Business Analytics Solution Recommendation for Best Bike Ever (BBE)

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Contents

Executive Summary

This report was commissioned to investigate and recommend an optimal data/business analytics solution for Best Bike Ever (BBE), focusing on developing a dashboard solution accessible to the company's managers and staff. Four platforms—PowerBI, Tableau, Qlik Sense, and an in-house development using Python—were critically assessed to identify the most suitable solution. These platforms were evaluated based on established criteria derived from reputable sources, including Gartner Research and the Information Systems Education Journal, focusing on user-friendliness, analytical depth, rapid development, scalability, and integration capabilities.

Following a meticulous analysis, Tableau is recommended as BBE's most suitable business intelligence solution. Tableau stood out for its user-friendly interface, rapid and intuitive dashboard creation capabilities, robust analytical depth, extensive support and community, and easy learning curve, all aligning with BBE's objectives and needs. If implemented effectively with adequate training and support, this recommendation can help BBE leverage data-driven insights to optimise decision-making, enhance operational efficiency, and achieve sustained business growth.

Criteria for Analysis

Evaluating Business Intelligence and Business Analytics software is vital to select the most suitable solution, allowing organisations to make informed decisions. Various reliable sources have been integrated to form a comprehensive set of evaluation criteria to ensure a well-rounded and informed analysis. Below are the combined criteria derived from these sources:

1. Ease of Use

The software should be user-friendly, requiring minimal training, allowing users to easily access, analyse, and visualise data (Davis & Woratschek, 2015).

2. Customisation and Flexibility

The software should offer extensive customisation options to allow the tailoring of dashboards and reports to the organisation's specific needs (Amara, Solberg Søilen, & Vriens, 2012).

3. Integration Capabilities

The ability of the software to seamlessly integrate with various data sources and other enterprise systems is crucial for efficient data management and analysis (Gartner Research, 2022).

4. Scalability and Performance

It's imperative that the chosen software can handle growing data volumes and user loads without compromising performance (Amara, Solberg Søilen, & Vriens, 2012).

5. Support and Community

A strong support network and active community are crucial for resolving issues, learning best practices, and ensuring the long-term viability of the solution (Davis & Woratschek, 2015).

6. Cost Effectiveness

The cost of implementing and maintaining the software should be weighed against the value it brings to the organisation (Amara, Solberg Søilen, & Vriens, 2012).

7. Analytical Capability and Depth

The software should support diverse analytical methods and provide deep insights, empowering organisations to make well-informed decisions (Gartner Research, 2022).

8. Security and Compliance

Given the sensitive nature of business data, robust security measures and compliance with relevant regulations are non-negotiable (Amara, Solberg Søilen, & Vriens, 2012).

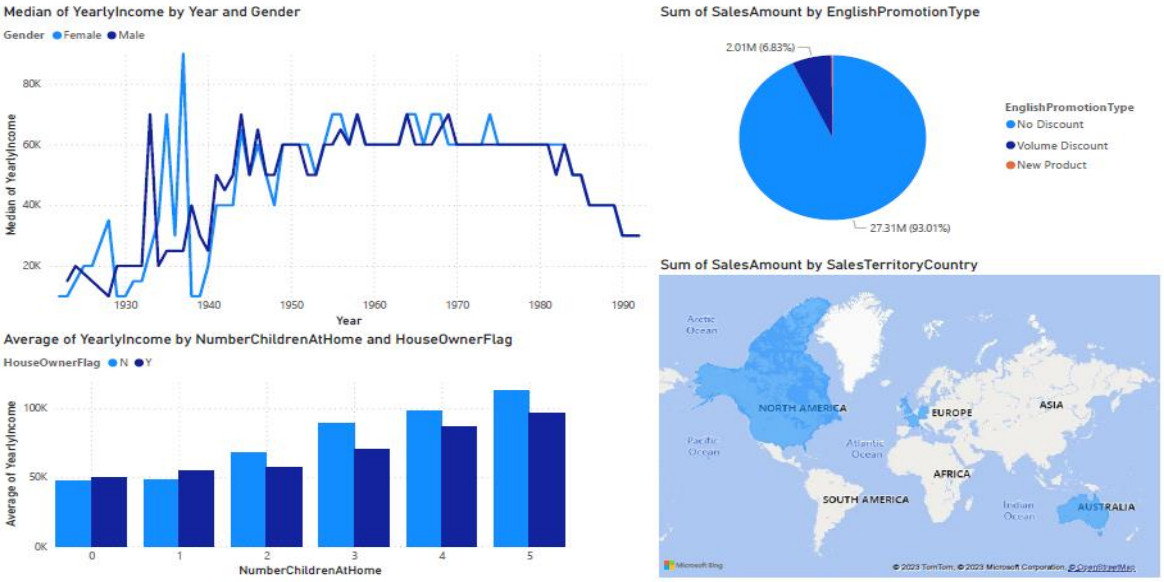
PowerBI

Microsoft PowerBI is a robust business analytics tool that facilitates the conversion of data streams from different sources into coherent, visually immersive, and interactive insights. It is known for its extensive integration capabilities, easy-to-use interface, and advanced analytics features.

