

Data Science: Concepts, Purpose, and Examples

- Multidisciplinary field: statistics, programming, domain expertise
- Transforms raw data into actionable, cross-industry insights
- Training covers concepts, applications, workflow, and tools
- Powers recommendations, fraud detection, and demand forecasting



What is Data Science?



- Multidisciplinary field:
Statistics + Computer Science +
Business Strategy



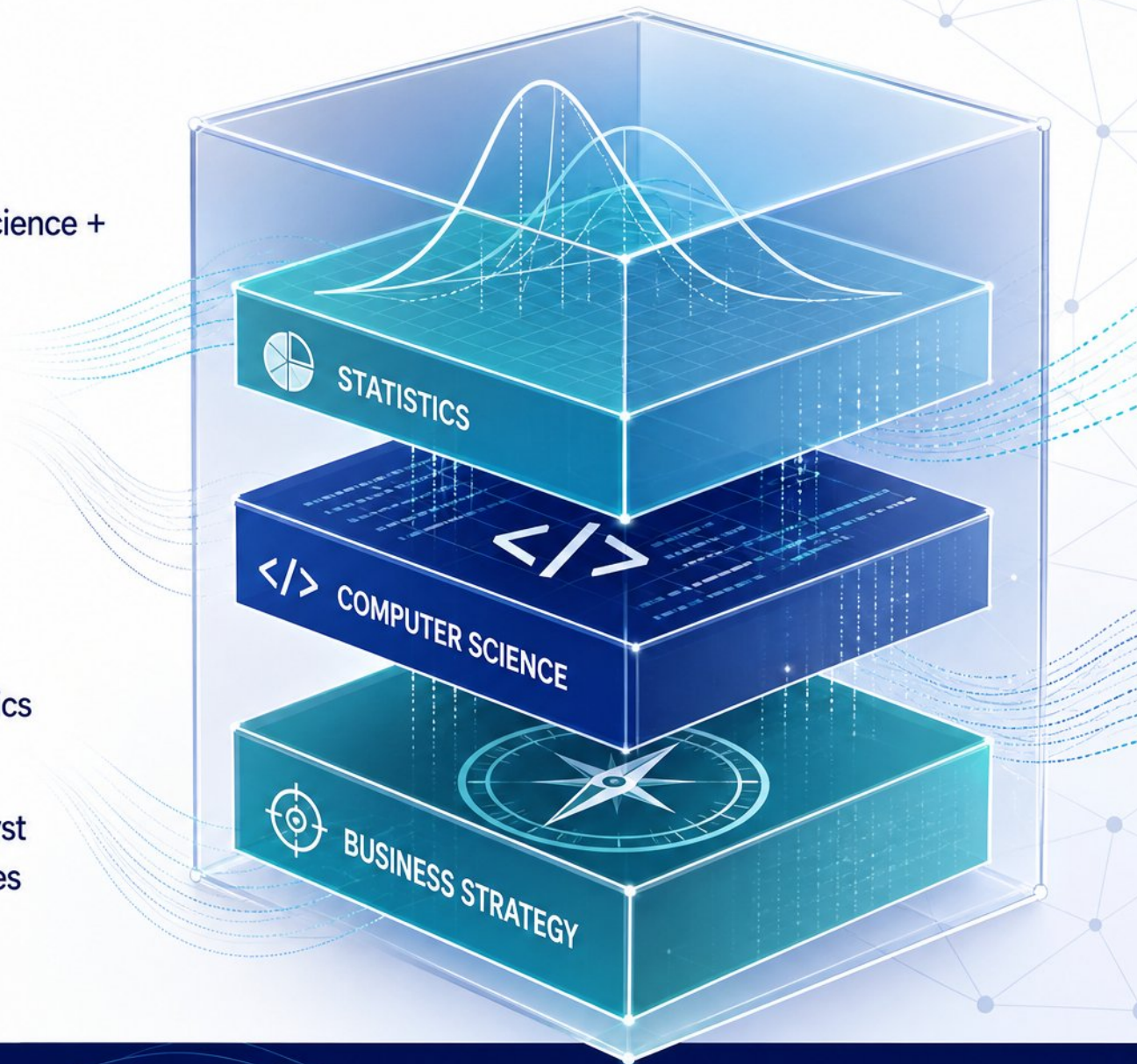
- Data Science vs. BI:
Predicting the future vs.
reporting the past



