



Quantitative Analysis & AI Comparison Goals

Core Learning Objectives



Automate Data Processing

Use AI to handle repetitive analytical tasks efficiently.



Compare AI Models

Evaluate different AI tools for specific research needs.



Learn API Integration

Understand basic API implementation for research workflows.





Automation Opportunities

Survey Analysis

Process open-ended responses and identify patterns automatically.

Table Summaries

Extract key insights from complex datasets without manual review.

Classification

Categorize large volumes of responses into meaningful groups.

AI won't replace statistical software. It will help clean data, summarize responses, suggest tests, and turn raw data into readable insights.

Summarizing Tables



Input Raw Data

Paste your table into GPT or Claude.



Ask Questions

Request common responses, highest values, or column trends.



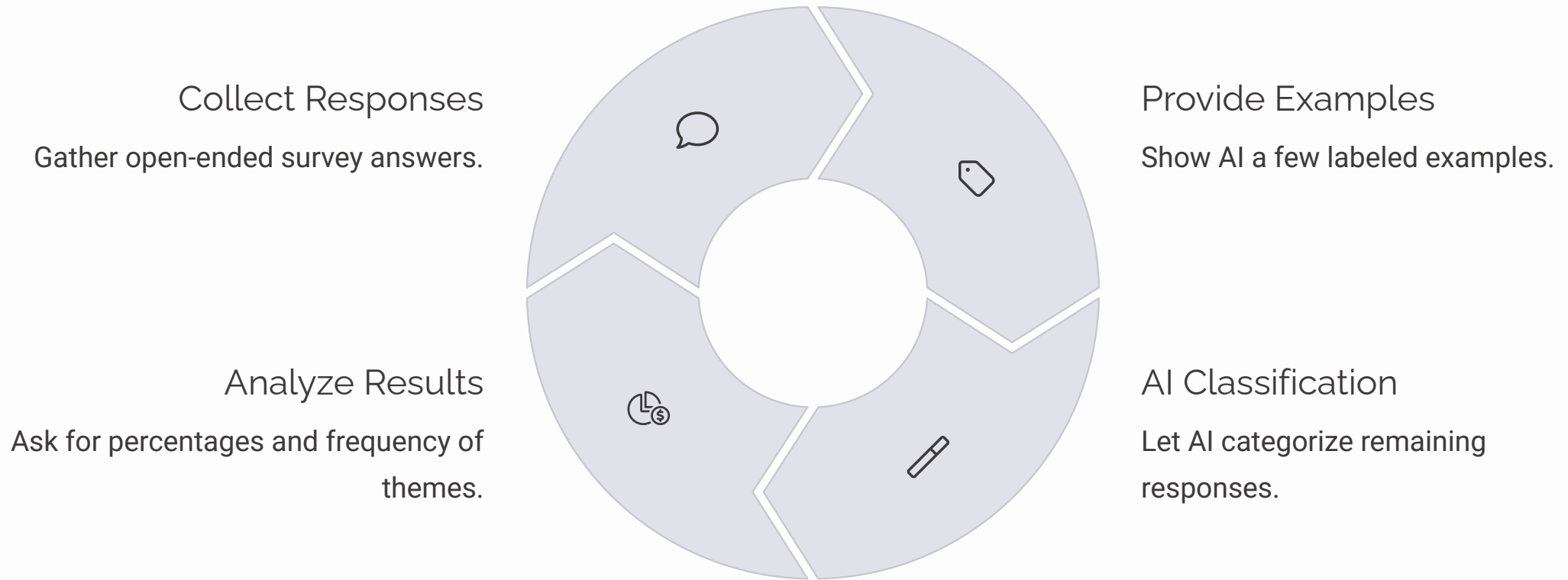
Receive Analysis

Get instant insights about your data.

This approach works well for small to medium tables. Larger datasets may require integrations or scripts.



Classifying Responses



Comparing Groups

Group A

- Response patterns
- Tone analysis
- Keyword frequency

AI Analysis

Ask the model to identify differences between groups. While AI doesn't run statistical tests yet, it can guide you toward the right ones.

Group B

- Response patterns
- Tone analysis
- Keyword frequency

Detecting Errors or Outliers



Pattern Recognition

AI identifies values that don't fit expected patterns.