Analysis based on Criteria:

1. **Ease of Use:** PowerBI offers a highly intuitive interface, allowing users to create reports and dashboards with minimal learning curve, even for non-technical users. The drag-and-drop feature enhances user experience, enabling quick and efficient dashboard creation. The available online resources and documentation further facilitate user learning and adaptation. (Figure 1)

Figure 1: BBE Analysis(PowerBI)



2. **Customisation and Flexibility:** It provides extensive customisation options, allowing users to design reports and dashboards tailored to their specific needs, offering a variety of visualisation templates and the ability to create custom visuals.
3. **Integration Capabilities:** PowerBI stands out for its seamless integration with many data sources, including Excel, Azure, and other Microsoft products and third-party apps. It supports real-time data streaming and automatic data refresh to keep insights current. (Figure 2)
4. **Scalability and Performance:** As a cloud-based tool, PowerBI scales easily to accommodate growing data volumes and user loads, maintaining high performance even with extensive datasets.
5. **Support and Community:** PowerBI has extensive support from Microsoft and a large, active community of users and experts, which can be invaluable for troubleshooting and learning new techniques and best practices.

Figure 2: Data relationship(PowerBI)

6. **Cost Effectiveness:** PowerBI offers competitive pricing structures and provides significant value, especially for organisations already invested in the Microsoft ecosystem. Its pricing is transparent and scales well with organisational needs.
7. **Analytical Capability and Depth:** PowerBI's advanced analytical capabilities, including AI-powered insights, natural language query, and robust data modelling, empower organisations to delve deep into their data and extract meaningful insights.
8. **Security and Compliance**: It ensures data security with robust access controls and compliance with various industry regulations and standards, making it a suitable choice for organisations with stringent security and compliance requirements.

Conclusion:

PowerBI emerges as a comprehensive solution, blending ease of use with advanced analytical capabilities, extensive integration, and customisation options. Its scalability and robust security measures make it suitable for organisations of all sizes and sectors. The supportive community and vast resources further enrich user experience and learning, making it a strong contender in the Business Intelligence market.

Consideration for BBE:

For Best Bike Ever (BBE), PowerBI can offer a dynamic, user-friendly, and secure platform to visualise and analyse data, aiding in enhanced decision-making. Its compatibility with diverse data sources and advanced analytical features can help BBE derive deep insights from its sales, marketing, and HR data, ultimately contributing to increased profitability and performance.

