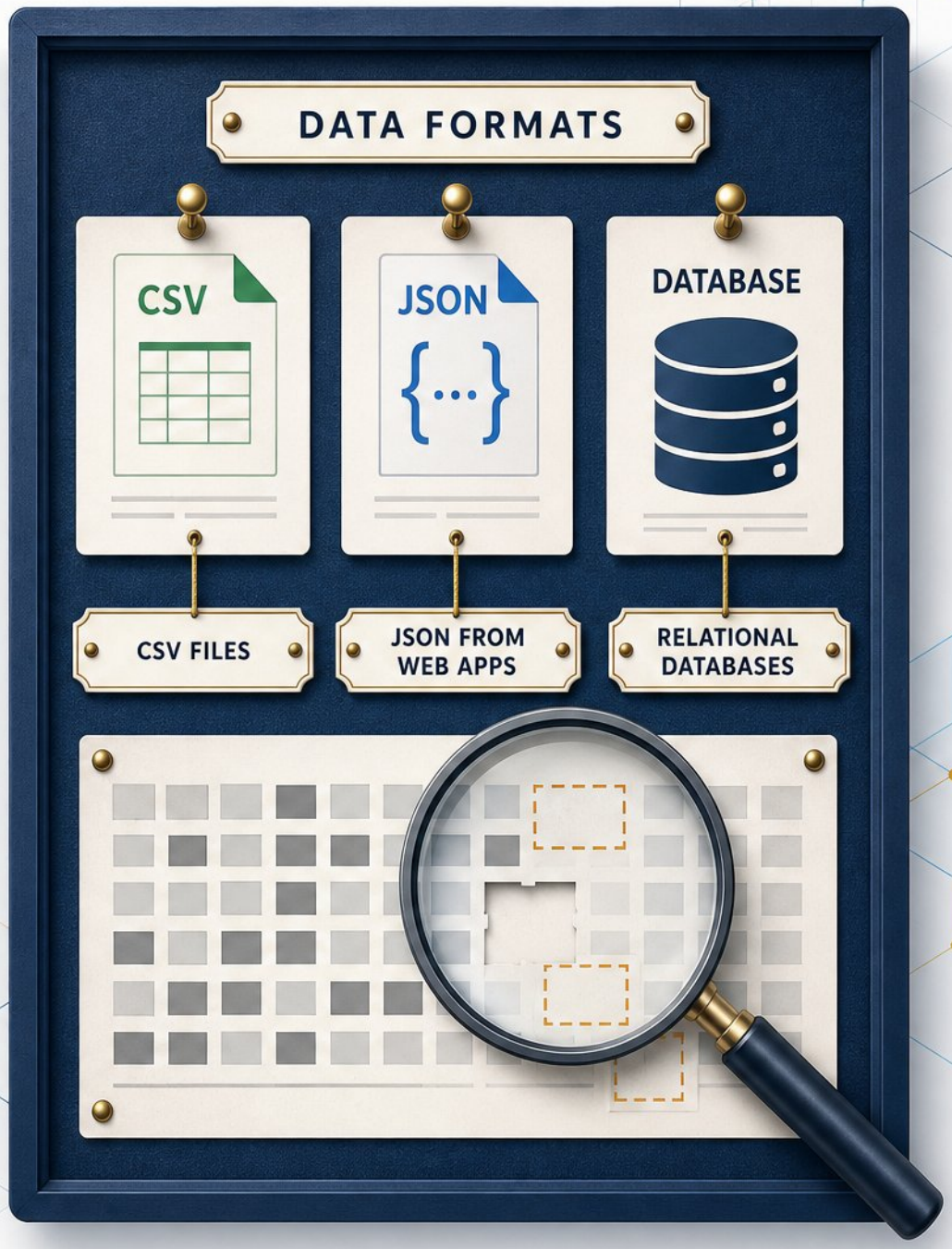
Vague Business Goal

Sharp Data Question

- Deeply grasp the 'why' behind the project to align with strategic goals
- Translate business problems into precise data questions (e.g., 'reduce churn' to 'predict likely cancellations")
- Define measurable success criteria ('reduce churn by 5%' not 'get insights")
- Assess resources, constraints, and assumptions to build a realistic project plan

Types of Data and Why They Matter

- Structured data: databases and spreadsheets (organized rows and columns)
- Unstructured data: text, images, and video (rich but messy)
- Common formats: CSV files, JSON from web apps, relational databases
- Data quality essentials: completeness, accuracy, and consistency
- Cleaning data often takes up to 80% of a project's time