Data Cleaning

AI suggests steps to normalize or correct data.



Inconsistency Highlighting

AI flags problematic entries for review.

This approach is particularly helpful when dealing with long-form or user-generated fields.



Translating Outputs



Coded Matrix

Complex numerical data in structured format.



AI Processing

Transformation with context-aware interpretation.

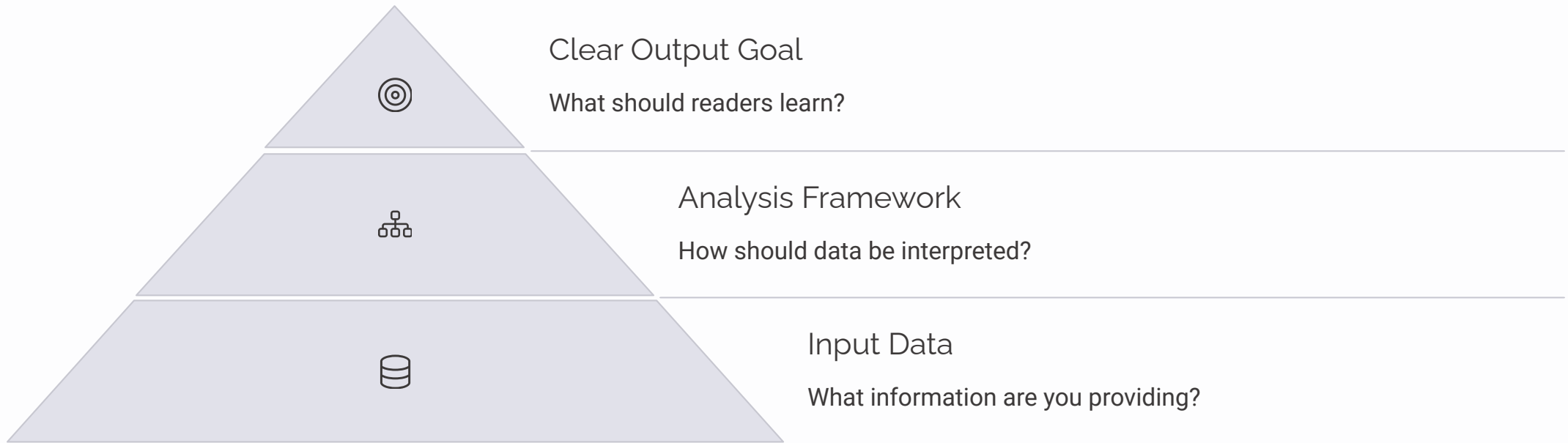


Plain Summary

Accessible narrative for non-technical stakeholders.

Example prompt: "Summarize this data in a way that a non-technical stakeholder could understand."

The Importance of Context



Key Insight: You don't need perfect data—you need clear context. The more specific your goal, the more useful the AI output becomes.

Evaluating AI Tool Performance

Not all AI tools are equal. Different models produce different outputs depending on your prompt, data, and goal.



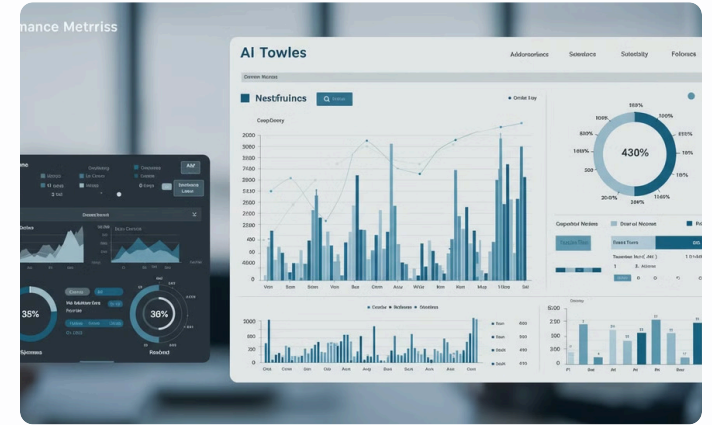
Output Comparison

AI tools can produce vastly different results from identical inputs.



Critical Evaluation

Your job is to determine which tool best fits your specific use case.



