

DATA ANALYST CAREER ROADMAP

From raw data to business decisions

Business Questions

Excel / SQL

Data Quality

Dashboards

Python

Portfolio

A practical, beginner-friendly path for career changers and early-career analysts.

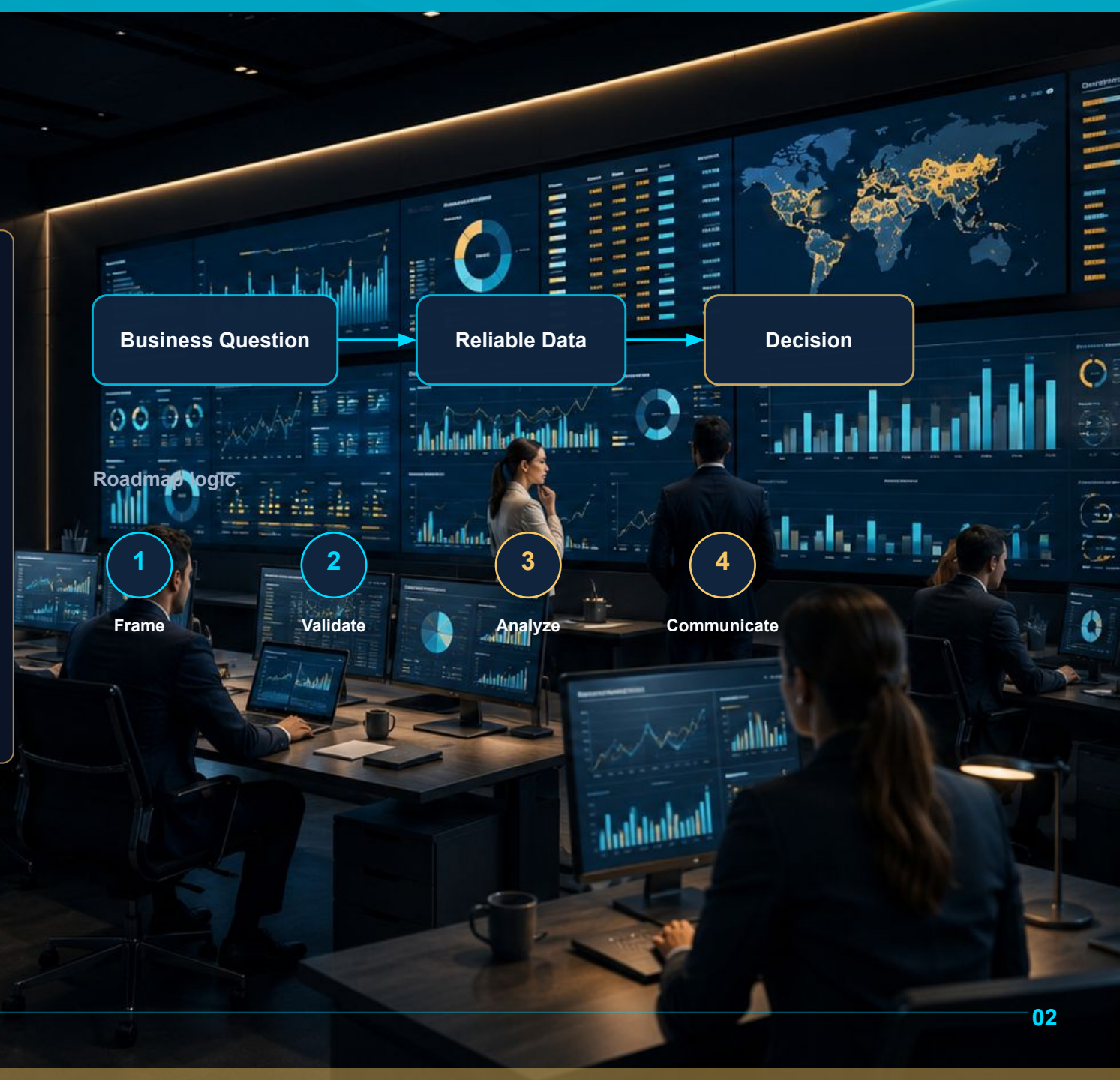
Why Data Analysis Matters

Organizations need evidence before decisions, not just charts.