Asking the Right Questions: From Curiosity to Clarity

- Framing a precise business question separates valuable analysis from wasted effort
- Good: "What caused the 12% drop in EU revenue?" vs. Vague: "How can we improve sales?"
- Watch for confirmation bias (seeking supporting data only) and data dredging (patterns without a hypothesis)
- Start with a measurable metric, define the timeframe, and identify the decision to inform

From Raw Data to Meaningful Insights:

The Four Types of Analytics

- **Descriptive:** "What happened?" – KPIs, dashboards, and sales reports
- **Diagnostic:** "Why did it happen?" – drill-down and root-cause investigation
- **Predictive:** "What will happen?" – forecasting, risk scoring, and probability
- **Prescriptive:** "What should we do?" – optimization and actionable recommendations

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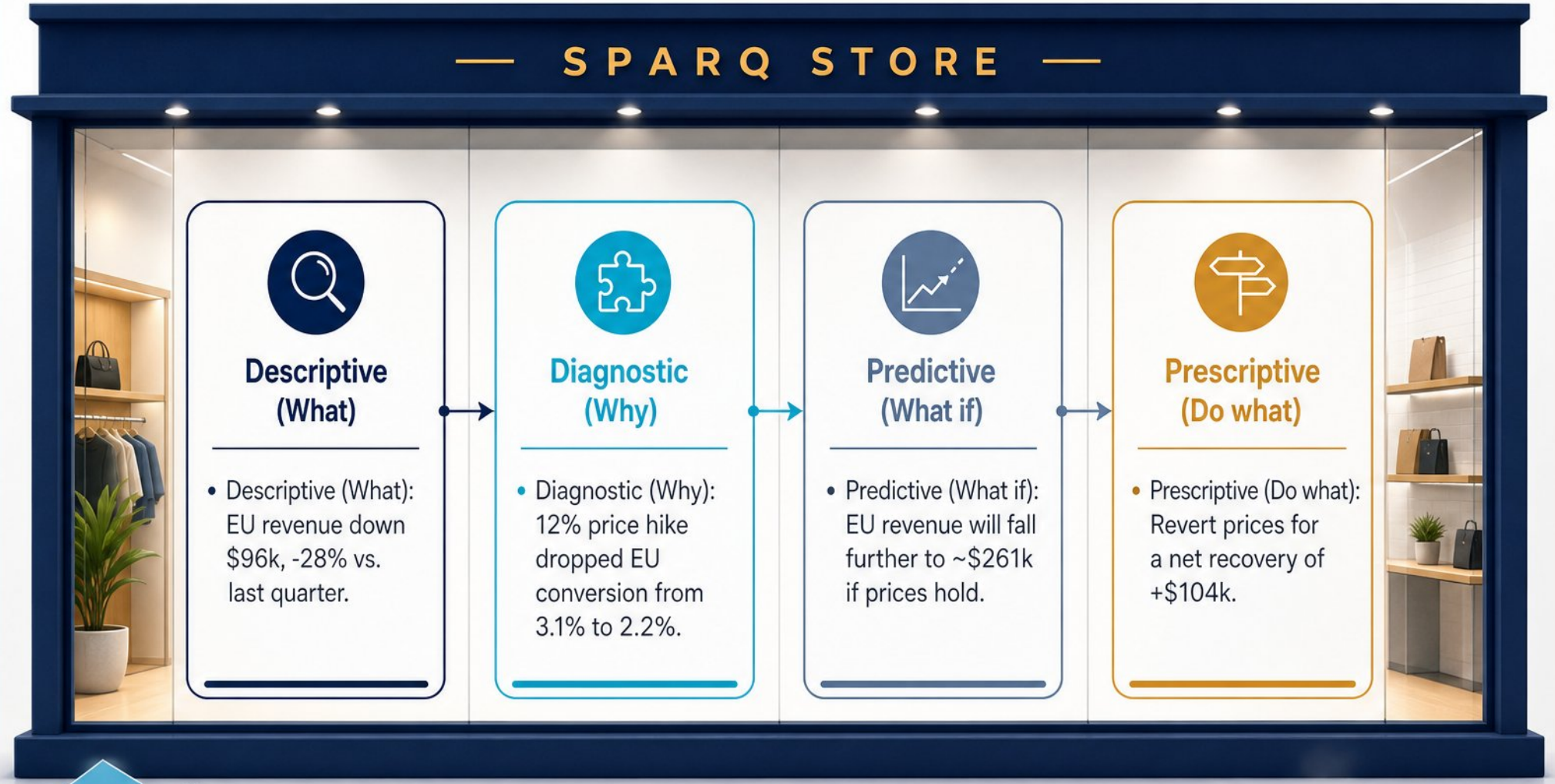
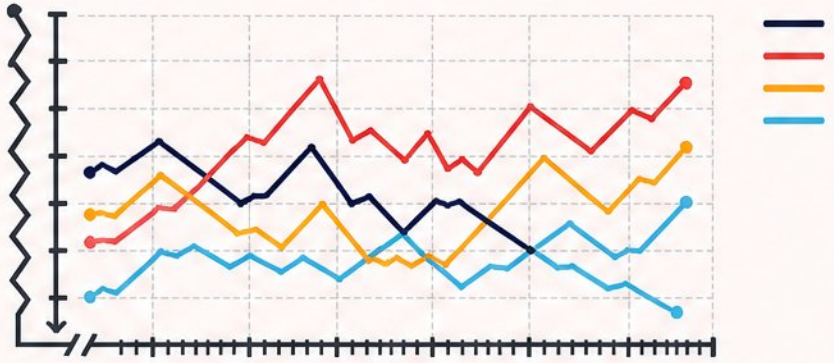
- Each rung depends on the one below; value and difficulty both increase

