

Business Analytics Skills:

Core Skills and Practice



- Build employer-relevant skills that turn business questions into defensible recommendations



- Distinguish business analytics from BI and data science in daily work



- Follow the value chain: data → information → insight → decision → impact



- Apply the four analytics types: descriptive, diagnostic, predictive, prescriptive



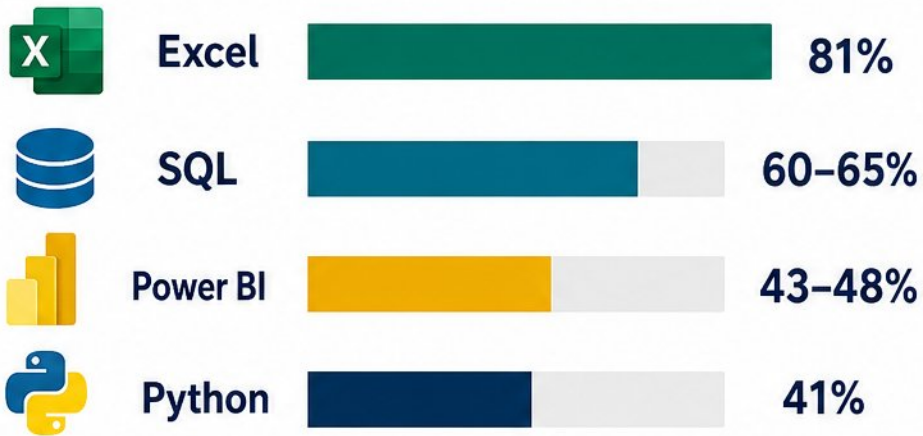
- Develop the core skills map, ending in a portfolio-ready deliverable



What Employers Expect from Early-Career Analysts in 2026



Tool Demand in Analytics Postings



Percent of analytics job postings mentioning each tool

What Employers Expect



- Excel leads at 81% of analytics postings, SQL at 60–65%
- Power BI 43–48%, Python 41% — the core four tools
- BA postings: requirements gathering and stakeholder work in 80%+
- AI and ML literacy rising fast: 18% entry-level, up to 48% senior
- Employers screen for a clear question, defensible method, plain-language conclusion
- Course implication: Excel and SQL first, one BI tool, then Python



