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RESEARCH PAPER

Blinkit sales analysis using power BI: uncovering insights through data visualization

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Abstract

The Blinkit dashboard serves as a vital tool for businesses, particularly in competitive markets where retaining existing customers proves more cost-effective than acquiring new ones. This study offers a detailed analysis of Blinkit operations using Microsoft Power BI, encompassing all key stages such as data preparation, data connection, cleaning, and the development of Key Performance Indicators (KPIs). The dashboard is designed to provide interactive visualizations, enabling users to gain meaningful insights and identify key findings effectively.

By leveraging a Blinkit grocery dataset, the project empowers business users with real-time, self-service analytics that enhance operational efficiency, improve customer satisfaction, and boost overall profitability. The resulting dashboards are tailored to meet the needs of business stakeholders, providing them with actionable insights based on data-driven decisions. The project's core objective is to bridge the gap between raw data and strategic decision-making by transforming unstructured grocery data into clear, impactful visual analytics. Ultimately, this approach turns complex datasets into intuitive dashboards that support smarter business actions and foster informed decision-making in dynamic retail environments.

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1. Introduction

In the fast-paced world of quick-commerce, businesses like Blinkit require real-time insights to drive operational efficiency, customer satisfaction, and strategic growth. To address these needs, a dynamic dashboard was developed using Microsoft Power BI—an advanced business intelligence tool known for its data visualization and reporting capabilities. The Blinkit Power BI dashboard integrates and transforms raw sales, customer, and operational data into an interactive, user-friendly interface that empowers stakeholders to make informed decisions swiftly. This dashboard presents key performance indicators (KPIs) such as total sales, average sales per transaction, customer ratings, and items sold. It enables the exploration of sales trends across different regions, product categories, and outlet types, providing a granular understanding of Blinkit's

business performance. Through visualizations like bar charts, donut charts, line graphs, and funnel diagrams, complex data is rendered in a format that's easy to comprehend and analyze. Interactive elements like filters, slicers, and drill-down capabilities make the dashboard highly customizable, allowing users to isolate specific insights based on parameters like location tier, outlet size, and product type. As a result, the Blinkit dashboard serves as a critical tool for enhancing operational strategy, refining marketing efforts, and improving customer experience across the platform.

The key objectives of this study, centered on the development and analysis of the Blinkit Power BI dashboard, are as follows:

- To visualize critical business metrics such as total sales, items sold, and customer ratings in a clear and actionable manner.
- To monitor sales performance across various

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dimensions including time, outlet type, product category, and geographic location.

- To identify consumer trends and preferences by analyzing product performance and customer behavior data.
- To evaluate the performance of Blinkit outlets based on size, region, and establishment year, and identify high-performing segments.
- To provide interactive, real-time data insights using Power BI's filtering, drill-down, and dynamic visualization features.
- To assist decision-makers in strategic planning by highlighting areas for improvement, optimization, and growth within the Blinkit network.
- To streamline business reporting processes by replacing static reports with a dynamic, centralized dashboard solution.
- To improve overall operational efficiency by enabling quicker access to key insights for marketing, supply chain, and retail management teams.

The remainder of the paper is organized as follows: Section II outlines the methodology and tools used, including data preprocessing and dashboard design. Section III presents the results and key visual insights. Section IV discusses the implications of these findings and provides strategic recommendations. Finally, Section V concludes the study with suggestions for future work and enhancements.

2. Literature review

In today's data-driven business environment, the application of business intelligence (BI) tools has become crucial for operational efficiency, especially in the rapidly evolving quick-commerce industry. Dashboards, as core components of BI systems, serve as interactive platforms for real-time monitoring, analysis, and decision-making. According to Ackerson (2010), dashboards consolidate data from multiple sources and present it in visual formats such as charts and graphs, enabling businesses to detect trends and respond promptly. Microsoft Power BI has emerged as a leading BI platform due to its accessibility, integration capabilities, and robust visualization tools. As stated by Power and Sharda (2007), BI platforms like Power BI are essential for converting large volumes of raw data into actionable insights. In the retail context, Mishra and Singh (2020) emphasized that real-time dashboards improve inventory control, customer segmentation, and sales forecasting. In the context of quick-commerce companies such as Blinkit, which operate under tight delivery timelines and dynamic demand patterns, the importance of real-time analytics is even more pronounced. A study by Sharma et al. (2022) highlighted the benefits of dashboards in managing supply chains and regional outlet performance, particularly in Tier 2 and Tier 3 cities.

