Data Visualization Software: Recommendation Report

As data is now critical for business decisions, data analysts need the best tools to turn raw datasets into meaningful insights. Data visualization software helps bridge the gap between experienced analysts and executives in analyzing data. This document will compare Power BI and Tableau and determine which is more suitable for business intelligence.

Background Information

Data visualization software is used to create interactive reports where each dashboard, or page, holds different visuals and calculations. Data visualization software is designed to simplify data analysis compared to tools with steeper learning curves like programming languages. However, they often provide the ability to integrate programming.

Power BI and Tableau are the top competitors in data visualization software. Power BI is owned by Microsoft and offers Power BI Desktop to create reports, while Power BI Service is a website for editing and viewing existing reports. Tableau is owned by Salesforce and has Tableau Desktop for creating reports. Both provide a variety of data sources to connect to and features for advanced analysis like machine learning.

Requirements:

The following are the defined requirements for comparing Power BI and Tableau:

- **Cost:** Which program offers more affordable paid tiers or a free version?
- **Accessibility:** Which program is more user-friendly and available, regardless of skill level or device?
- **Report Design:** Which program is easier and more appealing for report design?
- **Performance:** Which program is better at processing and refreshing small and large datasets?
- **Programming Support:** Which program provides more support for programming and query languages?

Note to Instructor: This recommendation report is intended for aspiring or experienced data analysts and business users looking to compare PowerBI and Tableau. To accommodate beginner analysts and executives deciding what to purchase, this guide does not require previous experience or knowledge of data analytics concepts like dashboards and machine learning.

Comparisons

This section will compare Power BI and Tableau using the previously defined requirements.

Cost

The free version of Power BI is available through the Power BI service, the Microsoft website, and the Microsoft store. Though abundant in features for descriptive analysis, the free version provides limited support for machine learning and other predictive analysis.

There are three paid tiers for Power BI [1]:

1. **Power BI Pro:** $9.99 per user/month individual license. Also included under Microsoft 365's E5 license.
2. **Power BI Premium – Individual:** $20 per user/month individual license with advanced AI, data management, and other enterprise-level features.
3. **Power BI Premium – Organization:** $4995 per capacity/month organization license.

Tableau Public is Tableau's free version that resembles Tableau Desktop. As the name suggests, Tableau Public automatically uploads your dashboard to your public Tableau web portal with each save.

Like PowerBI, Tableau offers three paid tiers with individual or organizational options [2]:

1. **Tableau Viewer:** $15 per user/month to view existing dashboards.
2. **Tableau Explorer:** $42 per user/month to edit existing dashboards.
3. **Tableau Creator:** $70 per user/month to create, build, and publish dashboards.

Both PowerBI Pro and Individual Premium are significantly cheaper than Tableau Creator. While executives looking to view existing dashboards may find the cost of Tableau Viewer reasonable, PowerBI Pro is still cheaper.

Accessibility

While the Power BI service is on the web and thus available to anyone with a web browser, Power BI Desktop is only available through the Windows operating system. A Power BI app is available on iOS and Android but only for viewing reports. PowerBI is easy to learn, with a user-friendly interface reminiscent of other Microsoft Office programs.

Tableau Desktop is available across Windows, Mac, and Linux. Tableau Mobile is their mobile app for viewing reports. While also relatively easy to learn, Tableau has a much higher learning curve due to its less friendly or familiar interface.

Power BI slightly edges out Tableau when trying to appeal to both data analysts and business users. Power BI is easier to learn and still available across all devices through the web or desktop.

Report Design

Power BI offers many visuals like bar charts, KPIs, pie charts, and integrated ArcGIS maps for geospatial data. You can add visuals to your report by clicking an option in the **Visualizations** panel on the right side. The **Format Visual** tab with different style settings. Visuals are easy to move and resize on the report. Power BI doesn't provide layout options and isn't the best at helping align visuals, making them awkward to arrange.

In Tableau, each visual is created and edited in its own separate sheet to place later on a dashboard. Dashboards have superior alignment and layout settings, including responsive layouts that change to fit different devices and screen sizes. However, many options, filters, and style settings are hidden in menus that are harder to configure and understand for new users.

In terms of designing reports, Power BI and Tableau both have their pros and cons. Deciding which one to use will thus depend on personal preference and level of comfort with the user interface.

Performance

Power BI is faster than Tableau when handling small volumes of data and can automatically refresh the report whenever a data source is updated. However, the performance significantly worsens as the volume of data increases.

Tableau, meanwhile, supports large volumes of data with excellent performance. However, Tableau is more manual when refreshing data. Regardless, Tableau is the safest choice for businesses that may process datasets of various sizes.

Programming Support

DAX and M are two languages created for and built into Power BI. **DAX** is a formula language for generating calculations, while **M** is a query language for transforming and filtering datasets. As for other languages, you can use **Script Visuals** to create visuals from R and Python scripts. You can also execute SQL queries on connected servers.

Tableau has more extensive programming support and developer tools [3]. **MDX** is Tableau's equivalent to DAX and is for making calculated fields. Tableau can connect to statistical files in R, SAS, and SPSS, and provides extensions and frameworks like **TabPy** that enable data cleaning inside Tableau using Python.

Conclusions

The following are the conclusions summarized for each requirement:

- Both Power BI and Tableau offer free tiers, but Power BI has cheaper paid tiers with additional access to other Microsoft Office products under the 365 license.
- Power BI has a simpler interface and an easier learning curve, but Tableau is more available across non-Windows platforms.
- Power BI and Tableau both offer a diverse range of visuals and style settings but fall short in either layout, alignment, or usability.
- Tableau is faster in performance, especially for processing large volumes of data.
- Tableau provides more support for Python, R, SQL, and other built-in languages.
- Tableau has better performance and programming support but is far more expensive and has a higher learning curve.
- Power BI is much cheaper and is easy to use, but has awkward report design alignment and performance worsens as the volume of data increases.
- The best option for data visualization software depends on the use case, as Power BI is better for business users under the Microsoft ecosystem, while Tableau is better for experienced analysts handling large datasets.

Recommendation

The answer as to whether Power BI or Tableau is the preferred data visualization software for business intelligence depends on the use case. Power BI is recommended for beginners and business users more comfortable with the Microsoft ecosystem, especially when working with smaller datasets. Tableau is best for experienced analysts working with large volumes of data and more complex analyses and tools.

Information Sources

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