Entry-Level Analyst Roles



Business Analyst



Data Analyst



Reporting Analyst



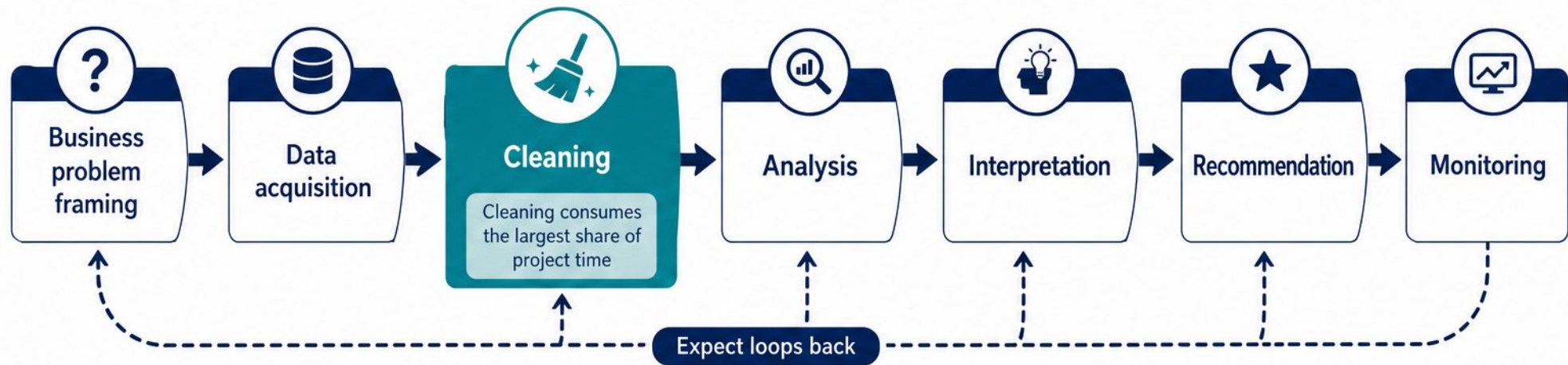
BI Analyst



Insights Analyst



The Analytics Workflow: From Business Question to Decision



- Business problem framing → data acquisition → cleaning → analysis → interpretation → recommendation → monitoring
- **CRISP-DM**: business understanding, data understanding, data preparation, modelling, evaluation, deployment
- **OSEMN**: obtain, scrub, explore, model, interpret — lighter, data-centric; assumes the question is settled
- **CRISP-DM** anchors on business objectives and deployment; **OSEMN** suits small projects
- Translate vague requests into testable questions before touching data
- Expect loops back; cleaning consumes the largest share of project time
- Checkpoints: hypotheses, data quality report, analysis notes, executive summary



Data Literacy: Sourcing, Assessing, and Preparing Business Data

PROFILING CHECKLIST

Six core dimensions

Completeness



Uniqueness



Timeliness



Validity



Accuracy



Consistency



Customer ID	Customer Name	Email	Region	Signup Date	Channel
—	—	—	—	—	—
—	—	—	—	—	—
—	—	—	—	—	—
—	—	—	—	—	—

Missing value

Duplicate row

Other issue



- Sources: transactional systems, CRM/ERP, surveys, web channels, third-party data



- Six core dimensions: completeness, uniqueness, timeliness, validity, accuracy, consistency



- ISO 25012 defines 15 dimensions; practice adds governance, usefulness, quantity, semantics



- Profile and clean: missing values, duplicates, outliers, type conversion, joins and keys



- Accuracy needs real-world or authoritative reference — not the dataset itself



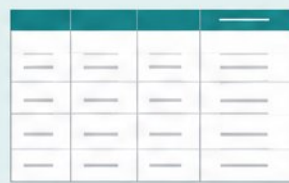
- Privacy basics: PII handling, consent, retention, least-privilege access



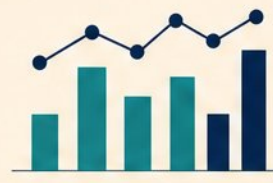
- Document dictionaries, cleaning logs, and transformations for reproducible, auditable analyses



Raw Data Sheet



Cleaned Table



Chart



Executive Summary Slide



Descriptive Analytics:

Summarising and Visualising Business Performance



- **Descriptive statistics:** central tendency, dispersion, distributions, rates and ratios



- **Anchor metrics:** revenue, margin, churn, conversion, retention



- **Segment and compare:** cohorts, period-over-period, benchmarks



- **Match chart to question:** line = trend, bar = comparison, scatter = relationship



- **Stacked bar** shows composition; heatmap reveals matrix patterns



- **Design rules:** sort bars by value, start at zero, avoid 3D and crowded pies



- **Read critically:** truncated axes and poor scales mislead viewers

Match the Question to the Right Chart



How is a metric changing over time? →



Line Chart (Trend)



How do categories compare with each other? →



Bar Chart (Comparison)



Is there a relationship between two variables? →



Scatter Plot (Relationship)



What is the composition of each category? →



Stacked Bar (Composition)



Is this chart potentially misleading? →



Truncated Axis (Misleading)



Dashboard Design: Turning Metrics into Decision Tools



Start from the decisions your audience makes, then pick metrics



Keep 5-9 primary metrics per view; use the 5-8-15 rule



Primary KPI top-left; largest space for the most important metric



Every metric needs a target, trend, or benchmark



Tier metrics: outcome KPIs, driver metrics, drill-down detail



Add target bands, alert rules, and a named owner per KPI



Automate data feeds; review and prune metrics quarterly





Diagnostic Analytics: Root-Cause Analysis and Business Reasoning



- **Diagnostic questions:** why performance changed, where variation concentrates, what drives the gap



