



Power Query

Tips & Tricks

- Give every step an explanatory name and merge steps of the same type, for better manageability.
- Give queries and columns user-friendly names (this is also necessary to utilize Q&A).
- Make sure that each column in each table has the correct data type. This will make the data model smaller and (as a result) faster.
- Remove the columns you are not going to use in your report.
- Maximize the use of Query Folding for faster and more efficient queries. With Query Folding, multiple transformations are merged as one query and then sent to the source. If 'View Native Query' is not available, Query Folding has stopped before that step.
- Structure your queries in folders. For example: Facts, Dimensions, Functions, Misc.
- You can copy/export the complete M code of your Power Queries by selecting and copying one or more queries and paste them in your favorite text-editor (e.g. Notepad++). Dependencies will be included as well (parameters/queries/functions).
- You can copy and paste Queries easily between files. Dependencies will be included (parameters/queries/functions), and Data Sources will be automatically listed.
- Turn off 'Enable Load' for queries/tables that you don't need in the Data Model.
- Prefer "reference" over "duplicate" of a query.
- Turn on the Formula Bar so you get familiar with Power Query (M) code. M is an easy way to quickly make small adjustments.
- In general, prefer "Import" over "DirectQuery". Unless the amount of data is too large to import, or when there are other requirements (like real-time insights).
- Transform your data by using Python and R in the Power BI Query Editor.

Code examples (don't forget that Power Query / M is case-sensitive!)

- **if** T > 0 **then** A **else** B
- **try** A/B **otherwise** 0
- **#table**({ "X", "Y" }, { { 1, 2 }, { 3, 4 } })
- **DateTime.LocalNow()**
- **Date.From**(DateTime.LocalNow())
- **Excel.Workbook**(Web.Contents("[url]/[filename].xlsx"), null, true)

Resources

- Power Query M Formula Reference: <http://bit.ly/PQMReference>.
- Notepad++ Power Query support by Lars Schreiber: <http://bit.ly/PQinNotepad>.

Data Model

Tips & Tricks

- Always use a separate Date table in your data model. Mark it as a Date Table.
- Only use DAX Calculated Columns when it's not possible to create it using Power Query. This improves clarity and manageability of your report as transformations are located where you expect them.
- Hide columns that are needed but are irrelevant for the user. Quick Tip: use Relationships view to hide multiple columns: use SHIFT + DOWN ARROW for selection of columns ▶ SHIFT + F10 for menu ▶ Hide.
- Hide the key at the many side of a many-to-one relation (e.g. [OrderDate] in Revenue table).
- Don't use report/page/visual level filters to secure your data, as users can change filter values!
- For each measure column in your data model, make a DAX Calculated Measure instead of using the 'Default Summarization', then hide the original column. This way all measures will have the same icon. And it enables you to easily change the calculation in the future (e.g. adding a filter condition). Also, it is easier to reference this measure in other DAX calculations.
- Always use the table name when you refer to a column, for example: 'Product'[Category].
- Use DIVIDE() to prevent division by 0, and to improve the speed of your divisions.
- Give measures a prefix (% , # , €).
- Use standard abbreviations like YTD, LY, PY, PP as suffix, to keep the base fields together.
- In DAX: (un)comment DAX lines by pressing Alt + Shift + A or CTRL + / , and Shift + Enter for line breaks.

Code examples

- **CALCULATE**([Sales], Channel[Channel Name] = "STORE")
- **SUMX**(Orders, Orders[Price] * Orders[Quantity])
- **DIVIDE** ([Profit], [Total Sales])
- **TOTALYTD** ([Total Sales], 'Date'[Date])
- **IF** ('Date'[Date] > TODAY(), BLANK(), [Total Sales])
- **VAR** Sales = SUM([SalesAmount])
VAR SalesLastYear = CALCULATE (SUM([SalesAmount]), SAMEPERIODLASTYEAR ('Calendar'[Date]))
RETURN
IF (Sales, DIVIDE (Sales - SalesLastYear, Sales))

Resources

- Increase the readability of your DAX calculations: <https://www.daxformatter.com>.
- Practical DAX use cases, with incredible explanations: <https://www.daxpatterns.com>.
- Use DAX Studio to analyze and tune your calculations: <http://daxstudio.org>.
- Find all about DAX expressions: <https://dax.guide>.