- Algorithms are recipes,
models are summaries,
features are characteristics



- Data Scientist vs. Analyst
vs. Engineer: Distinct roles
across the pipeline



Why Data Science Matters Now

- Raw data into competitive advantage and measurable ROI
- Transforms marketing, operations, finance, HR, and products
- Evidence-based decisions replacing intuition-driven choices
- Requires ethical AI use and robust bias mitigation
- Real-world examples across every core business function



Real-World Examples: Healthcare & Retail



-  - Predictive diagnostics and personalized medicine in hospitals
-  - AI streamlines claims denial prediction and revenue cycles
-  - Demand forecasting and hyper-personalized product suggestions
-  - Smart inventory optimization reduces stockouts and waste
-  - Case study: BigBasket's real-time analytics on a data lakehouse

Real-World Examples: Finance & Logistics

FINANCE



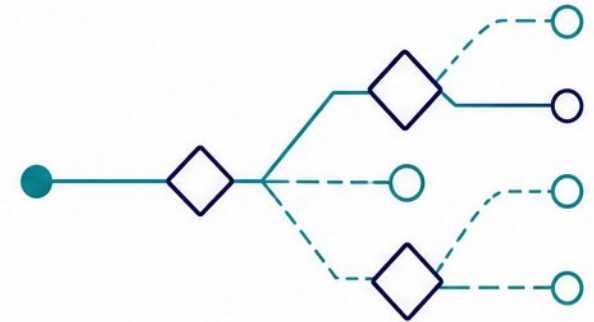
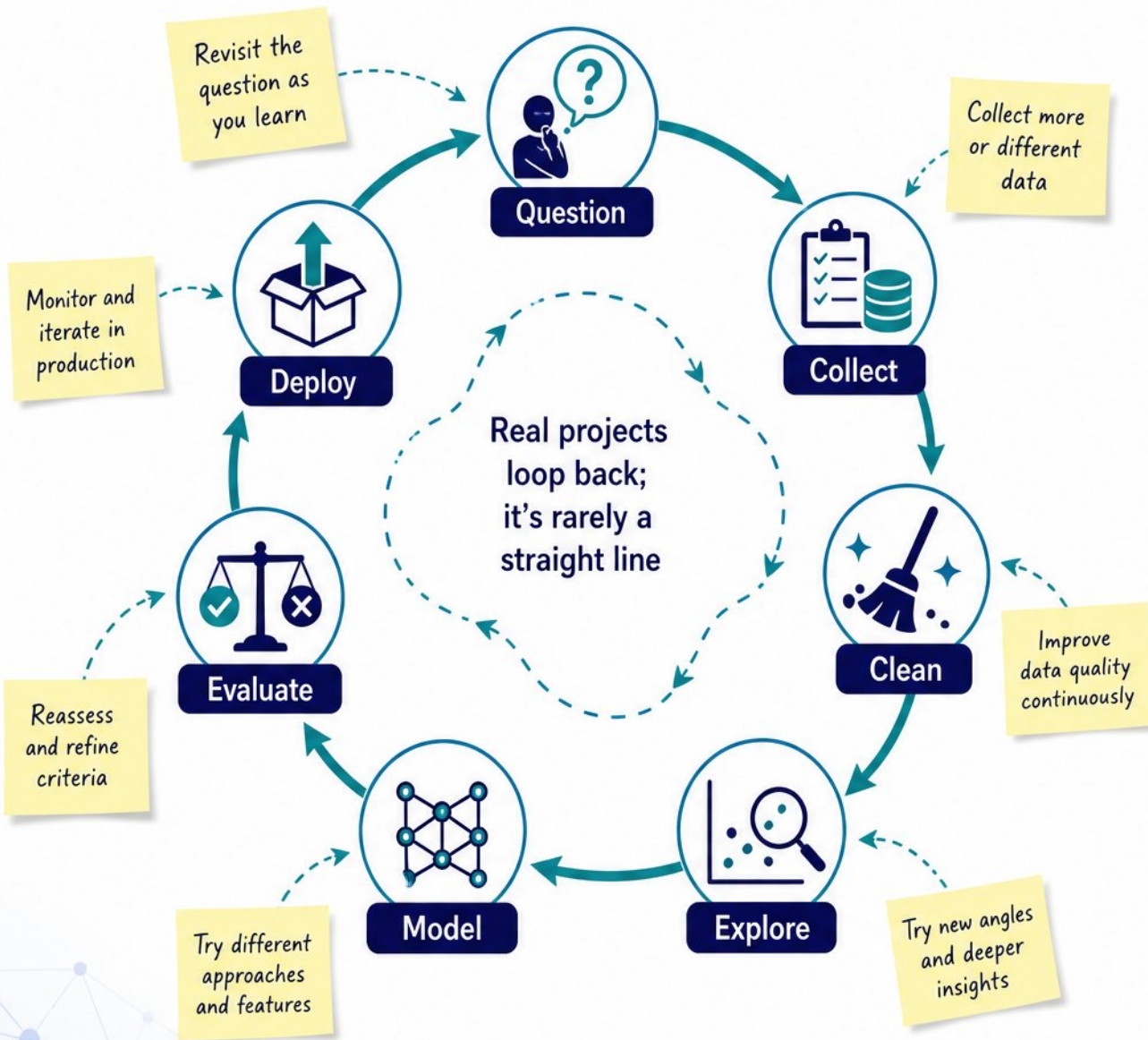
- Real-time fraud detection via anomaly and graph analytics
- Algorithmic trading, credit scoring, and personalized banking