Example: Online Training Company

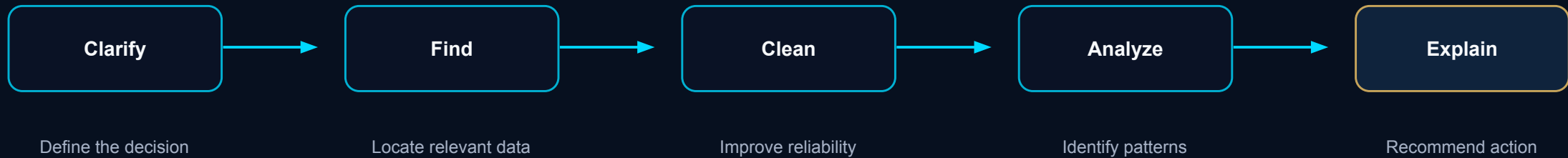
- Which courses attract the most interest?
- Where do visitors leave registration?
- Which channels generate paying students?
- Why do some classes underperform?

A data analyst connects these questions to trustworthy data and practical recommendations.



What a Data Analyst Actually Does

The role is a complete workflow, not a single tool.



Practical takeaway

A strong analyst can explain what happened, why it matters, how confident they are, and what a manager should consider doing next.

Market Context and Job Titles

Data Analyst is a broad career family; job titles vary by organization.

Common related titles

Business Intelligence Analyst

Reporting Analyst

Operations Analyst

Marketing Analyst

Product Analyst

Healthcare / Finance Analyst

Publish-safe market wording

- Use current job postings before publishing hiring claims
- Avoid unsupported salary or growth promises
- Focus on skills employers screen for: SQL, Excel, dashboards, data quality, communication
- Present Data Analyst as a practical role family, not one fixed job description

No invented job-market numbers in this deck.

Phase 1: Frame the Business Question

Start with the decision the business needs to make.

Weak question

“Why are sales poor?”

Better question

“Which products declined month-over-month, and in which customer segments did the decline occur?”

Skill to build

1

Decision

2

Stakeholder

3

Metric

4

Data source

5

Limitation

Business Metrics You Should Know

Metrics must have definitions, owners, and time periods.

Revenue

Define before reporting

Profit Margin

Define before reporting

Conversion Rate

$400 \div 10,000 \times 100 = 4\%$

Retention

Repeat customers / eligible customers

AOV

Define before reporting

CAC

Define before reporting

Cycle Time

Define before reporting

SLA

Define before reporting

Completion Rate

Define before reporting

Rule: two teams can report different numbers from the same database if the metric definition is unclear.

Phase 2: Work With Tables and Spreadsheets

Most early analysis begins by understanding rows, columns, and data structure.

Rows may represent

Customer

Transaction

Support ticket

Course registration

Appointment

Spreadsheet skills

- Sort and filter records
- Remove duplicates and blanks
- Use IF, SUMIFS, COUNTIFS, XLOOKUP
- Create pivot tables and charts
- Add data validation and conditional formatting
- Optional: Power Query for repeatable cleaning

Data Quality Before Dashboards

A dashboard built on unreliable data creates confident mistakes.



Missing values

Are important fields blank?



Duplicates

Are IDs unique where required?



Dates

Are reporting periods complete?



Labels

Are categories consistent?



Outliers

Do values violate business rules?



Definitions

Did the metric change?

Portfolio artifact: cleaning report with issue, affected records, correction, assumptions, and business questions.

Phase 3: Retrieve Data With SQL

SQL connects business questions to relational data.

Core SQL topics

SELECT / FROM / WHERE

JOINS and relationship logic

GROUP BY, HAVING, CASE

Subqueries and CTEs

Window functions and ranking

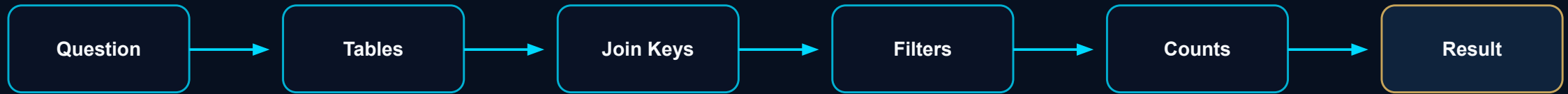
Date filters and validation

Business goal: answer workplace questions, not memorize commands.



SQL Validation Flow

A query that runs successfully can still answer the wrong question.



Validation checklist

Confirm join keys, date ranges, null handling, duplicate records, denominators, currency/units, and totals against a trusted source.

Statistics Through Business Problems

Use statistics to support decisions, not to make simple analysis look complex.

1

Describe

Mean, median, range, percentiles

2

Compare

Ratios, distributions, segments

3

Test

Confidence intervals, A/B tests

4

Question

Correlation is not causation

Example: a checkout conversion increase from 3.8% to 4.1% still needs sample size, traffic mix, and test-design context.

Visual Communication and Dashboards

A technically correct analysis fails if decision-makers cannot understand it.