The Four Types of Analytics: A Deep Dive with Sparq Store



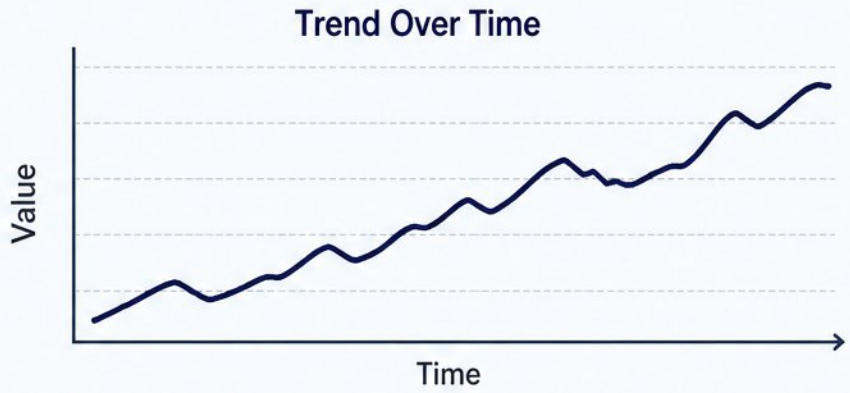
Visual Storytelling: Communicating Data Clearly and Honestly

MISLEADING & CLUTTERED



- Jagged/broken axes distort perception
- Multiple series and heavy grid create noise
- No clear labels or context
- Hard to see the real story

CLEAR & HONEST



- Straightforward axis shows true trend
- Single series focuses attention
- Clear labels provide instant context
- One key insight stands out

- Choose the right chart: bar for comparison, line for trend, scatter for relationship
- Declutter relentlessly to highlight the one key insight
- Provide clear context so audiences see the message instantly
- Avoid misleading axes, cherry-picked data, and overcomplicated visuals

Machine Learning and AI:
What You Really Need to Know in 2026

- - ML lets computers learn from data without explicit programming
- - Supervised learning predicts outcomes; unsupervised finds hidden patterns
- - Generative AI creates drafts, not final truth – human oversight is essential
- - AI agents are scaling fast: 74% of firms plan deployment within two years
- - Only 21% have mature governance for autonomous agents – guardrails are urgent

Ethics and Responsibility in the Age of AI

- Responsible AI: privacy, fairness, accountability, and transparency
- Bias in training data can lead to unfair automated outcomes
- Hallucinations: fluent, confident outputs that are completely wrong
- Only 13% of organizations have AI governance foundations in place
- Governance is everyone's role—question outputs, check data consent

Collaborating Effectively with Data Teams and Tools

- **Modern data team roles:** engineers build pipes, analysts find answers, scientists create predictive models.
- **Tool landscape:** spreadsheets, BI tools (Power BI, Tableau), and advanced platforms for Python & SQL.
- **Be a great collaborator:** share business context, set clear requirements, trust expertise, and iterate together.
- **The "grandmother test":** ensure a smart non-technical person understands your key message in 30 seconds.

