

Data Visualization Tools Excel: Overview and Course Roadmap



Excel stays the default charting tool for analysts, educators, and reporting teams



Toolkit: native charts, sparklines, data bars, PivotCharts, and in-cell visuals



Version notes: waterfall, treemap, and Pareto arrived in 2016; funnel needs 2019+



Dynamic charts came with Office 2024 and Microsoft 365



Roadmap: build a cleaned chart, a combo chart, and a one-page dashboard



Shared vocabulary: series, axis, legend, plot area, data labels, chart elements



Choosing the Right Chart for Your Data

Analytical Intent	Recommended Chart Type
 Comparison	
 Trend	 
 Composition	
 Distribution	 
 Relationship	
 Running Totals	

- ✓ Match visual to intent: comparison, trend, composition, distribution, relationship
- ✓ Column/bar for categories; line/area for time; scatter for relationships
- ✓ Histogram or box plot for distribution; waterfall for running totals
- ✓ Pie only for one series, ≤ 7 non-negative, mostly non-zero categories
- ✓ Avoid 3-D charts and dual axes; they mislead more than they inform

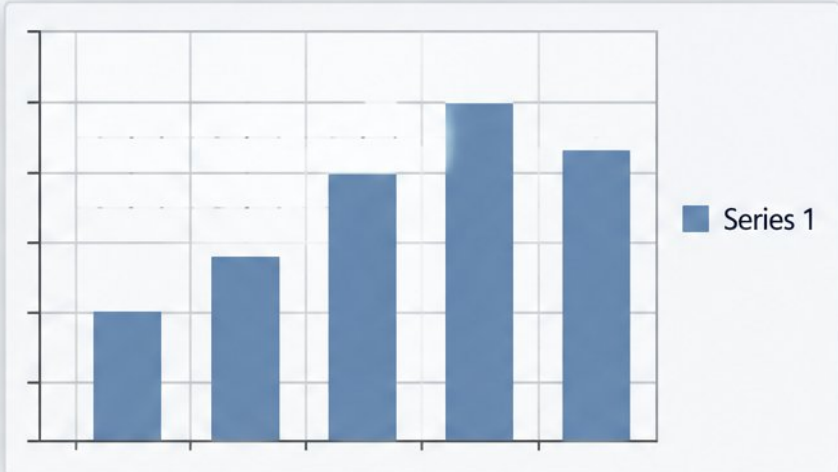
Building a First Chart: Data, Range, and Insert Steps

- Prepare clean source data: headers, consistent types, no blank rows
- Use Ctrl+T tables so chart ranges expand with new data
- Insert via Recommended Charts, All Charts, or Insert > Charts from a range
- Use Chart Elements, Chart Styles, and Chart Filters buttons to refine
- Chart Design and Format tabs control type, data, and styling
- If Excel guesses wrong, use Switch Row/Column or Select Data
- Move chart to its own sheet or anchor it inside a report



Formatting for Clarity: Titles, Axes, Labels, and Color

Before



After

Clear, Action-Oriented Title
Subtitle with units and scope



- Cut chart junk: drop unnecessary gridlines, borders, and shadows



- Write action-oriented titles; add subtitle context for units and scope



- Scale axes honestly, format numbers, and start at zero for bar charts



- Pick one: data labels, axis labels, or legend — avoid all three



- Use single-accent color; skip red/green-only encoding

Aa

- 12 pt+ sans-serif, dark text on light backgrounds, no italics

Colorblind-Safe and Accessible Chart Formatting

1

Avoid red/green, blue/purple, pink/gray, and gray/brown pairings

2

Safe defaults: blue with orange or red

3

Use a light-to-dark ladder of five verified colors

4

Cap categorical colors at five or six; add labels or patterns beyond

5

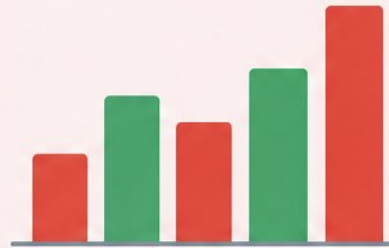
Apply via Format Data Series > Fill & Line > More Colors > Custom

6

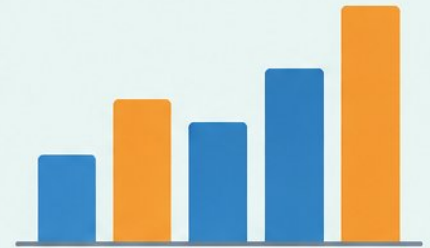
Save workbook as .xltx to reuse the palette