Performance Metrics

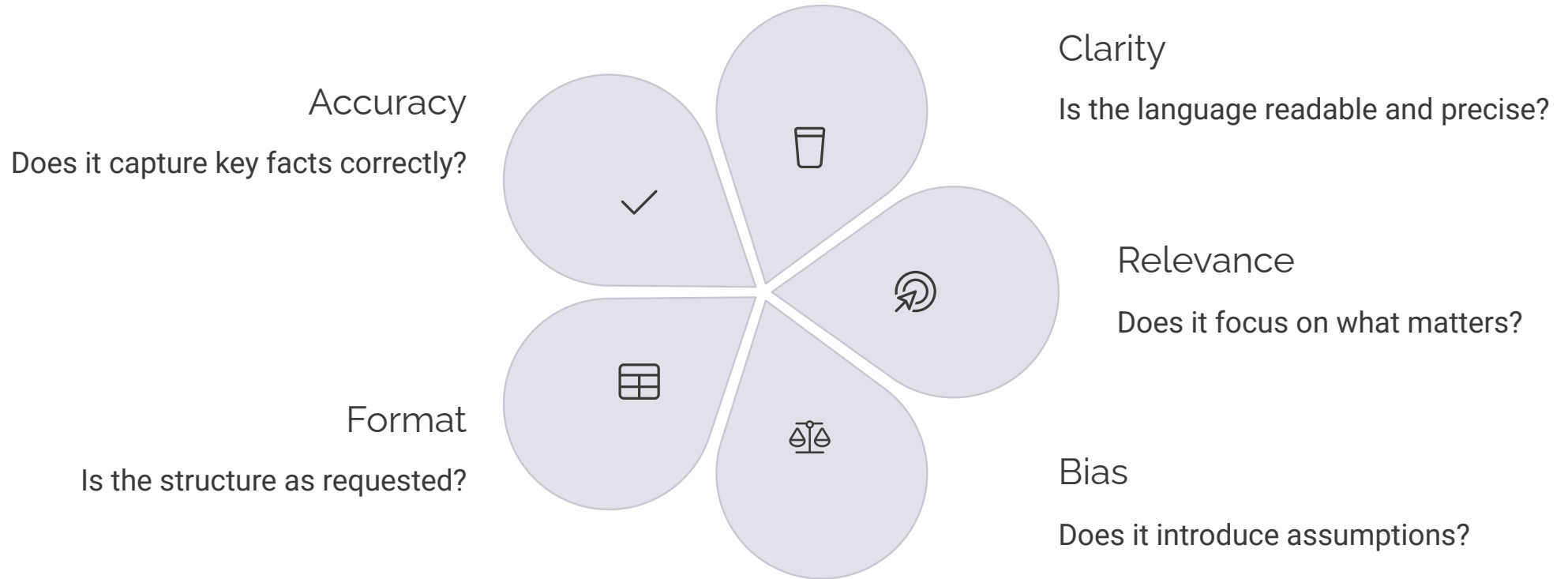
Systematic comparison reveals strengths and weaknesses of each tool.

Define the Evaluation Task

- 1 Create Clear Task**
Set a specific, replicable task for comparison.
- 2 Prepare Identical Inputs**
Use the same text or data across all tools.
- 3 Standardize Instructions**
Give identical prompts to each AI model.
- 4 Document Process**
Record your methodology for consistent evaluation.



Defining "Better" Outputs



Evaluate subjectively (expert judgment), collaboratively (peer voting), or with checklists for consistency.

Analyzing Differences & Patterns

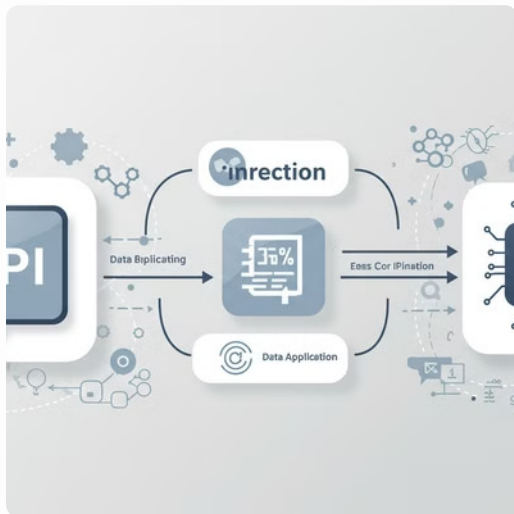
Model	Strengths	Weaknesses
Claude	Nuanced summaries	Less technical precision
GPT	Concise reporting	Occasional hallucinations
Perplexity	Up-to-date references	Variable formatting

There's no perfect tool—only the right tool for the task. Build a personal benchmark library of good outputs for future reference.