Your Data Literacy Journey:
Practical First Steps

- Data literacy now as fundamental as writing; 88% of leaders agree

- #1 barrier to AI adoption isn't tech — it's lack of education

- New habit: before trusting a report, ask about source, analysis, and potential misinterpretations

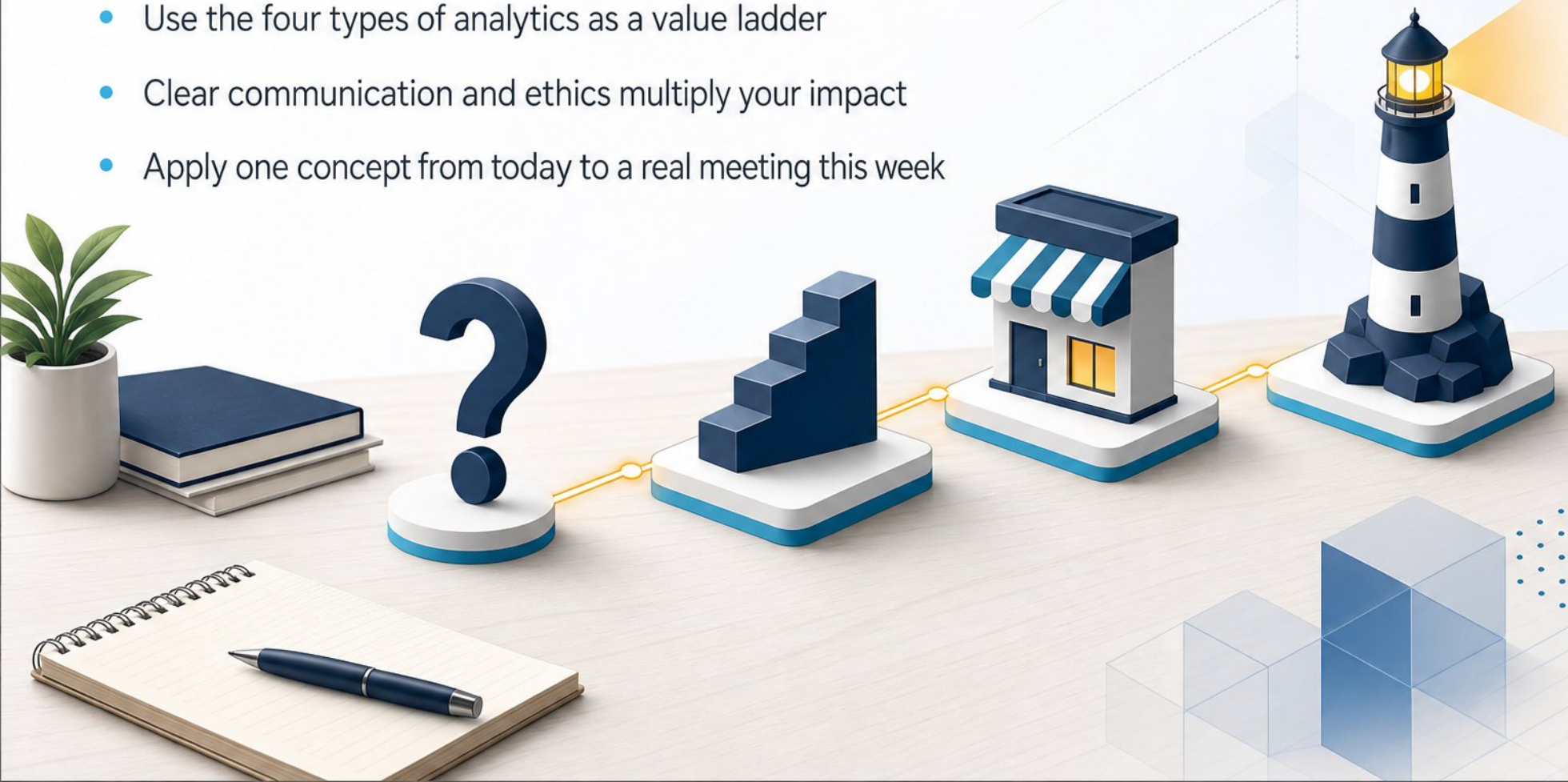
- Curated learning paths: CompTIA Data Analysis Essentials, Dataquest, and Storytelling with Data

The Human Edge in an AI-Powered World

- 74% say AI is critically important for success in 2026.
- Access to AI tools expanded 50%, but daily use remains under 60%.
- Humans set the right questions and exercise ethical judgment.
- Shift from data producer to data director: steer AI, verify output.

Key Takeaways and Your Data Journey Ahead

- Data science starts with a business question, not the data
- Use the four types of analytics as a value ladder
- Clear communication and ethics multiply your impact
- Apply one concept from today to a real meeting this week



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