LOGISTICS



- AI-powered route optimization and predictive fleet maintenance
- Predictive demand sensing and autonomous warehouse systems

The Data Science Workflow: From Question to Action



– Frame the problem, then collect and clean data



– Garbage in, garbage out: skip a step, risk failure



– Real projects loop back; it's rarely a straight line



– Business input is vital at every stage for value

Demystifying Data: Quality, Types, and Governance



- **Structured vs. unstructured data:** tables, text, images, and sensor data



- **Data quality pillars:** completeness, accuracy, consistency, and timeliness



- **Garbage in, garbage out:** how poor data directly undermines business decisions

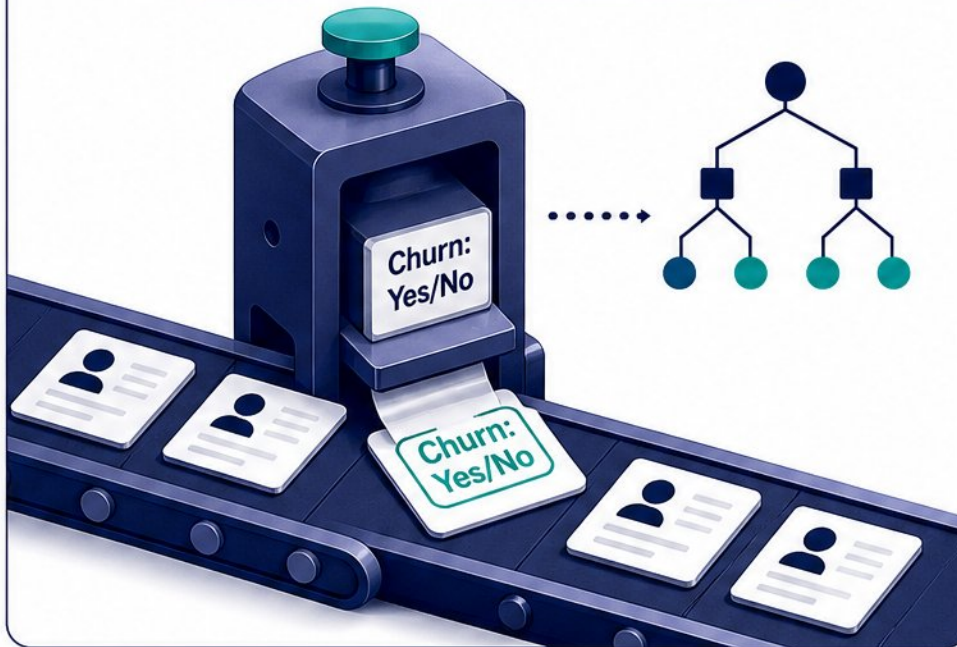


- **Shared ownership of data quality and governance** across the organization

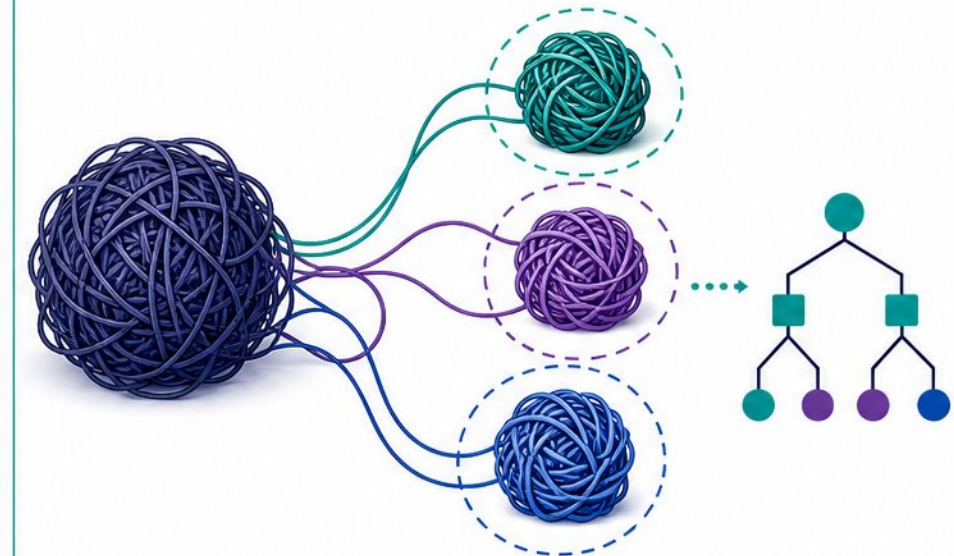


Common Techniques: Supervised and Unsupervised Learning

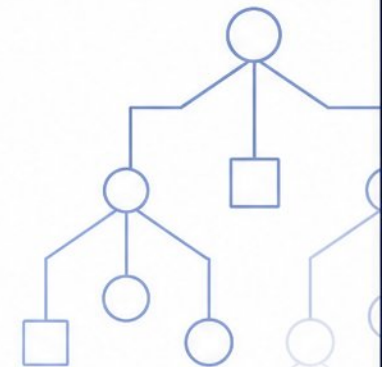
SUPERVISED LEARNING



UNSUPERVISED LEARNING



- ✓ - Supervised: Predict a label (churn, lead score) from past examples
- ✓ - Classification for yes/no; regression for numeric outcomes
- ✓ - Unsupervised: Discover unknown patterns, segments, and anomalies
- ✓ - Customer segmentation and fraud flags without pre-labeled data
- ✓ - Use 'predict X' for targets; use 'find groups' when exploring