- **Techniques:** 5 Whys, fishbone diagrams, Pareto charts, change analysis, scatter diagrams



- A strong root cause explains timing, affected cohorts, real-world sense, and intervention point



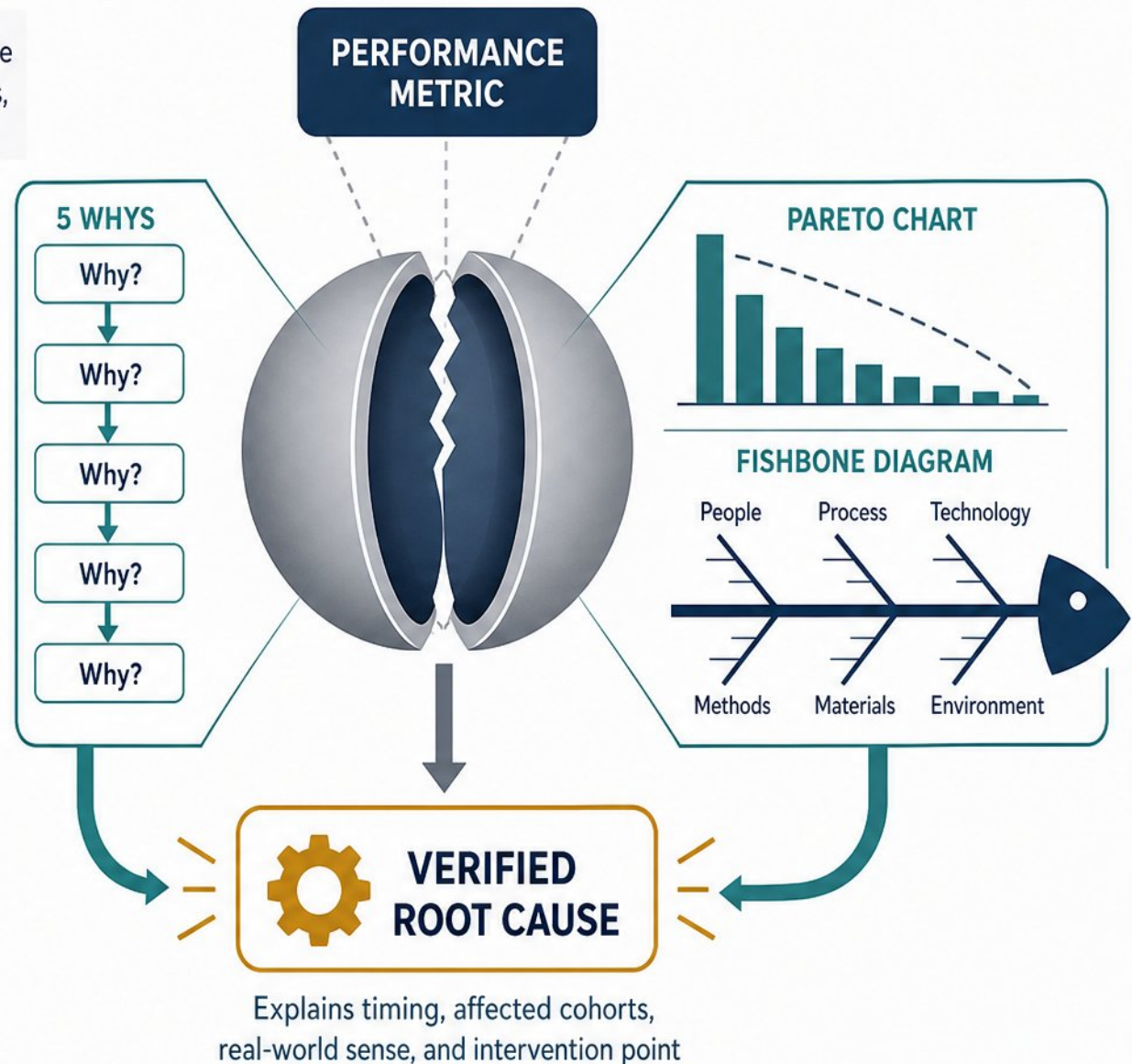
- Separate correlation from causation; watch confounding, selection bias, Simpson's paradox