Introduction to APIs

APIs allow you to send instructions to AI models programmatically and get structured responses back.



With APIs, you can use AI at scale without clicking or copy-pasting for every item.

Anatomy of an API Call

- 1

API Key

Your authentication credential
- 2

Model Selection

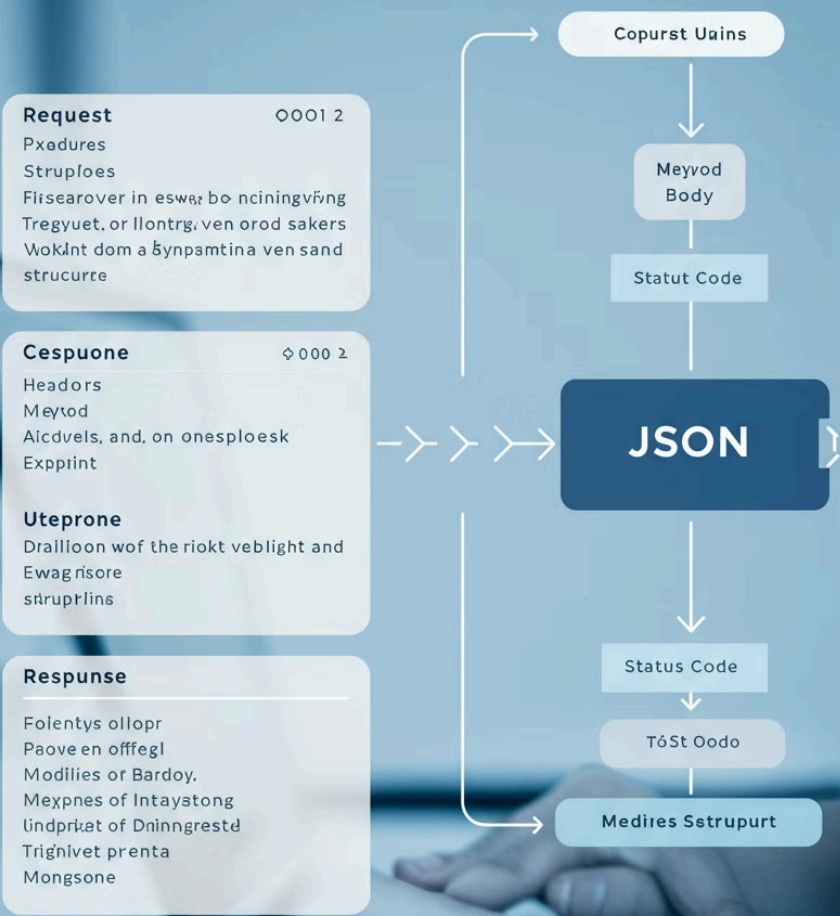
GPT-4, Claude Instant, etc.
- 3

Input Data

Your prompt or content
- 4

Parameters

Temperature, max tokens, etc.



When to Use APIs



Process Bulk Items

Handle dozens or hundreds of survey responses efficiently.



Run Repeated Prompts

Apply the same analysis across many data points.



Save Time

Automate repetitive analytical tasks.



Integration

Connect AI to spreadsheets, apps, or dashboards.

You don't need deep coding skills. Many researchers use Google Sheets, Python notebooks, or no-code platforms.



Responsible API Usage

When implementing AI APIs in your workflow, consider these key factors for effective and ethical usage:



Data Privacy

Ensure sensitive information is handled securely and in compliance with regulations.



Cost Management

Develop strategies to monitor and optimize API usage to control expenses.



Output Consistency

Implement techniques to maintain reliable and predictable results across API calls.



Rate Limitations

Be aware of request limits and design systems that respect these boundaries.

Regularly verify AI outputs to ensure accuracy and appropriateness!