Data Visualization

Tips & Tricks

Themes & Colors

- Use a theme file (.json) with the colors of your organization.
- Use a Power BI Template file (.pbit), to bring consistency in the look & feel of reports in your organization (e.g. add a default background, add common data sources).
- Don't use noisy images as a background. They distract from the data.
- Apply colors with a purpose and not because it looks fancy. Consider the interpretation of colors (for example: red is usually associated with a negative situation, green with a positive situation).
- Think about colorblindness (8% of male, 0.6% of women have red-green color blindness).

Report layout

- Put filters on a consistent place on each page for user friendliness and recognition.
- Show the last refresh date of the data model in your report.
- Align graphs and objects. You can use the 'snap to grid' option.
- Check if you have given graphs, objects, pages and the whole report a clear and explanatory title, this will show up in the selection pane (Even if you don't show the title).
- Use the ▲ and ▼ buttons on the Selection Pane, to change the display order of visuals.
- Use drillthrough and tooltip pages to add extra context. Hide drillthrough and tooltip pages from your navigation bar. Give the 'back button' extra accent for a clear report navigation.
- Avoid the use of report/page/visual level filters. The Filter Pane is collapsed by default (hidden).
- Disable visual header for a clean look-and-feel and drill up/down using right click.

Graphs & Visuals

- Prefer graphs over tables for better insights. When you do use tables, apply conditional formatting.
- Think about using relative date filters, such as "Last Month" or "Rolling Year".
- Try to limit the use of decimals.
- When using custom visuals, test the impact on performance of your report. Also check when it was last updated by the developer.
- Check and improve all 'visual interactions'. Prefer cross-filtering over cross-highlighting.

Resources

- Power BI theme generator: <https://powerbi.tips/tools/advanced-color-theme-generator>.
- Hichert, visualization standards: <https://www.hichert.com/resources>.
- Visuals-picker: <http://extremepresentation.typepad.com/files/choosing-a-good-chart-09.pdf>.
- OK VIZ Visual reference: <https://sqlbi.com/ref/power-bi-visuals-reference>.

Miscellaneous

Tips & Tricks

- Edit your report in Power BI Desktop and not in the Service. Making sure there is one golden version.
- The best way to share your Power BI solution with others is using Apps. Prefer to use Security Groups.
- Use a multiple-file-strategy: one file with the Power Queries and Data Model; connect from one or more other files to this data model in the Power BI Service and visualize your reports.
Note: all files must be in a single Workspace, a restriction that probably will be removed in the future.
- Make sure you are having versioning for your Power BI Desktop files (local OneDrive sync works well).
- Be careful with Publish to Web. Only use this function when all your data can be out in the open. Assume that your data will be publicly available!
- Be aware that users can also access your data model through the Q&A, Quick Insights and Analyze in Excel functions. That's great, but think about data protection using (dynamic) row level security.
- Use the Power BI admin API to get an overview of Power BI content within your tenant and monitor content usage by using the Power BI Audit logs.
- Be aware of possible issues in case of strange behavior and check the Power BI support page: <https://powerbi.microsoft.com/en-us/support>.
- Interested in taking the Power BI exam (70-778)? Check out: <https://bit.ly/ExamPowerBI>.

Resources

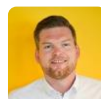
- Follow these Power BI product team members: Amanda Cofsky, Arun Ulag, GuyInACube (Adam & Patrick), Charles Sterling, Christian Wade, Josh Kaplan, Kasper de Jonge, Kay Unkroth, Kim Manis, Lukasz Pawlowski, Matt Mason, Matthew Roche, Miguel Martinez, Nikhil Gaekwad, Nimrod Shalit, Will Thompson.
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- Follow these sites: <https://www.sqlbi.com>, <https://powerbi.tips>, <https://guyinacube.com>, <https://radacad.com>.

Feedback & Support

Contact us for Power BI consultancy, training and off-the-shelf content! For example, our Power BI end-to-end Monitoring Solution, or our proven Power BI implementation approach. Email us at powerbi@macaw.nl.

Do have suggestions or questions regarding the Power BI Cheat Sheet? We'd love to hear from you!

Send your feedback to us at: powerbi@macaw.nl.



Dave Ruijter
[linkedin.com/in/daveruijter](https://www.linkedin.com/in/daveruijter)
twitter.com/daveruijter



Marc Lelijveld
[linkedin.com/in/marclelijveld](https://www.linkedin.com/in/marclelijveld)
twitter.com/marclelijveld