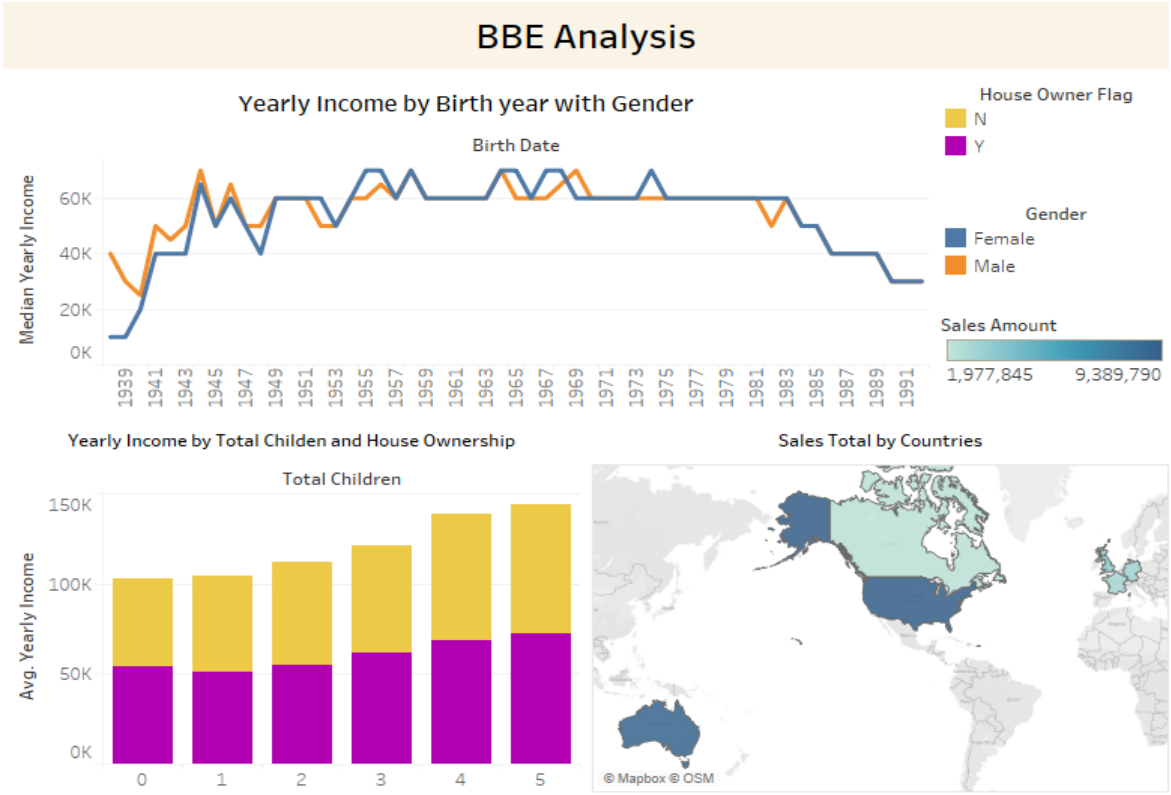
Tableau

Tableau is a widely recognised business intelligence and data visualisation tool known for its powerful and intuitive analytics capabilities. It excels in transforming raw, unstructured data into interactive and shareable dashboards, providing insightful and actionable business information.

Analysis based on Criteria:

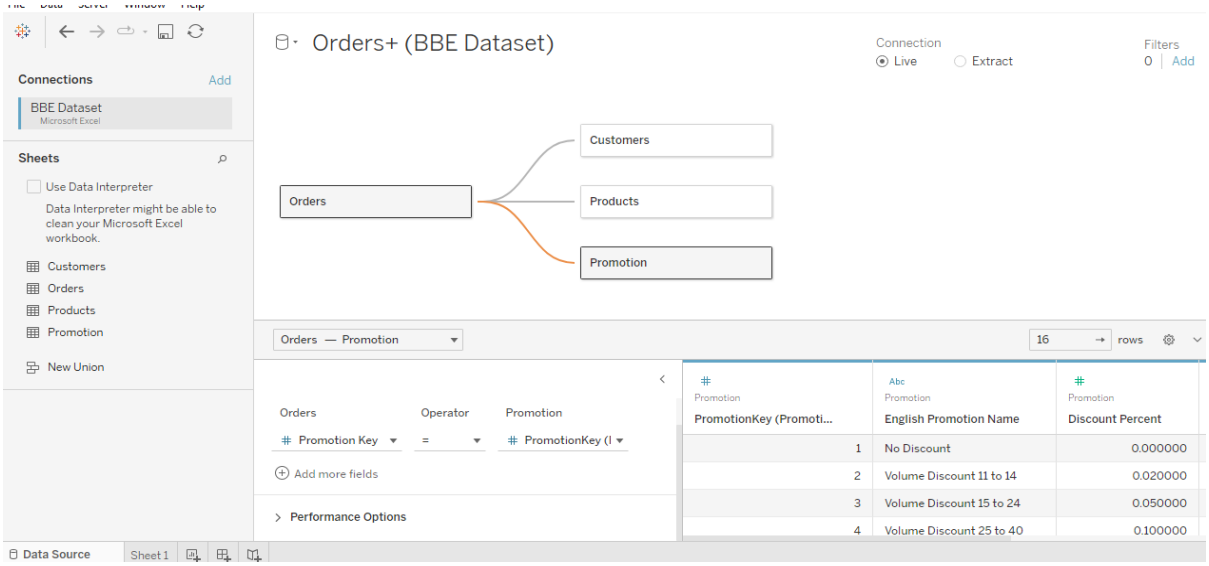
1. **Ease of Use:** Tableau offers an intuitive and user-friendly interface that empowers users to create detailed and complex visualisations and dashboards with minimal technical knowledge. The interface promotes a smooth learning curve with accessible drag-and-drop features, enabling both technical and non-technical users to navigate and utilise the tool effectively. (Figure 3)

Figure 3:BBE Analysis(Tableau)