Overall, the literature supports the adoption of Power BI dashboards in retail and e-commerce as vital tools for

improving agility, transparency, and data-driven decision-making—objectives that are central to Blinkit's operational strategy.

This paper proposes a comprehensive approach that leverages Power BI for data visualization and predictive modeling outputs for interactive blinkit sales analysis. The goal is to fill the identified gap by developing an accessible, user-centric dashboard that bridges data science and business operations. This integration enables real-time monitoring, root cause analysis, and informed decision-making to mitigate sales risks proactively.

3. Methodology for Power BI-based Blinkit Sales Analysis

The methodology for developing the Blinkit dashboard using Power BI follows a structured approach that includes data acquisition, preprocessing, modeling, visualization, and evaluation. This ensures that the final dashboard provides meaningful, accurate, and actionable business insights.

3.1 Data Collection

The first step involved gathering raw data from Blinkit's internal systems, including order transactions, product listings, customer ratings, and outlet information. Data sources included Excel files, SQL databases, and cloud-based APIs. These datasets covered multiple dimensions such as item type, outlet size, region, sales figures, and customer feedback.

The data collection of the blinkit grocery data set contains the metrics such as-

- Item Fat Content
- Item Identifier
- Item Type
- Outlet Establishment Year
- Outlet Identifier
- Outlet Location Type
- Outlet Size
- Outlet Type
- Item Visibility
- Item Weight
- Sales
- Rating

3.2 Data Preprocessing

Once collected, the data underwent cleaning and transformation using Power Query in Power BI. Key preprocessing steps included:

- Removing duplicate and null values.
- Formatting date fields for time-series analysis.
- Categorizing and encoding variables such as outlet type, product category, and location tier.
- Creating calculated columns and measures using DAX (Data Analysis Expressions) for metrics like total

revenue, average sales per order, and customer satisfaction scores.

- Outlet-level analysis revealed significant trends in sales performance. Medium-sized outlets in Tier 3 locations showed higher profitability, likely due to lower operational costs and growing demand. These patterns were captured using bar charts and funnel maps that compare metrics across size, type, and geographic distribution, helping stakeholders to optimize resource allocation and expansion planning.

3.3 Sales Performance Trends

- Total Sales and Revenue show consistent growth over time, with peak periods during weekends and promotional campaigns.
- Average order value tends to be higher in Tier 1 cities, while order frequency is greater in Tier 2 and 3 cities.

3.4 Customer Behavior

- High demand for low-fat and health-oriented products, suggesting a shift toward healthier consumption patterns.
- Customer ratings reveal that fresh produce and snacks receive higher satisfaction scores, while packaged food and frozen items score lower in quality and delivery time.

3.5 Top-Performing Products & Categories

- Fruits, vegetables, dairy, and snacks are among the top-selling product categories.
- Specific SKUs (e.g., bananas, milk, and bread) contribute disproportionately to revenue, identifying them as key drivers of customer retention.

3.6 User Engagement & Dashboard Interaction

- Stakeholders primarily use filters for region, outlet size, and product category to drill down into specific performance areas.
- The dashboard enables real-time tracking, allowing for agile marketing, supply chain adjustments, and restocking decisions.

3.7 Power BI Dashboard Overview

Power BI was utilized to develop an interactive and visual dashboard for Blinkit sales analysis. It was designed to deliver actionable insights to business users in a user-friendly format, eliminating the need for advanced technical expertise. The dashboard included several key components that provided a clear overview of sales performance, trends, and customer behavior, helping stakeholders make informed decisions and drive strategic business actions effectively.