- Move from aggregates to individual units; compare affected versus unaffected cases

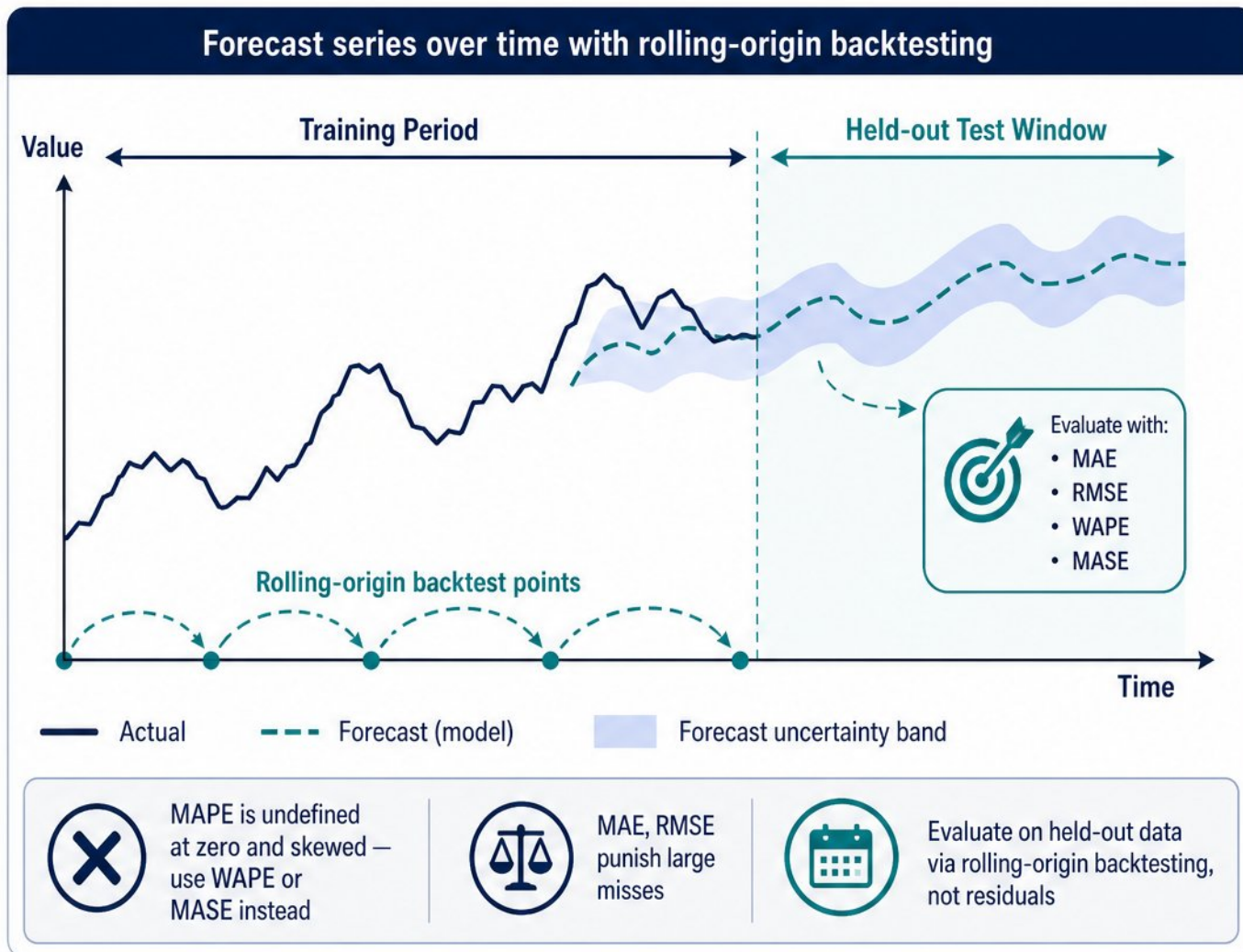


- Validate the mechanism, then communicate findings with confidence levels and caveats