2. **Customisation and Flexibility:** Tableau provides extensive customisation options, allowing users to tailor visualisations to their precise needs and preferences. It supports creating a wide range of visualisation types and enables detailed customisation of dashboard elements to enhance interpretability and aesthetics.
3. **Integration Capabilities:** Tableau's ability to integrate with various data sources, including databases, spreadsheets, and cloud-based data, is commendable. It ensures that users can pull data seamlessly from multiple sources to develop cohesive insights. (Figure 4)

Figure 4: Data relationship (Tableau)



4. **Scalability and Performance:** Tableau's architecture is designed to scale with the growing needs of organisations, maintaining high levels of performance even as data volumes and user demands increase. The software handles large datasets efficiently, ensuring a smooth user experience.
5. **Support and Community:** With a vibrant community of users and extensive support resources, Tableau users can easily find assistance and share knowledge. This supportive environment is conducive to learning and problem-solving.
6. **Cost Effectiveness:** While Tableau may have a higher cost compared to other solutions, it offers substantial value through advanced features and capabilities, justifying the investment for organisations seeking sophisticated analytical solutions.
7. **Analytical Capability and Depth:** Tableau shines in its analytical depth, providing advanced analytical and statistical features, including trend analysis, forecasting, and clustering, enabling users to extract meaningful insights and make data-driven decisions.
8. **Security and Compliance:** Tableau prioritises data security and compliance, offering robust features like row-level security and adhering to industry standards and regulations to ensure data integrity and security.

Conclusion:

Tableau distinguishes itself with its advanced analytics, superior visualisation capabilities, and user-friendly interface. Its scalability, robust support community, and strong security features make it a preferred choice for organisations seeking detailed and reliable insights. The higher cost may be a consideration, but the value delivered through sophisticated analytical capabilities and customisation options offsets the investment.

Consideration for BBE:

For Best Bike Ever (BBE), Tableau can be a strategic asset, enabling the organisation to visualise and understand its diverse datasets effectively. The intuitive interface and advanced features can empower BBE to leverage its data in strategic decision-making, contributing to enhanced performance and competitiveness in the market.

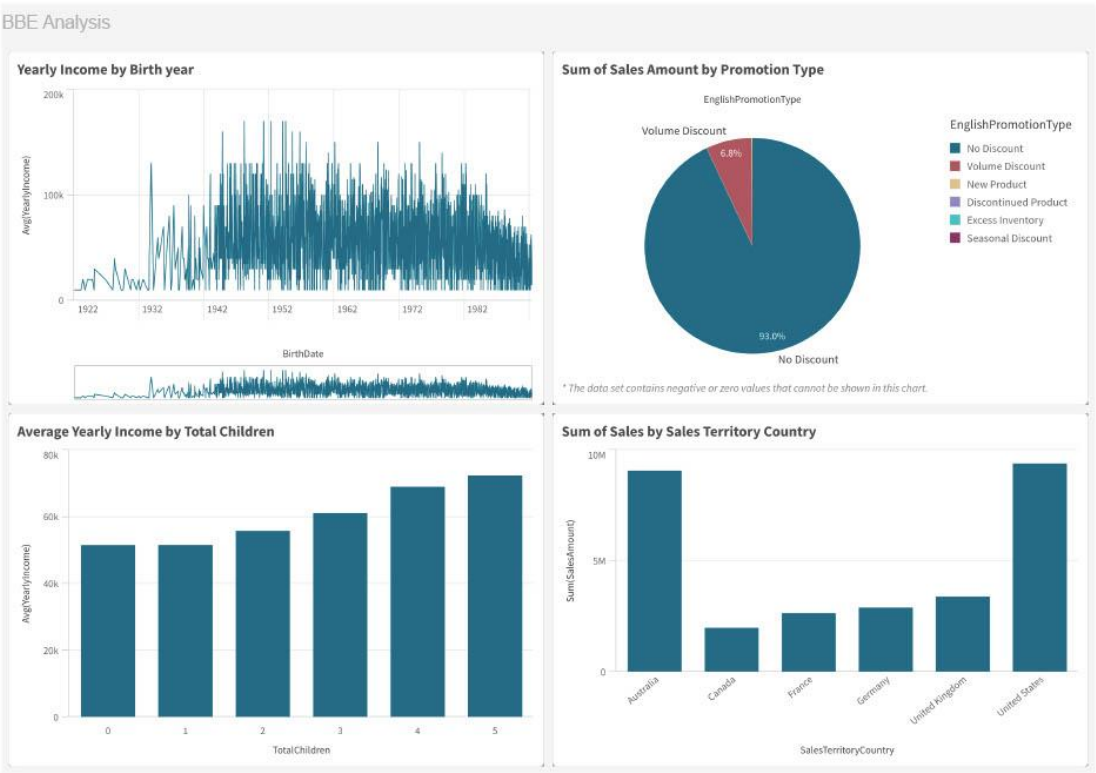
Qlik Sense

Qlik Sense is a next-generation, self-service data visualisation and business intelligence application known for its associative model, which allows interactive data visualisation and preparation. It is distinguished for its advanced, user-centric interface, enabling users to easily create flexible, interactive dashboards and detailed reports.