Common Techniques: Reinforcement Learning, NLP, and Generative AI

- **Reinforcement learning:** trial-and-error to maximize rewards (e.g., dynamic pricing)
- **NLP & Generative AI:** chatbots, text summarization, and sentiment analysis
- **Business-ready tools:** text-to-SQL and automated report generation
- **Agentic AI:** autonomous systems that plan and execute multi-step tasks



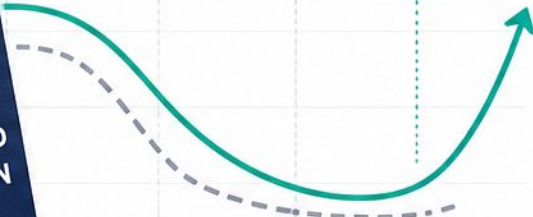
AI in Action: Retail Pricing and Insurance Fraud



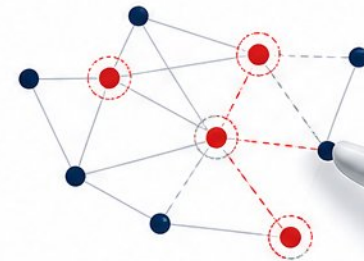
Hunkemöller: AI markdowns lifted both revenue and margins



REVENUE SPIKE



Mapfre Insurance: Graph analytics saved \$5M in fraud value



\$5M
SAVED IN FRAUD VALUE



Hunkemöller: AI markdowns lifted both revenue and margins



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Explainability builds user trust by showing model decisions



Focus AI on core commercial levers and measurable KPIs



Real ROI comes from targeted, explainable applications

Building a Data-Driven Culture



Leadership models curiosity and evidence-based decisions



Break down data silos through cross-functional collaboration



Assess current maturity and identify internal champions



Frame clear business questions, not vague data requests



Getting Started: Tools for Beginners (No-Code/Low-Code)