Forecasting and Basic Predictive Concepts for Business

- Forecasting use cases: demand, revenue, churn, staffing, inventory planning
- Simple methods often suffice: moving average, trend, seasonality
- Fundamentals: features, labels, training/testing, overfitting
- Accuracy metrics: MAE, RMSE punish large misses; MAPE breaks on zeros
- MAPE is undefined at zero and skewed — use WAPE or MASE instead
- Evaluate on held-out data via rolling-origin backtesting, not residuals
- Analysts add value through framing, data quality, interpretation



Data

Collect and organize



Information

Process and summarize



Insight

Discover patterns and drivers



Decision

Choose actions with confidence



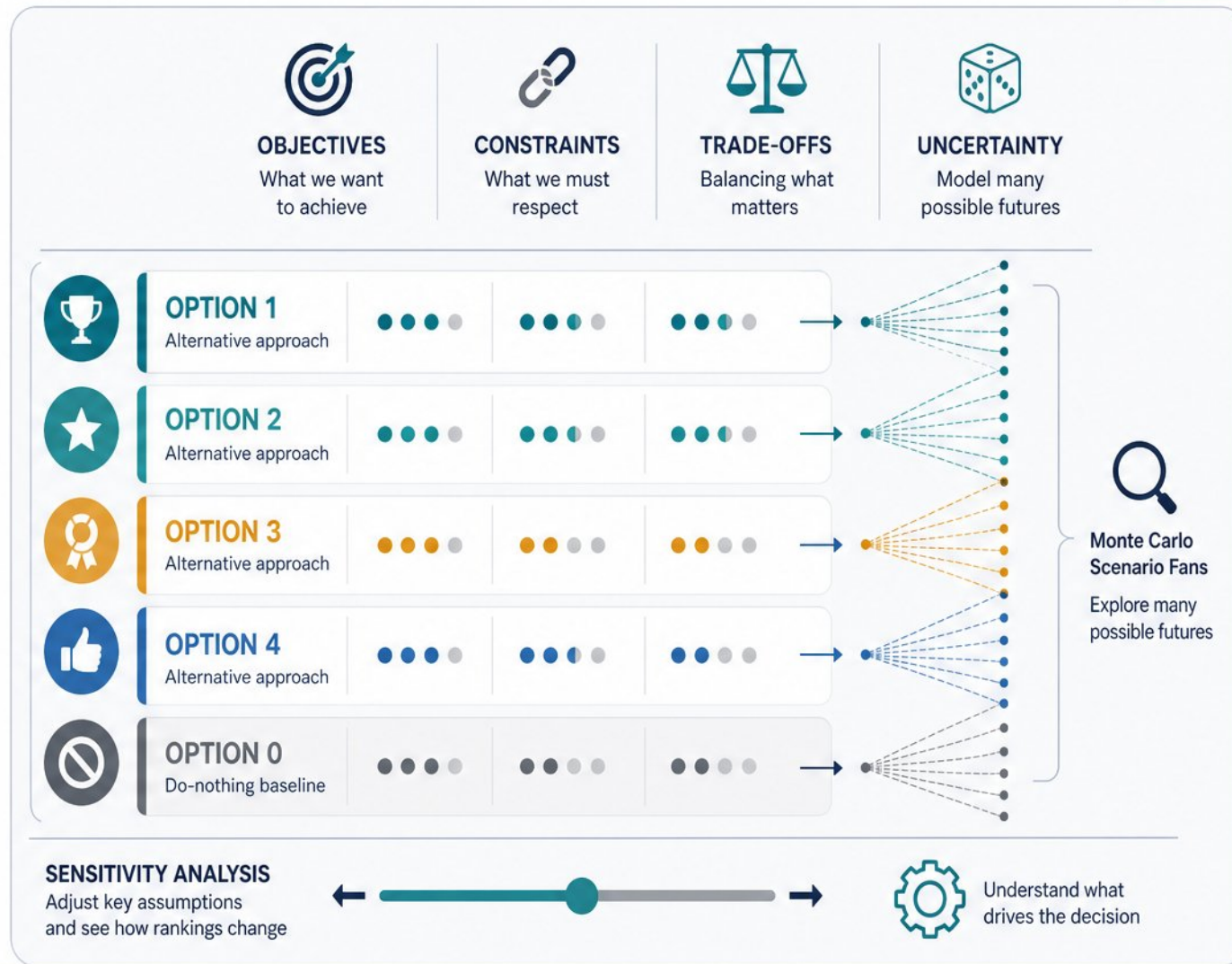
Impact

Create value and improve



Prescriptive Analytics and Decision Support

- From prediction to action: optimisation, simulation, decision rules
- Core vocabulary: decision variables, objectives, constraints, trade-offs
- Linear/integer programming for routing and scheduling; Monte Carlo for uncertainty
- Test dozens of scenarios, not one — show how recommendations react
- Publish two to five ranked options with projected outcomes
- Decision matrices and scoring models for multi-criteria choices
- Document assumptions, risks, and the do-nothing baseline
- Reported results: 10–40% better on-time delivery, up to 70% lower inventory



EXPLORE

Frame the problem and data



MODEL

Optimise, simulate, and evaluate



COMPARE

Rank options across criteria



DECIDE

Select, plan, and act



MONITOR

Track outcomes and learn

Analytics Tools and Technical Core Skills

 Technical Core Skills	 Spreadsheet (Excel)  	 SQL (Query) <pre>SELECT column1, column2 FROM table_name WHERE condition JOIN other_table ON table.id = other_table.id GROUP BY column1 -- window functions</pre>	 Python or R (Data Frames) <pre>import pandas as pd df = pd.read_csv('data.csv') df2 = df.groupby('category') .agg({'value': 'sum'}) df3 = df.merge(df2, on='category') df3.plot(kind='bar')</pre>