Analysis based on Criteria:

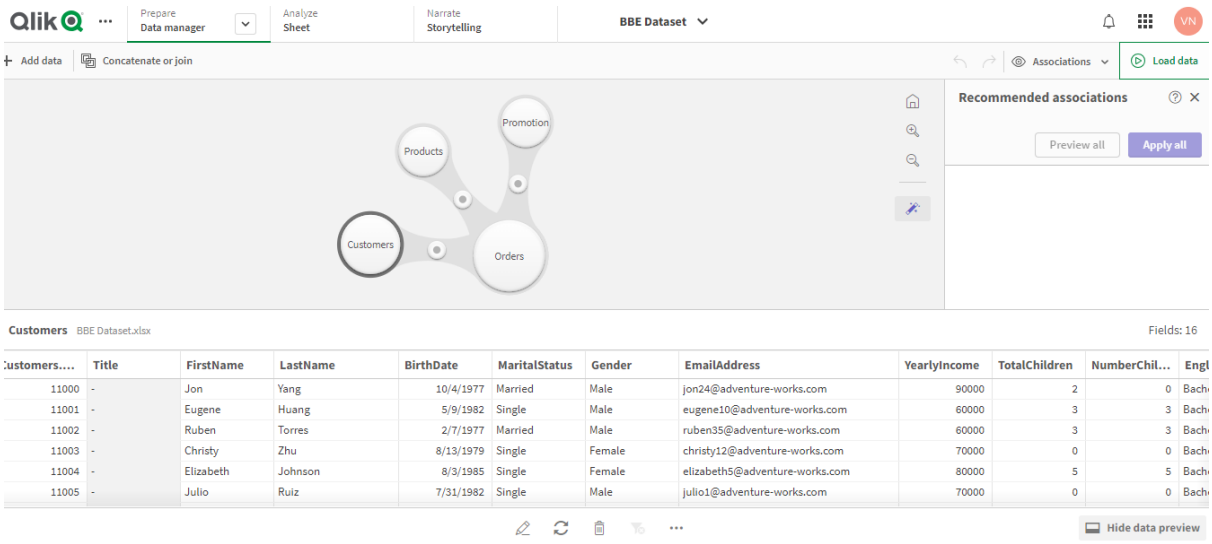
1. **Ease of Use:** Qlik Sense boasts a highly intuitive and responsive interface, ensuring users can easily create visualisations, explore data, and gain insights with minimal technical expertise. It offers user-friendly drag-and-drop features, enabling users to construct insightful dashboards and analyse data effectively. (Figure 5)

Figure 5: BBE Analysis(Qlik)



2. **Customisation and Flexibility:** The platform is highly adaptable, allowing users to create various visualisations, customise dashboard components, and alter visual elements to suit specific needs and preferences. It empowers users to design insightful, tailored analytical solutions effectively.
3. **Integration Capabilities:** Qlik Sense offers versatile integration with numerous data sources and advanced connectivity to different data providers, ensuring seamless and comprehensive data analysis across varied datasets. (Figure 6)

Figure 6: Data relationship(Qlik)



Customers....	Title	FirstName	LastName	BirthDate	MaritalStatus	Gender	EmailAddress	YearlyIncome	TotalChildren	NumberChil...	Engl
11000	-	Jon	Yang	10/4/1977	Married	Male	jon24@adventure-works.com	90000	2	0	Bach
11001	-	Eugene	Huang	5/9/1982	Single	Male	eugene10@adventure-works.com	60000	3	3	Bach
11002	-	Ruben	Torres	2/7/1977	Married	Male	ruben35@adventure-works.com	60000	3	3	Bach
11003	-	Christy	Zhu	8/13/1979	Single	Female	christy12@adventure-works.com	70000	0	0	Bach
11004	-	Elizabeth	Johnson	8/3/1985	Single	Female	elizabeth5@adventure-works.com	80000	5	5	Bach
11005	-	Julio	Ruiz	7/31/1982	Single	Male	julio1@adventure-works.com	70000	0	0	Bach