Avoid



Use instead



Light-to-dark ladder of five verified colors



Example palette (safe defaults)



Combo Charts, Secondary Axes, and Comparative Views



Use combo charts when volume and rate belong in one view



Clustered columns for sales; line for percent of total



Secondary axis: label it, scale it, and explain it



Dual axes can invent or hide relationships — caution required



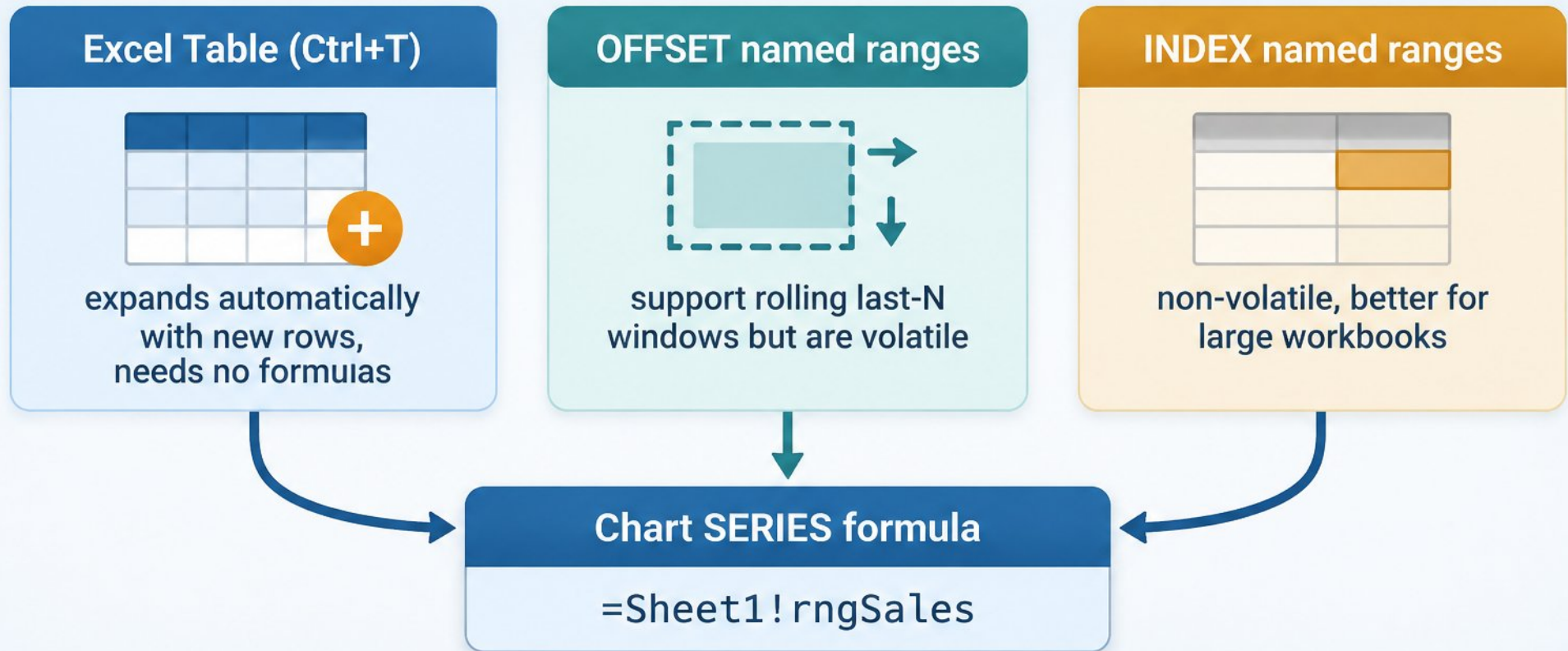
Alternatives: small multiples or indexed comparisons



Caution

Dual axes can invent or hide relationships — caution required.