3.7.1 Over View of the dashboard

These are attributes that are on higher level of the analysis

- Total sales
- Average Sales
- No of items
- Fat Content
- Fat by Outlet
- Item type
- Outlet Establishment
- Outlet Size
- Outlet Location
- Outlet Type

3.7.2 Dynamics Analysis of the Dashboard

- Total Sales – The Overall revenues generated from all items sold
- Average Sales – The average revenue per sale
- Number of Items – The Total count of different items sold
- Average Rating – The average customer rating for items sold.

4. Key Insights from the blinkit Dashboard

The Blinkit dashboard using Power BI reveals key insights, including total sales of \$0.997 million from 7060 items sold, with an average sale of \$141 and a customer rating of 3.9/5. It highlights consumer preferences for low-fat products and identifies top-selling categories like fruits and snacks. Medium-sized outlets in Tier 3 locations show the highest profitability, while supermarkets generate greater sales volumes. Interactive filters allow tailored analysis, and visualizations track growth trends and sales distribution, enabling data-driven decision-making for improved business strategies. Overall, the dashboard enhances understanding of sales performance and consumer behavior.

Power BI's interactive capabilities—such as slicers, drill-down, and cross-filtering—allow users to view sales performance by outlet size, region, and product type. These dynamic filters enable granular exploration, making insights more actionable and enhancing user experience by tailoring the view to individual decision-making needs.

Outlet-level analysis revealed significant trends in sales performance. Medium-sized outlets in Tier 3 locations showed higher profitability, likely due to lower operational costs and growing demand. These patterns were captured using bar charts and funnel maps that compare metrics across size, type, and geographic distribution, helping stakeholders to optimize resource allocation and expansion planning.

4.1 Features of the dashboard

- Filter Panel: Enables filtering by outlet location type, outlet size and item type

- Outlet Establishment trend: Visual representation of outlet growth from 2021 to 2022
- Fat Content Analysis: sales breakdown between low fat and regular fat products
- Item Type Distribution: Sales distribution across various product categories
- Outlet Size and Location Analysis: Insights on Sales Performance by outlet size and Location Tier.
- Outlet Type Comparison: comparison of sales, number of items, average sales ratings and item visibility across different outlet types

4.2 DAX Formulas

In Power BI, DAX (Data Analysis Expressions) formulas are used to create calculated columns, measures and to perform data analysis while I don't have access to the specific DAX formulas used in the blinkit dashboard, I Can provide you with some common DAX formulas that might be reverent for a dashboard like this:

4.2.1 Total Sales

Fig. 1 presented dashboard offers a comprehensive visualization of Blinkit's business performance, focused on

item sales, customer interaction, and outlet efficiency. The left sidebar identifies filters such as Product Category, Outlet Type, and Season Type. At the top, we see key metrics: Total Sales of 0.997 million, 7060 items, an average sale value of \$141, and an average customer rating of 3.9. The Output Overview line graph shows a steady increase in sales across months, indicating consistent business growth. The Item Context pie chart reveals that 56% of items are non-food, while 44% are food-related, reflecting a balanced product offering. The Top Name bar graph highlights the most popular items such as jam, gum, milk, and biscuits. Another section visualizes Item OnRME, breaking down item engagement by platforms like in-store (33%), online (36%), and categories like daily and burger, each holding about 33%. Moving right, Output Type is displayed in a donut chart, showing a nearly even split, with 67% high engagement. Output Location is ranked with 3500K, 320K, and 200K sales values across different regions. The bottom table compares Supermarket, Convenience, Online, and Small Mart outlets in terms of total sales, average sales, average rating, and item type popularity. Online outlets lead in total sales (\$330K), while small marts show the highest average sales per item (\$200). This dashboard succinctly captures operational insights and consumer behavior for informed business decisions.