4. **Scalability and Performance:** Designed to scale, Qlik Sense handles increasing data volumes and growing user demands proficiently, ensuring sustained performance and responsiveness even as organisational needs evolve. Its advanced in-memory technology supports efficient data processing and prompt insights retrieval.
5. **Support and Community:** Qlik Sense has a substantial support network, including a dynamic community of users, extensive documentation, and various training resources, fostering a learning-friendly environment and facilitating problem resolution.
6. **Cost Effectiveness:** The software offers competitive pricing models, providing organisations with a balance between cost and value, especially considering its robust features and advanced analytical capabilities.
7. **Analytical Capability and Depth:** Qlik Sense is renowned for its deep analytical capabilities, featuring advanced analytical functions, predictive modelling, and dynamic data exploration, enabling users to delve into data intricacies and extract meaningful, actionable insights.
8. **Security and Compliance:** Security is a top priority in Qlik Sense, with features like robust access controls and compliance with industry regulations ensuring data safety and integrity.

Conclusion:

Qlik Sense stands out with its user-centric design, associative model, and robust analytical capabilities. Its scalability, wide-ranging integrations, and strong support network make it a valuable choice for organisations aiming for interactive and in-depth data analysis. The balanced cost-to-value ratio ensures organisations obtain substantial analytical value, positioning Qlik Sense as a strong contender in the business intelligence domain.

Consideration for BBE:

For Best Bike Ever (BBE), Qlik Sense could be an invaluable tool, enabling the company to explore data interactively and gain deep insights into business operations. The platform's adaptability and advanced analytical features can empower BBE to make more informed, data-driven decisions, fostering enhanced business performance and strategic advantage.

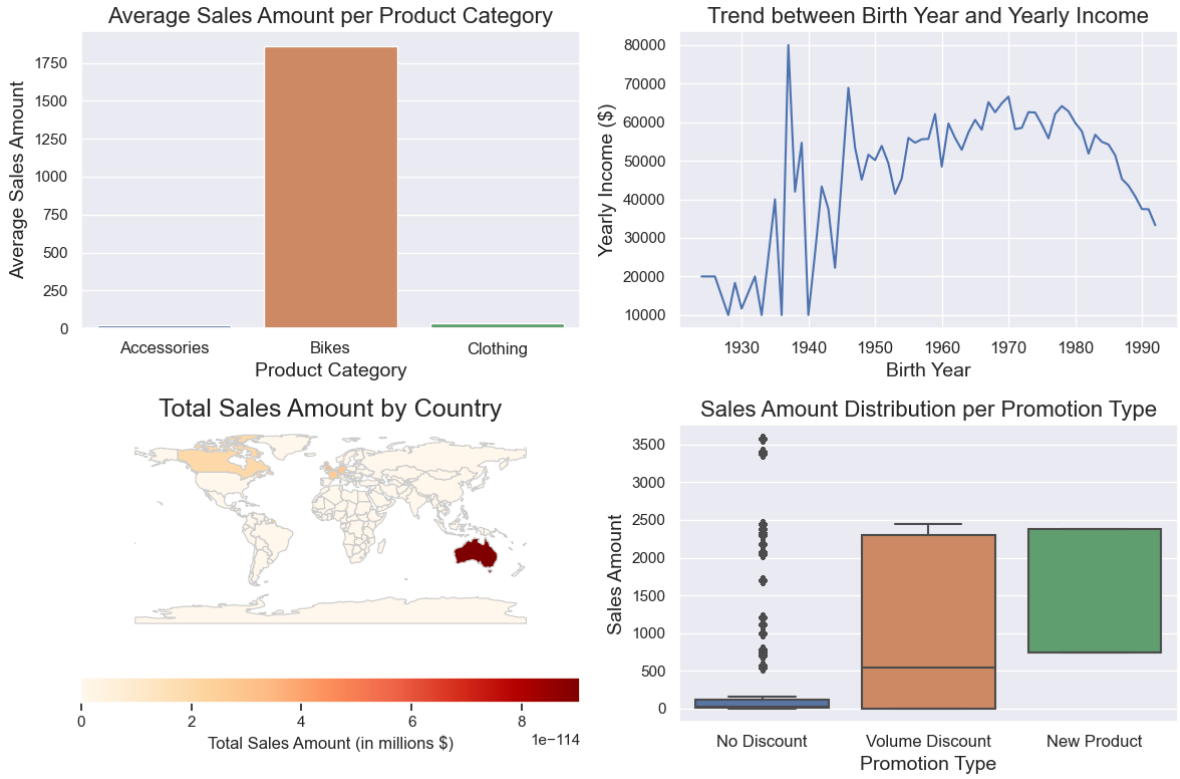
In-house Development (Python)

Developing a business intelligence solution in-house using Python primarily involves utilising basic plotting libraries to create static visualisations and aligning them in a Jupyter Notebook. This approach, while rudimentary, offers a basic level of data representation and analysis without the use of specialised dashboarding libraries. It is still possible to create dashboards with Python, but it requires advanced programming skills.