	Pivot tables, lookups, clean modelling	Foundations: SELECT, WHERE, JOIN, GROUP BY, plus window functions	Basics: data frames, groupby, merging, simple visualisation with pandas
 BI Platform Options	 Power BI Cost plus Microsoft integration	 Tableau Visual depth	 Looker Governed LookML metrics
	 Approximate 2026 pricing: Power BI Pro ~\$10–14	 Tableau Viewer ~\$15 and Creator ~\$75 per user monthly	 Looker custom-quoted

- Spreadsheets remain the most universally required tool: pivot tables, lookups, clean modelling
- SQL foundations: SELECT, WHERE, JOIN, GROUP BY, plus window functions
- Python or R basics: data frames, groupby, merging, simple visualisation with pandas
- BI platform positioning: Power BI (cost plus Microsoft integration), Tableau (visual depth), Looker (governed LookML metrics)
- Approximate 2026 pricing: Power BI Pro ~\$10–14, Tableau Viewer ~\$15 and Creator ~\$75 per user monthly; Looker custom-quoted
- Match the tool to the task, team skills, data stack, and governance
- Learn in sequence: Excel and SQL first, then one BI tool, then Python

Data Storytelling:

Communicating Findings That Drive Decisions



- **Lead with the answer:** BLUF and the pyramid principle put the recommendation first



- **Structure the story:** context → finding → cause → recommendation, or situation → complication → resolution



- **One message per slide,** one chart per point; delete chartjunk and protect data-ink



- **Annotate the insight directly** — say what changed and why



- **Match format to audience:** executives get ~5 slides; analysts get method and drill-down



- **Present forecasts as ranges or decision trees,** and state assumptions and limits

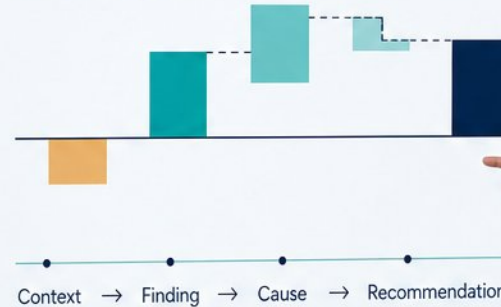


- **Pre-empt pushback:** keep supporting detail in an appendix and name the strongest counter-argument

Recommendation

We recommend Option B.

