Power query VS. SQL

Power Query is an ETL tool created by Microsoft for data extraction, loading and transformation, and is used to retrieve data from sources, process it, and load them into one or more target systems. Power Query is available in several variations within the Microsoft Power Platform, and is used for business intelligence on fully or partially self-service platforms. It is found in software such as Excel, Power BI, Analysis Services, Dataverse,[1] Power Apps, Azure Data Factory, SSIS, Dynamics 365, and in cloud services such as Microsoft Dataflows,[2] including Power BI Dataflow used with the online Power BI Service or the somewhat more generic version of Microsoft Dataflow used with Power Automate.

ETL is closely related to data modeling,[3] and for transformation, Power Query can be used to develop a logical data model in those cases where the data does not already have one, or where there is a need to further develop the data model.

Divide work into 3 phases :

* Getting data
* Transforming and cleaning data
* Loading data

In first phase we connect power query with files in different types(excel files , text files, databases ,etc..) after that it import original data from the indicated source.

In second phase user give steps you need to power query to follow to analyze and ger optimal result

In third phase user tell power query the wanted shape(pivot table , pivot chart , table)

The major advantage of Power Query in excel is that it is a fast and efficient way of working on large datasets. Besides, it is reusable as the same query can be used again on a new dataset. Moreover, with just a few clicks, one can have access to cleansed and sorted data.

Power Query can be installed as an add-in in Excel

2010 and 2013. In Excel 2016 and the subsequent versions, Power Query is a built-in excel feature. It can be accessed from the “get data” drop-down (in the “get and transform data” group) of the Data tab of Excel.

two major database software tools: Power Query and SQL

|  | **SQL** | **Power Query** |
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| **Learning Curve** | Medium. Requires understanding of tables, queries and data. | Requires understanding of Power BI and its outcomes. |
| **Dependency** | Requires database server and data-lake. | Requires external data sources. |
| **User Base** | Large developer community, database admin community. | Specific to the Power BI community. |
| **Programming Support** | SQL is the query language and also supported by other external languages. | It can be custom coded and extended with M language. |
| **Data Operations** | You can perform CREATE, READ, UPDATE and DELETE. | You can perform data transformations on already processed data. |
| **Custom Code** | You can custom code stored procedures and routines to automate. | You can write custom code using the power query to perform specific tasks. |
| **Data Source** | Database Server | Various data sources (files, services, database) etc. |
| **External Dependency** | SQL requires a lot of tools for you for reporting, visualization, query and storage. | Power query is specific to a tool so it is already dependent on single tool. |
| **Permissions** | Every step of the way you would require permission to access the data. | You take permission only when you are working on the data. |
| **Infrastructure** | Large and requires much understanding of data and database. | Limited to the tool. |
| **Refresh Times** | Initially slow, once cached lot easier. | Lot quicker as data is specifically queried by the tool. |
| **Shared Datasets** | You can share the data, reports and other queries using tools. | You share what you are using as a data source. You have limited access. |

**Power Query: Advantages and Disadvantages**

Power Query is a data preparation engine run by the Power BI tool. This engine allows the tool to transform the data and also connect the data with the various data sources out there. e.g. MySQL, CSV Files, Snowflake, etc.

Power Query allows you to connect with various sources that are out there—for example, files, databases, services, feeds, data lakes, etc. With it you can connect your desktop and a cloud service with all of those available data sources.

Some of the data sources may require external connectors. These connectors understand what it takes to connect the available data source with the Power BI tool, which makes it easier to process the data further and transform it as required.

Once the data is taken into the tool, further manipulation using the query, transformation and the manipulation becomes easier. You set up a recurring process for accessing the data, transforming it, which is a part of the tool and the engine in general.

**Limitations**

You can't use parameters passing while working with big data.

Limited cells that can be previewed.

Limited data size processed in buffer (tool limitation).

Performance issues

SQL: Advantages and Disadvantages

SQL is a standardized programming language that makes it easier for you to design, process and manipulate data from the database server. You can literally do anything you want with the data and also get much quicker and faster performance from your queries.

It's lot faster in terms of performance than Power Query. It's transformations are lot quicker than the Power Query.

Reporting with SQL can be done per database basis. Each of them have different tools and methods to accomplish the much better report performance. SQL is lot better in this regard—be it auto reporting or machine learning based reports.

SQL can be used with many other external tools, which makes it easy for you to do analysis. There are, however, some database engines that lack the tools specific to the analysis and the predictive nature of the data. For that you'd find third-party external tools, which makes the use of the Power BI more useful over traditional SQL query.

Limitations

Steep learning curve of SQL language.

Simplicity of single tool like Power BI for use case.

Not suitable for less technically inclined users.

Requires external libraries and engines for predictive and prescriptive analysis.