Analysis based on Criteria:

1. **Ease of Use**: Utilising Python in a Jupyter Notebook requires foundational knowledge of Python programming and data visualisation techniques. While the approach taken was simplified, creating effective and meaningful visualisations still demands a level of technical proficiency. However, the use of Jupyter Notebooks makes the process more accessible to those familiar with Python. (Figure 7)

Figure 7: BBE Analysis(Python)



2. **Customisation and Flexibility:** Without leveraging more advanced dashboarding libraries like Dash or Bokeh, the possibilities are inherently limited, particularly in terms of interactivity and user interface design. Writing a Python script takes quite a while, depending on the experience and what the aim is; therefore, it requires great experience and knowledge. The code required to create those plots in Figure 7 can be seen in Figure 8.

Figure 8: Python code for the plots

```
# Loading the Data
import pandas as pd
import geopandas as gpd
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
from matplotlib import gridspec

# Creating a figure
fig = plt.figure(figsize=(12, 8))
gs = gridspec.GridSpec(2, 2)  # 2 rows, 2 columns

# 1. Bar Chart: Average Sales Amount per Product Category
ax0 = plt.subplot(gs[0, 0])
sns.barplot(y='SalesAmount', x='ProductCategoryName', data=final_df, estimator=lambda x: sum(x) / len(x), ci=None,
ax=ax0)
ax0.set_title('Average Sales Amount per Product Category', fontsize=16)
ax0.set_ylabel('Average Sales Amount', fontsize=14)
ax0.set_xlabel('Product Category', fontsize=14)
ax0.tick_params(axis='x', labelsize=12)  # Rotate x-axis labels for better readability

# 2. Line Plot: Relationship between Yearly Income and Birth Year
ax1 = plt.subplot(gs[0, 1])
sns.lineplot(x='BirthYear', y='YearlyIncome', data=final_df, errorbar=None, ax=ax1)
ax1.set_title('Trend between Birth Year and Yearly Income', fontsize=16)
ax1.set_xlabel('Birth Year', fontsize=14)
ax1.set_ylabel('Yearly Income ($)', fontsize=14)
ax1.tick_params(axis='x', labelsize=12)  # Rotate x-axis labels for better readability

# 3. Geographic Plot: Sales Amount by Country
ax2 = plt.subplot(gs[1, 0])  # Adjusted the subplot index to position side by side
geo_df['SalesAmount'] = geo_df['SalesAmount'] / 1e6  # convert to millions
geo_plot = geo_df.plot(column='SalesAmount', cmap='OrRd', linewidth=0.8, ax=ax2, edgecolor='0.8', legend=True,
                       legend_kwds={'label': "Total Sales Amount (in millions $)",
                                    'orientation': "horizontal"})
ax2.set_title('Total Sales Amount by Country', fontdict={'fontsize': '18', 'fontweight': '3'})
ax2.set_axis_off()
# Setting fontsize of colorbar labels
if geo_plot.get_legend():
    geo_plot.get_legend().get_texts()[0].set_fontsize(12)  # Adjusting the fontsize of the legend label

# 4. Boxplot: Sales Amount Distribution per Promotion Type
ax3 = plt.subplot(gs[1, 1])  # Adjusted the subplot index to position side by side
sns.boxplot(y='SalesAmount', x='EnglishPromotionType', data=final_df, ax=ax3)
ax3.set_title('Sales Amount Distribution per Promotion Type', fontsize=16)
ax3.set_ylabel('Sales Amount', fontsize=14)
ax3.set_xlabel('Promotion Type', fontsize=14)
ax3.tick_params(axis='x', labelsize=12)  # Rotate x-axis labels for better readability

# Adjust spaces between plots
plt.tight_layout()

# Save the figure
plt.savefig('Multiple_Plots.png')

# Show the figure
plt.show()
```

3. **Integration Capabilities:** Python, combined with Jupyter Notebook, can integrate with various data sources, offering considerable compatibility and allowing for comprehensive data analysis across diverse datasets.
4. **Scalability and Performance:** The simplistic approach taken might struggle with scalability and optimal performance, especially when dealing with extensive data volumes or requiring real-time data updates.