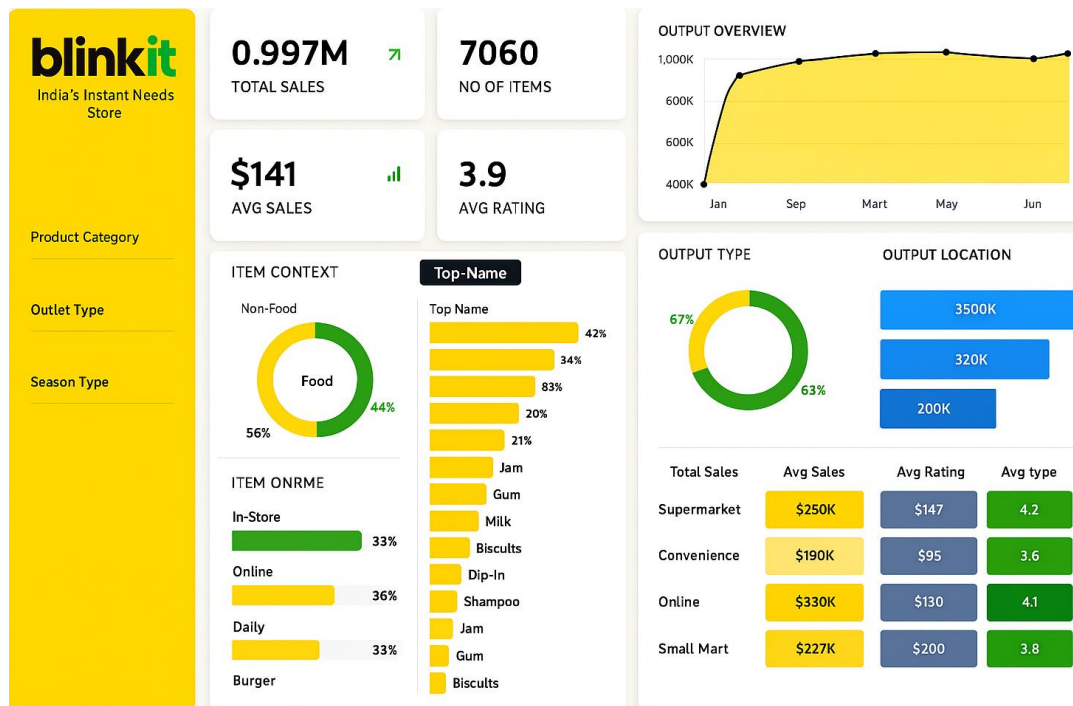


Figure 1: Total Sales by Outlet Type.

Fig. 2 presents a digital dashboard for Blinkit, focusing on a Tier 2 outlet with a medium size that sells fruits and vegetables. The dashboard reveals that the total sales amount to \$0.020M with 140 items listed. The average sale per item is \$144, and the average customer rating is a strong 4.0. A pie

chart displays fat content distribution, showing that 79 items are regular fat and 61 are low fat. All 140 items belong to the "Fruits and Vegetables" category, illustrated in the item type section. The outlet establishment trend shows a steady decline in new outlet openings from 2015 to 2020, with the most

recent establishment in 2020. Additionally, the medium-sized outlet is situated in a Tier 2 city, contributing \$20K in sales. The outlet is classified as "Supermarket Type 1" and is marked by decent item visibility (0.06), indicating moderate

customer engagement with listed products. The clean and vibrant design provides a comprehensive snapshot of performance metrics, item distribution, and outlet classification for effective decision-making.