Dynamic Charts with Excel Tables and Named Ranges



- 1 Excel Table (Ctrl+T): expands automatically with new rows, needs no formulas
- 2 OFFSET named ranges: support rolling last-N windows but are volatile
- 3 INDEX named ranges: non-volatile, better for large workbooks
- 4 Spill-range names with # follow FILTER, SORT, or UNIQUE results (Excel 365)
- 5 In Select Data, write the name as `=Sheet1!rngSales`; a bare name is rejected
- 6 Avoid names starting with R or C; adding columns won't add series

Charts Driven by Dynamic Arrays and FILTER

- 1 Reference spill ranges with the # operator, e.g. D7# or F2#
- 2 Build a selectable window:
`=FILTER(J24:AC24,(J24:AC24>=$F22)*(J24:AC24<=$F23),)`
- 3 Define names for labels and values, then plug into SERIES to show years
- 4 Direct dynamic-array chart links adjust as the spill grows, but stay fragile
- 5 Charts can break if rows or columns near the spill are inserted or deleted
- 6 Alternatively, build names with OFFSET or INDEX; use DROP to strip headers
- 7 Add a dynamic chart title concatenating the displayed start and end
- 8 Availability caveat: dynamic-array chart linkage is not present in every enterprise channel



SERIES

`=FILTER(J24:AC24,(J24:AC24>=$F22)*(J24:AC24<=$F23),)`



PivotCharts, Slicers, and Timelines

1

Build a PivotChart from a PivotTable: PivotTable Analyze > PivotChart; it always follows its PivotTable

2

PivotCharts stay linked when moved to a dashboard sheet

3

Insert slicers and a timeline, then use Report Connections to link every PivotTable

4

Slicers, PivotTables, and charts can live on different sheets, even hidden ones

5

PivotTables sharing a source share grouping, such as dates grouped by month

6

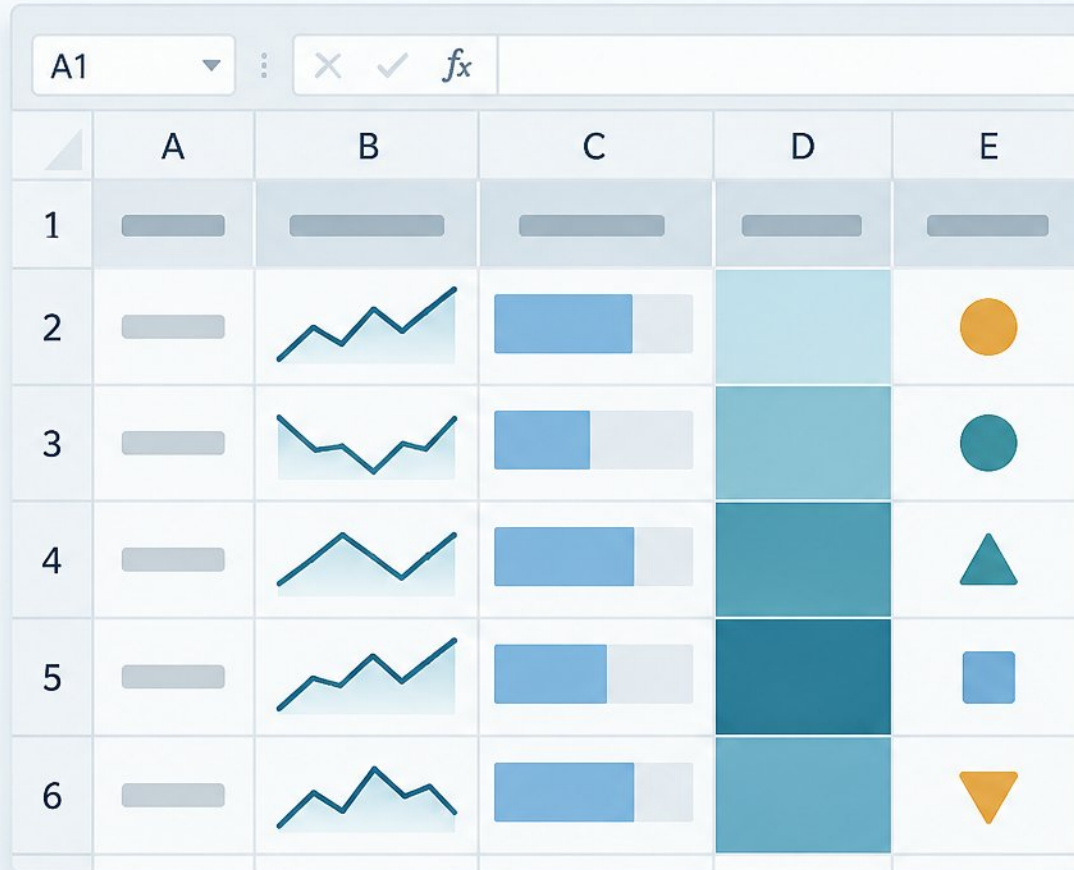
Data > Refresh All updates queries, PivotTables, and slicers together