5. **Support and Community:** Python has an extensive and active community along with abundant documentation and resources. However, since a more simplistic and basic approach was taken, support might be more generalised and not as specialised as it would be with specific dashboarding libraries.
6. **Cost Effectiveness:** The approach is cost-effective regarding licensing fees, as Python is open-source. However, there might be costs associated with development time, especially if more advanced features or optimisations are required in the future.
7. **Analytical Capability and Depth:** Python provides a wide range of analytical capabilities, even with basic plotting, enabling some level of insight extraction and data understanding. However, the depth of analysis is somewhat limited without leveraging more advanced analytical and visualisation libraries.
8. **Security and Compliance:** Implementing and maintaining security and compliance measures are complex, requiring consistent updates and monitoring to ensure data protection.

Conclusion:

In-house development using a simplified Python approach provides a foundation for basic data visualisation and analysis. However, it lacks advanced features, interactivity, and scalability found in more specialised solutions or dashboarding libraries. This approach might serve as a steppingstone for organisations exploring data analytics but would likely require advancement and enhancement to meet growing and evolving organisational needs.

Consideration for BBE:

For Best Bike Ever (BBE), a simplistic Python approach could serve as an initial exploration into data analytics, especially if the organisation has minimal needs and resources dedicated to business intelligence solutions. However, BBE should consider either advancing their in-house development efforts or adopting a more comprehensive solution to meet future demands and leverage the full potential of business analytics.

Recommendation

After meticulously analysing the four platforms, Tableau is the most recommended business intelligence solution for Best Bike Ever (BBE). The decision to recommend Tableau is substantiated by its robustness, ease of use, and versatile analytical depth, aligning well with BBE's organisational needs and objectives.

Reasoning:

1. **User-friendly Interface:** Tableau's interface is remarkably intuitive and user-friendly, allowing users to navigate and create dashboards with minimal learning curve. This quality is crucial for BBE, given the diverse user base within the organisation.
2. **Rapid Development:** The speed and ease with which dashboards can be created in Tableau are unparalleled, enabling quick insights and facilitating faster decision-making processes, essential for maintaining a competitive edge in the fast-paced business environment.
3. **Depth of Analysis:** Tableau's robust analytical capabilities enable in-depth data exploration, ensuring BBE can extract meaningful insights and make data-driven decisions to optimise operational efficiency and enhance business value.
4. **Community and Support:** With a vast community and extensive support resources, any challenges encountered during usage can be swiftly addressed, reducing downtime and maintaining business continuity for BBE.
5. **Learning Curve:** The ease of learning Tableau, coupled with the extensive training resources available, ensures that BBE staff can quickly become proficient in leveraging the platform's full capabilities.
6. **Scalability:** Tableau's scalability can support BBE's growth trajectory, ensuring sustained performance and reliability as the company's data and analytical needs evolve.
7. **Integration Capabilities:** Tableau's ability to integrate seamlessly with various data sources means BBE can leverage its existing data infrastructure, avoiding unnecessary complexities and costs associated with data migration or transformation.

Actionable Steps:

BBE should proceed with implementing Tableau, ensuring adequate training and support are provided to the users. BBE should also consider developing a centralised knowledge base and fostering a collaborative environment where users can share insights and knowledge, maximising the value derived from Tableau.

Conclusion

The exploration and analysis of the four different platforms provided profound insights into each offer's diverse capabilities and features. Each platform has its merits, from the flexibility and customisation offered by Python to the user-friendly interfaces of Qlik Sense and PowerBI. However, Tableau emerges as the optimal solution for Best Bike Ever (BBE), balancing user-friendliness, analytical depth, and rapid development capabilities. Its intuitive interface and ease of learning make it accessible to users of varying technical proficiencies within BBE, ensuring widespread adoption and utilisation. The speed and versatility it brings will empower BBE to make informed, data-driven decisions, thereby elevating operational efficiency, fostering innovation, and driving business growth. In implementing Tableau, BBE is not just adopting a tool but embracing a culture of analytics and insight-driven decision-making, positioning itself strategically in the competitive landscape.

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AI Use Acknowledgement

I have used Chat GPT and Grammarly to revise my writing and Google Bard for searching sources. They helped make the report more professional and concise and allowed me to use my time more effectively.