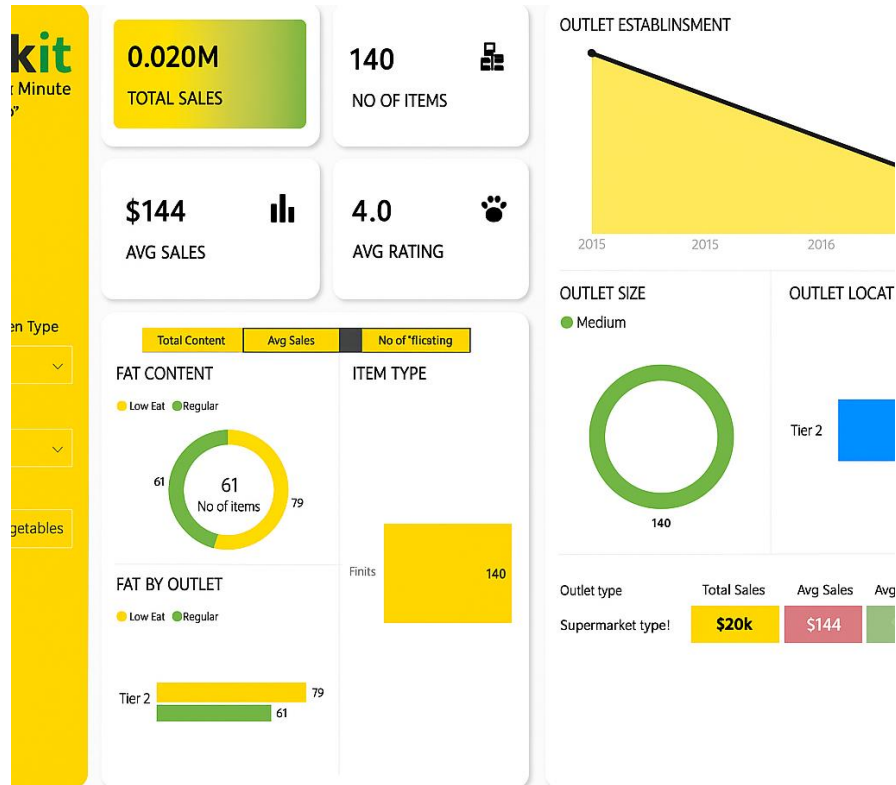


Figure 2: Total Sales by Fruits and Vegetables by high outlet.

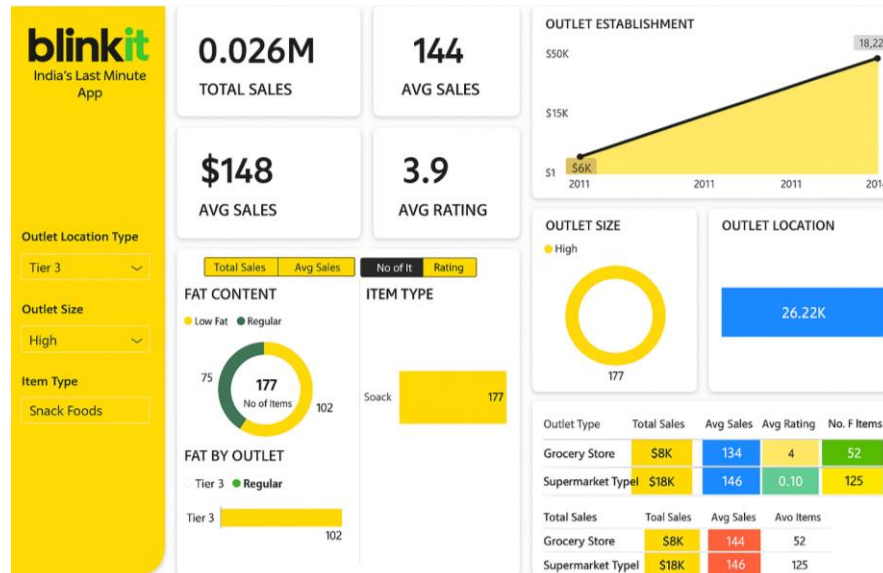


Figure 3: Total Sales by Snacks by medium Outlet.