Choose the chart by question

Bar: compare categories

Line: change over time

Scatter: relationships

Histogram: distribution

KPI card: key measure

Table: exact values

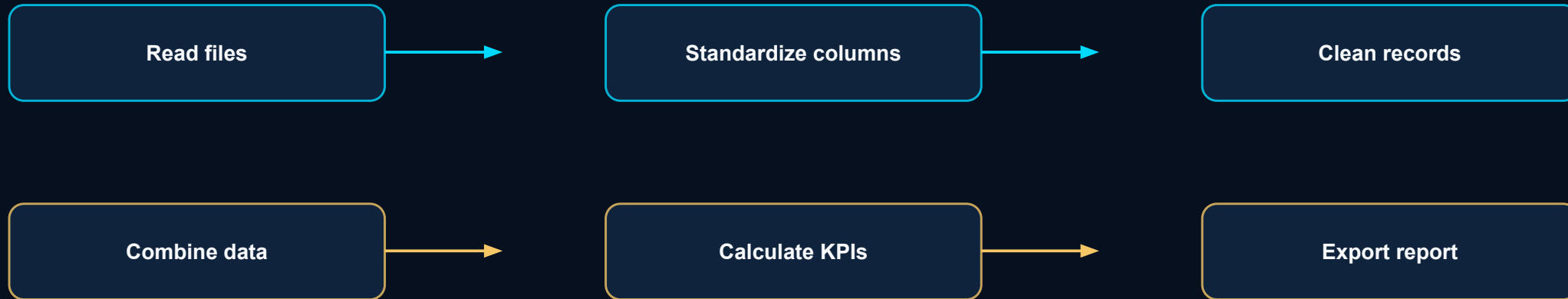
Dashboard project

- Monthly registrations
- Revenue by course
- Payment conversion
- Enrollment by state
- Lead-source performance
- Course completion and MoM changes

Every chart should answer a clear question and support a recommendation.

Phase 5: Python to Scale and Automate

Python is useful when work becomes repetitive, larger, or reproducible.



Start with variables, conditions, loops, functions, files, errors, dates — then pandas, NumPy, Matplotlib, and notebooks.

Responsible AI for Data Analysts

Use AI to accelerate work, but verify every output against the data.

AI can assist with

- Explaining formulas
- Drafting SQL queries
- Suggesting data-quality checks
- Summarizing preliminary findings
- Improving report wording

Analyst must verify

- Tables, columns, and joins
- Metric definitions and calculations
- Assumptions and missing context
- Privacy and confidentiality rules
- Whether conclusions match evidence

Do not upload sensitive business or personal data into unapproved public AI tools.

Phase 6: Build Portfolio Evidence

Fewer complete projects are stronger than many disconnected charts.



Every project should show the business problem, data source, metric definitions, quality issues, findings, limitations, and next action.

Three Portfolio Projects to Build

Demonstrate complete analytical thinking with realistic business scenarios.

1

Profitability Analysis

Revenue, costs, margins, discounts, returns

Deliverable

SQL + dashboard + executive summary

2

Customer Retention

Cohorts, repeat purchases, inactivity, channels

Deliverable

SQL/Python + visualization +
recommendations

3

Operational Performance

Tickets, appointments, registrations, delays

Deliverable

Dashboard + root-cause notes + actions

Resume and Interview Positioning

Describe what you analyzed and how it influenced a decision.

Weak statement

“Used SQL, Excel, Python, and Power BI.”

Stronger project statement

“Analyzed a fictional retail dataset, validated revenue and returns with SQL, and built a dashboard for margin review.”

Interview proof points

Business question

Data cleaning

SQL joins

Metric logic

Chart choice

Limitations

Recommendation

Flexible Learning Schedule

Measure readiness by demonstrated ability, not a fixed number of weeks.

Foundation

Business metrics + spreadsheets

Data Access

SQL on realistic databases

Reliability

Messy data + cleaning

Communication

Dashboards + findings

Automation

Python reproducibility

Career Prep

Portfolio + interviews

Goal: complete an analysis without depending on step-by-step instructions.

First 30 Days: Practical Action Plan

Start small, complete the full workflow, then increase complexity.

Week 1

Pick a business problem
and define metrics

Week 2

Build a spreadsheet
analysis with data checks

Week 3

Practice SQL questions
on a small database

Week 4

Create one dashboard
and five-minute summary

Deliverable by Day 30: a documented mini-project with data, cleaning notes, analysis, visuals, findings, and recommendations.

Final Takeaway

Data analysis is the discipline of turning information into decisions.

The analyst value chain

**Business question → Reliable data →
Appropriate analysis → Clear finding
→ Practical recommendation →
Measurable outcome**

Next step

- Start with one manageable dataset
- Complete the full analysis workflow
- Document assumptions and limitations
- Build portfolio evidence before applying
- Explore structured ITLearn360 data training

Sources note: market references should be validated with current job postings and official sources before publication.