Key Driver Impact



Insight:

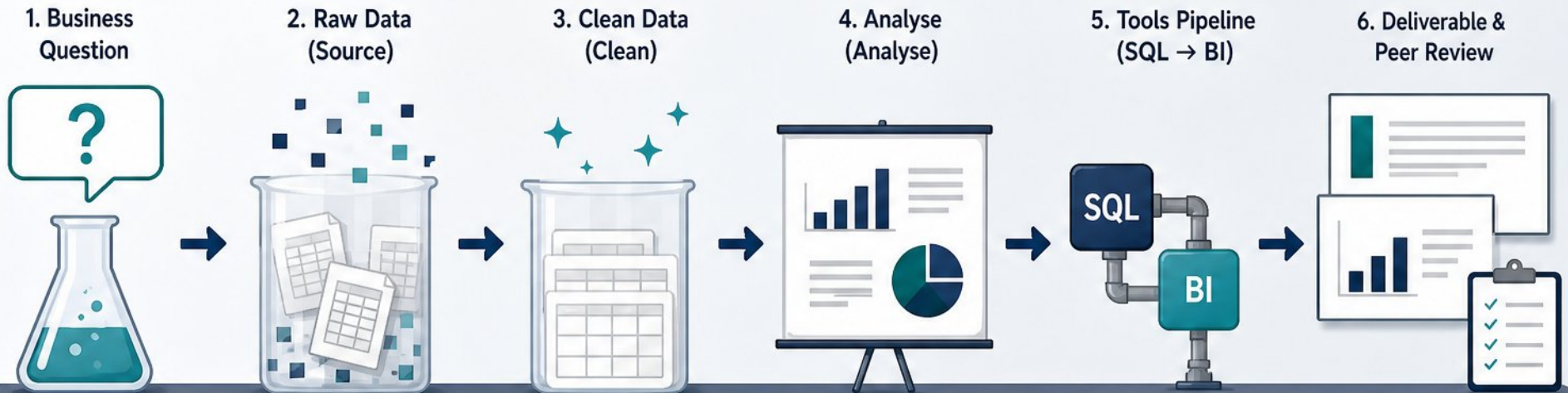
Improvement driven by key drivers lifting outcome while limiting offsetting factors.

Story Flow

Context
↓
Finding
↓
Cause
↓
Recommendation

APPENDIX
SUPPORTING DETAIL
METHODS
ASSUMPTIONS & LIMITS
COUNTER-ARGUMENT

Practice Lab: An End-to-End Business Analytics Case



- Frame the business question: sales performance, churn, or funnel conversion
- Walk the full lifecycle: source, clean, analyse, recommend
- Tool path: SQL for extraction and aggregation, then Power BI or Tableau
- Run one root-cause drill-down plus a forecast
- Deliver a two-slide executive summary: recommendation first, then one chart
- Peer review rubric: rigour, clarity, business relevance, actionability
- Check failure modes: buried conclusion, too many charts, no baseline, unstated assumptions

Building Your Portfolio and Continuing Professional Growth



- Aim for 3–4 business-framed projects; 5 is the sweet spot



- Each project: problem, dataset, cleaning, tools, insights, recommendation



- Lead with SQL + BI; add a second industry, then Excel or Python



- Use free datasets from government and open-data portals



- Certifications (Google, IBM, IIBA) build structure — projects win interviews

Your Growth Framework



Data & Tools
SQL + BI



Business Context
Cross-Industry



or



Analytical Depth
Excel or Python



Continuous Growth
Learn. Build. Share.

Certification Shortlist



Google



IBM



IIBA

Your Action Plan



Choose 3–4 business-framed projects



Build with SQL + BI, expand to a second industry



Add Excel or Python and keep learning



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/fb3e08f0/public