7

Rename PivotTables and PivotCharts to keep dashboard connections manageable



Sparklines, Conditional Formatting, and In-Cell Visuals



Sparklines: compact trend context inside rows and KPI tables



Data bars, color scales, and icon sets for fast scanning



Use in-cell visuals for summaries; full charts for precise comparison



Avoid the default red-to-green scale; use single-hue sequential ramps



Add data labels or data tables so values read without color



In-cell intensity depends on range—check the min and max

Designing a One-Page Dashboard in Excel



Layout flow: title, KPI band, primary charts, supporting detail



Consistent chart sizing, grid alignment, and clean spacing



Share one PivotTable source so slicers filter every chart



Link KPI text boxes to PivotTable result cells for live numbers



Test every slicer and timeline before distributing



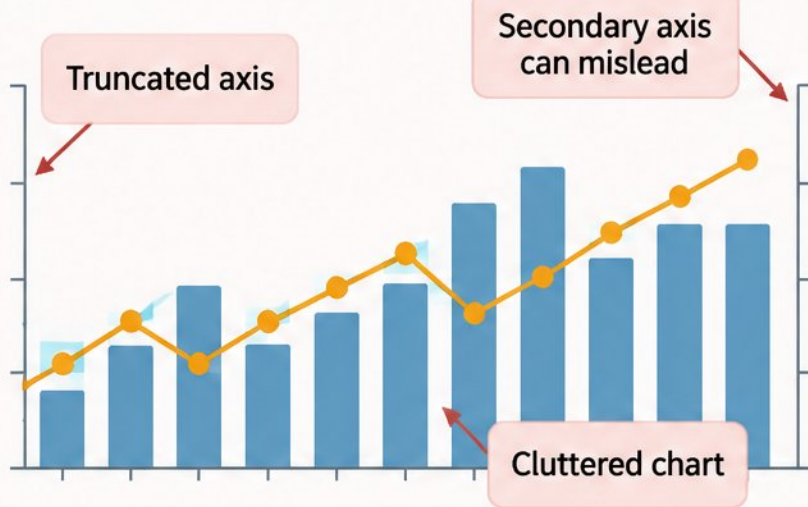
Separate data, calculations, and presentation across sheets



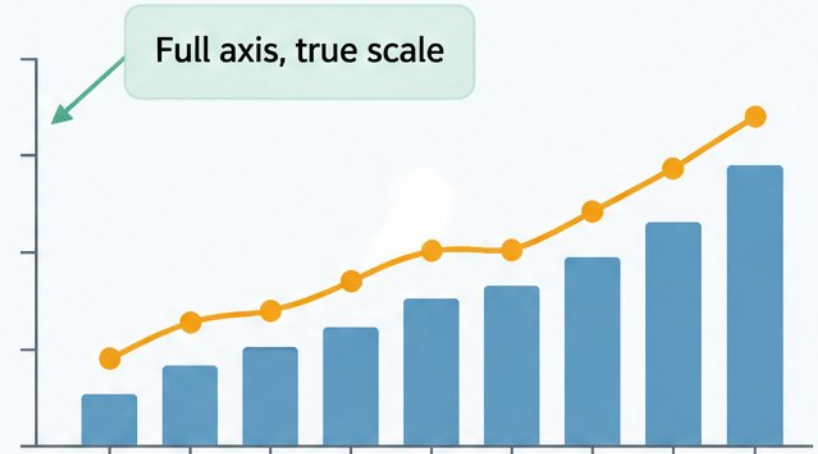
Common Pitfalls and Misleading Chart Patterns

Look for red flags that can distort the story your data tells.