- Ask questions in plain English with tools like AnalyzeData and KNIME



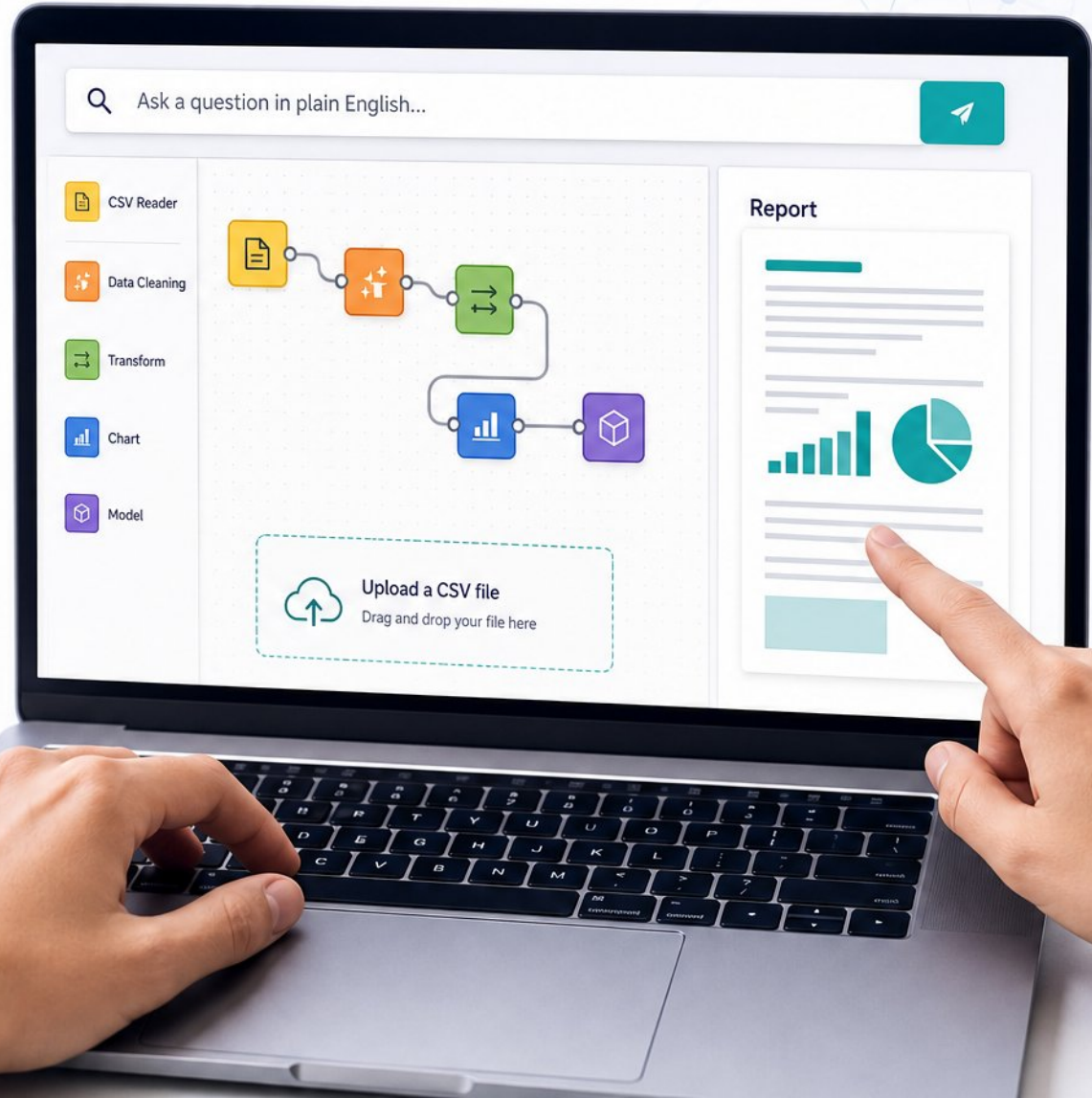
- Use drag-and-drop interfaces for cleaning, charts, and basic models



- AI assistants explain results in simple language instantly



- Upload a CSV and generate a complete report without coding



Getting Started: Skills, Pilots, and Resources



- Build statistical thinking, data literacy, and business acumen



- Explore top online courses, certifications, and communities



- Encourage practical learning without overhauling your team



- Launch pilot projects with clear goals and accessible data



Key Takeaways and Next Steps



Data science blends process, technology, and people.



Shift from intuition to evidence-based decisions.



Identify one data question in your role this week.



Use community hubs and programs to stay current.



PersonWise.

PersonWise • AI digital-human course platform



Scan the code or click anywhere to watch this course live, with voice Q&A

personwise.ai/t/6b3d54e8/public