Fig. 3 displays a Power BI dashboard for Blinkit, India's last-minute grocery delivery app, presenting a comprehensive analysis of sales data. The dashboard provides several key

performance indicators (KPIs) at the top, including total sales (0.026M), average sales (\$148), number of items (177), and average rating (3.9). Interactive visual elements, such as line

charts, pie charts, and bar graphs, are used to represent sales trends, outlet characteristics, and customer preferences. The Outlet Establishment line chart shows a steady increase in sales from \$6K in 2011 to over \$18K by 2014. The fat content pie chart breaks down items into low fat and regular, indicating a greater number of regular items. Filters on the left allow users to drill down by Outlet Location Type, Outlet Size, and Item Type. The donut chart and bar graph on outlet size and location provide insights into item distribution, with Tier 3 locations showing the highest item volume. A comparative table at the bottom evaluates Grocery Stores vs. Supermarkets across metrics like total sales, average sales, average rating, and number of items, showing that supermarkets outperform grocery stores in most categories. Overall, the dashboard empowers business users to make data-driven decisions quickly and effectively.

5. Decisions

The Blinkit Dashboard, developed using Power BI, serves as a pivotal tool for data-driven decision-making within the organization. Several key discussions arise when evaluating its design, functionality, and impact on business operations.

5.1 Data Integration and Quality

One of the primary discussions revolves around the integration of various data sources. The dashboard pulls data from SQL databases and Excel spreadsheets, which raises questions about data consistency and quality. Ensuring that the data is accurate, up-to-date, and free from discrepancies is crucial for reliable insights. Regular audits and validation processes are necessary to maintain data integrity, especially as new data sources are integrated. The dashboard enables data-driven decision-making by consolidating real-time data into actionable KPIs. Key KPIs such as total sales, average sales per order, customer satisfaction ratings, and product-wise performance allow business users to recognize trends, identify underperforming categories, and make timely adjustments in inventory, pricing, or marketing strategies.

5.2 User Experience and Accessibility

The user interface design is another focal point of discussion. The dashboard aims to provide an intuitive experience, allowing users to navigate easily and access relevant information quickly. Feedback from end-users is essential in this regard. Continuous user testing and iterative design improvements can enhance usability, ensuring that the dashboard meets the diverse needs of stakeholders, from executives to operational staff.

5.3 KPI Relevance and Adaptability

The selection of key performance indicators (KPIs) is a critical topic. While the current KPIs—such as total sales, average transaction value, and customer satisfaction ratings—

are relevant, discussions should focus on their adaptability. As Blinkit evolves, new KPIs may emerge that better reflect changing business objectives or market conditions. The dashboard should be flexible enough to accommodate these changes without requiring a complete redesign.

5.4 Real-Time Data Utilization

The decision to implement scheduled data refreshes raises discussions about the balance between real-time data access and system performance. While timely insights are essential for decision-making, frequent data refreshes can strain system resources. Evaluating the optimal refresh frequency based on user needs and system capabilities is vital to ensure that the dashboard remains responsive and efficient.

5.5 Training and Adoption

Another important discussion point is the training and onboarding of users. For the dashboard to be effective, users must understand how to leverage its features fully. Providing comprehensive training sessions, user manuals, and ongoing support can facilitate adoption and empower users to make the most of the dashboard's capabilities.

5.6 Future Enhancements and Scalability

As Blinkit continues to grow, discussions about future enhancements to the dashboard are inevitable. Stakeholders should consider potential new features, such as advanced analytics, predictive modeling, or integration with machine learning tools. Planning for scalability ensures that the dashboard can evolve alongside the organization's expanding data landscape and analytical needs.

5.7 Impact on Decision-Making

Finally, discussions should focus on the dashboard's impact on decision-making processes. By providing actionable insights, the Blinkit Dashboard aims to enhance strategic planning and operational efficiency. Evaluating how the dashboard influences key business decisions and outcomes will help measure its effectiveness and identify areas for further improvement. In summary, the discussions surrounding the Blinkit Dashboard using Power BI encompass a wide range of topics, from data quality and user experience to future scalability and impact on decision-making. Engaging stakeholders in these discussions will be crucial for maximizing the dashboard's value and ensuring it remains a vital tool for Blinkit's success.