! Misleading Chart



✓ Clearer, More Honest Chart



Truncated axes, distorted aspect ratios, and cherry-picked ranges



Overplotting, clutter, and inconsistent units across charts



Secondary axes that invent or hide a relationship



Aggregation and grouping choices that change the story

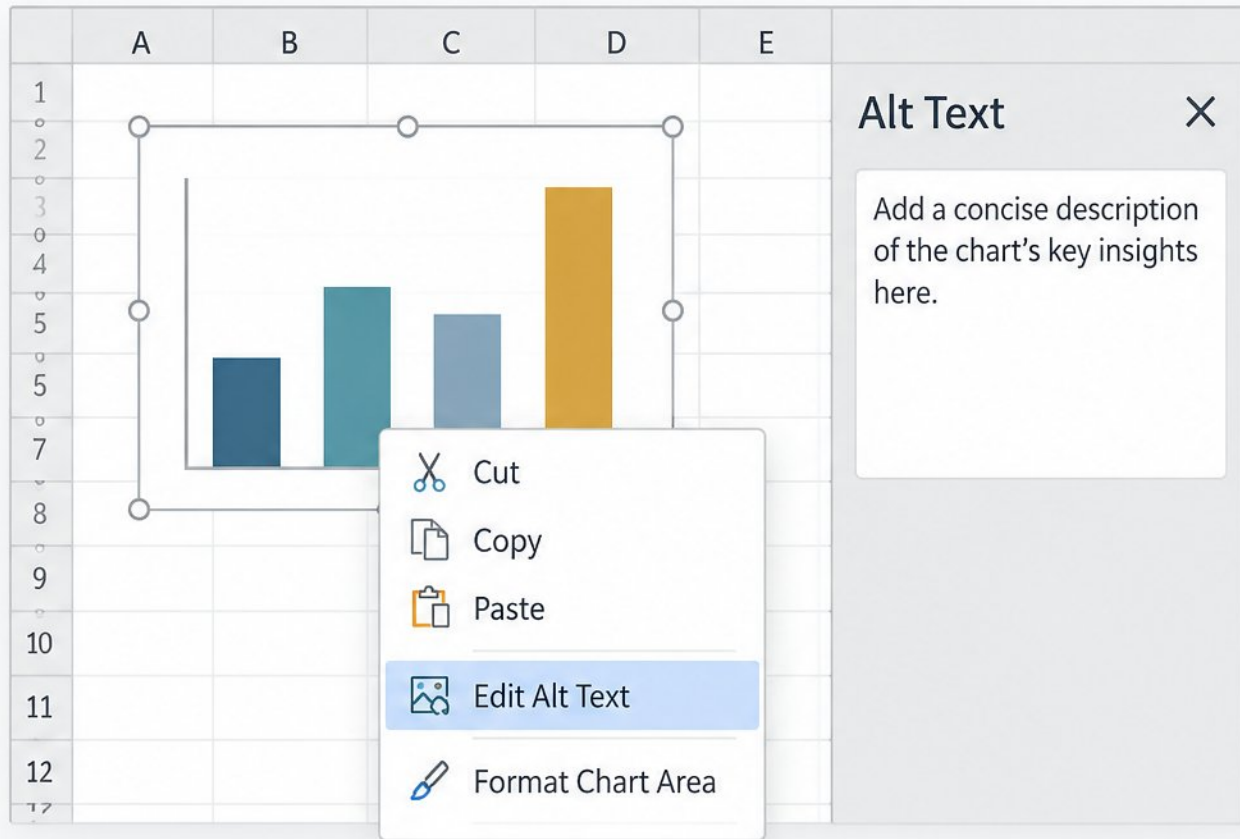


Review inherited charts for these red flags before sharing

A clearer chart leads to better decisions.



Accessibility and Data Storytelling in Excel



Make your data clear, inclusive, and impactful.

1

Add alt text to every chart: select the border, Edit Alt Text, one to two insight sentences

2

Describe the takeaway — which brand overtook another and when — not "a bar chart"

3

Use descriptive titles and axis labels; place data labels Outside End

4

Keep text sans-serif, 12 points or larger, dark on light, strong contrast

5

Run Review > Check Accessibility; mark decorative objects as decorative



Hands-On Practice and Reporting Workflow Wrap-Up



Guided exercise: clean a dataset, pick chart types, build a two-chart view



Stretch goal: add PivotCharts and slicers for a filterable one-page dashboard



Answer meeting follow-ups live with slicer clicks instead of rebuilding reports



Self-check rubric: accuracy, clarity, accessibility, and stated takeaway



Next: save, version, share reports; extend visuals with Power BI and add-ins

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/630b62a8/public