6. Future Scope

- **Advanced Predictive Analytics:** Integrating machine learning algorithms to forecast sales trends and customer behavior. Utilizing predictive models to enhance inventory management and reduce stock outs.

- Real-Time Data Updates: Automating data refresh processes to provide stakeholders with up-to-date insights. Implementing live data feeds for immediate access to performance metrics.
- Expanded Metrics: Including operational metrics to assess efficiency and productivity. Adding customer satisfaction metrics to gauge user experience and feedback.
- Enhanced User Experience: Improving the dashboard's interactivity with more customizable filters and visualizations. Ensuring a user-friendly interface that caters to various stakeholder needs.
- Cross-Departmental Insights: Integrating data from different departments (e.g., marketing, finance) for a holistic view. Facilitating collaboration among teams by sharing insights derived from the dashboard.

7. Advantages

As the evaporator temperature rises, refrigeration output increases Ensuring that key metrics are easily viewable on various devices.

- User-Friendly Interface: Power BI provides an intuitive and interactive interface, making it easy for users to navigate and understand the dashboard without extensive training.
 - Real-Time Data Visualization: The dashboard can display real-time data, allowing stakeholders to monitor key performance indicators (KPIs) and metrics as they change, facilitating timely decision-making.
 - Customizable Reports: Users can create tailored reports and dashboards that meet specific business needs, enabling a focus on the most relevant data for different stakeholders.
 - Integration with Multiple Data Sources: Power BI can connect to various data sources, including databases, cloud services, and spreadsheets, allowing for comprehensive data analysis from multiple channels.
 - Advanced Analytics: The dashboard can leverage Power BI's advanced analytics features, such as predictive analytics and machine learning, to uncover trends and insights that drive strategic decisions.
 - Collaboration and Sharing: Power BI facilitates easy sharing of dashboards and reports among team members, promoting collaboration and ensuring that everyone has access to the same data.
 - Interactive Visualizations: The dashboard supports a wide range of visualizations (charts, graphs, maps) that help users interpret data more effectively and identify patterns or anomalies.
 - Mobile Accessibility: Power BI dashboards can be accessed on mobile devices, allowing users to view and interact with data anytime and anywhere, enhancing flexibility and responsiveness.
- Data Security and Governance: Power BI provides robust security features, including role-based access controls, ensuring that sensitive data is protected and only accessible to authorized users.
 - Cost-Effective Solution: Power BI offers a range of pricing options, making it a cost-effective solution for businesses of all sizes to implement powerful data analytics and visualization capabilities.

4. Conclusion

- The Blinkit Dashboard, developed using Power BI, represents a significant advancement in the organization's approach to data analytics and business intelligence. By consolidating diverse datasets into a single, interactive platform, the dashboard empowers stakeholders to make informed decisions based on real-time insights. The integration of key performance indicators (KPIs) such as total sales, customer satisfaction ratings, and inventory levels provides a comprehensive view of operational performance, enabling Blinkit to respond swiftly to market dynamics.
- The user-friendly interface, enhanced by dynamic filters and visualizations, facilitates deeper data exploration, allowing users to tailor their analyses according to specific needs. This adaptability is crucial in a fast-paced business environment where timely insights can drive competitive advantage. Furthermore, the implementation of scheduled data refreshes ensures that the dashboard remains current, providing stakeholders with the most relevant information for decision-making.
- As Blinkit continues to grow, the dashboard's scalability will allow for the integration of new data sources and analytical features, ensuring its long-term relevance. Continuous user feedback and iterative improvements will further enhance its functionality and usability.
- In conclusion, the Blinkit Dashboard is not just a reporting tool; it is a strategic asset that fosters a culture of data-driven decision-making. By leveraging the capabilities of Power BI, Blinkit is well-positioned to optimize operations, enhance customer satisfaction, and drive sustainable growth in an increasingly competitive landscape.

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