

Sales Data Visualization for Rumah Berkebun Shopee Store Using Business Intelligence and Google Data Studio

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Abstract: This study focuses on the analysis and visualization of sales data from Rumah Berkebun through a Business Intelligence (BI) approach, facilitated by the Google Data Studio platform. Utilizing an interactive dashboard, the research uncovers sales trends for key products such as durian and avocado seeds while identifying prominent seasonal demand variations. The dataset spans a two-year period (2022-2023) and incorporates critical metrics, including total sales, transaction volume, and order cancellation rates. Findings indicate notable seasonal fluctuations, with peak sales recorded in June 2022 and December 2023, alongside dominant market contributions from South Sumatra and Lampung. Conversely, regions like Bali and Nusa Tenggara exhibited substantial declines in sales performance. Quantitative insights were derived using statistical methods such as linear trend analysis and geographic heatmaps to map sales patterns and regional disparities. A significant challenge lies in the elevated order cancellation rates, largely attributed to payment-related obstacles, which hinder customer satisfaction. The adoption of BI has demonstrated its value in optimizing operational efficiency, enabling targeted stock and promotional strategies, and bolstering Rumah Berkebun competitive edge in digital and e-commerce landscapes. These results underscore the critical role of BI technology in fostering data-driven decision-making for online businesses.

Keywords: Business Intelligence; Google Data Studio; Sales Performance; Interactive Dashboard; Data Visualization.

1. Introduction

Rapid advancement of technology has fundamentally transformed various aspects of life, particularly in the business domain, by introducing information technology that intensifies competition among industry players. This dynamic landscape compels business organizations to adapt swiftly to changes while relying on accurate, timely information to monitor operations and achieve strategic objectives [1]. One prominent manifestation of technological progress is the rise of electronic commerce (E-commerce), a platform that enables online buying and selling transactions. E-commerce offers unparalleled convenience, allowing consumers to purchase products without visiting physical stores. This digital marketplace spans a wide array of goods, including home and gardening supplies such as plant seeds, flowers, fertilizers, and tools, all readily accessible through websites or mobile applications [2]. Data visualization emerges as a powerful tool for extracting and communicating actionable insights from complex sales data. Platforms like Google Data Studio facilitate the transformation of raw data into intuitive visual formats, such as interactive charts, graphs, and geographical heatmaps. These visualizations enable stakeholders to discern patterns, trends, and anomalies with greater ease, thereby enhancing comprehension of business performance [3]. Beyond improving data interpretation, visualization serves as a cornerstone for informed decision-making, empowering businesses to identify high-demand product categories, optimize pricing strategies, and design targeted promotional campaigns. Consequently, data visualization provides a distinct competitive edge in navigating ever-evolving market dynamics and consumer preferences.

Rumah Berkebun, an online store established in July 2021, specializes in gardening products. It offers a diverse range of items including fruit and ornamental plants, fertilizers, and related equipment. Despite achieving a steady average of 10-15 transactions per day, the store has yet to fully leverage its accumulated sales data. This is to inform and refine its business strategies. This underutilized data holds immense potential to uncover critical insights, such as identifying top-performing products, detecting seasonal sales patterns, and understanding customer behavior. Harnessing these insights could significantly enhance sales turnover, streamline operational efficiency, and improve customer satisfaction. This would position Rumah Berkebun for sustainable growth in a competitive e-commerce landscape [4]. Existing literature highlights diverse approaches to sales data visualization and application in business contexts. For instance, Pendawa (2023) employed Tableau to develop a dashboard for the Shillo Store, enabling clear insights into sales trends and facilitating strategic planning [4]. Similarly, Arfandi (2024) utilized Looker Studio to deliver real-time data visualizations, which expedited decision-making processes for businesses [5]. Additionally, Feri Irawan (2024) combined Looker Studio with BigQuery to analyze grocery store sales data, providing a robust framework for evaluating performance metrics [6]. While these studies demonstrate the efficacy of visualization tools, they often fall short of addressing how such solutions can be customized to meet the unique needs of small-scale businesses or tackle specific operational challenges. Many small enterprises, like Rumah Berkebun, face distinct hurdles such as limited resources, niche market demands, and high order cancellation rates. These hurdles require tailored analytical approaches not adequately covered in prior research.

Moreover, the integration of Business Intelligence (BI) tools in small e-commerce businesses remains underexplored, particularly in the context of localized markets and specific product categories like gardening supplies. The lack of in-depth studies on how BI can address issues such as inventory mismanagement, seasonal demand fluctuations, and customer retention strategies presents a significant research gap. This gap is further compounded by the limited discussion on the practical implementation of BI tools in enhancing competitiveness within Indonesia's burgeoning e-commerce sector. This is where small businesses must contend with both local and international players. This study seeks to address these deficiencies by focusing on the visualization of sales data from Rumah Berkebun Shopee Store over the past two years (2022-2023), employing Google Data Studio as a BI tool. The primary objective is to generate detailed, actionable insights tailored to the store's operational needs and market challenges. By developing an interactive dashboard, this research aims to identify key sales trends, seasonal patterns, and regional performance disparities. It addresses critical issues such as order cancellations and payment obstacles. Unlike previous studies, this work emphasizes a customized approach. This ensures that the visualization solutions directly align with Rumah Berkebun business model and strategic goals. Furthermore, the study explores how BI-driven insights can optimize inventory management, enhance promotional efforts, and improve customer engagement, contributing to operational efficiency. This research underscores the transformative potential of BI tools for SMEs e-commerce businesses, particularly in data-driven decision-making. By presenting a practical framework for leveraging sales data, the study not only offers a replicable model for similar enterprises. It also contributes to the growing body of knowledge on digital business strategies. Ultimately, this work aims to strengthen Rumah Berkebun competitive position in the e-commerce market. It also demonstrates how technology adoption can bridge the gap between small-scale operations and large-scale success. The findings are expected to provide valuable guidance for other small businesses seeking to navigate digital marketplaces through informed, strategic use of data.

2. Related Work

This research builds upon a growing body of literature that explores the application of Business Intelligence (BI) methods and data visualization techniques in sales and data analysis, particularly within the e-commerce and retail sectors. BI and visualization tools have been increasingly recognized as critical enablers for data-driven decision-making, offering businesses the ability to uncover trends, optimize operations, and enhance competitiveness in dynamic markets [8]. Several studies have investigated the implementation of BI dashboards and platforms like Google Data Studio, Tableau, and Looker Studio. These studies have provided valuable insights into their potential to transform raw data into actionable strategies. One notable study is by Ramadhani *et al.* (2024) examined the implementation of BI in analyzing Mitsubishi car sales data through interactive dashboards. Their findings demonstrated that BI tools significantly improved decision-making efficiency by enabling stakeholders to identify seasonal sales trends and formulate optimal stock strategies [16]. However, the study lacked an in-depth analysis of customer preferences across geographical regions, limiting its applicability to businesses with location-specific market dynamics. Similarly, Lullail *et al.* (2024) explored the use of Google Data Studio for visualizing Honda sales data, emphasizing how simple yet informative visualizations enhanced business owners' understanding of performance metrics [17]. While their work highlighted the accessibility of such tools, it did not address specific operational challenges, such as payment issues or order cancellations. These challenges are critical for small-scale e-commerce businesses.

Further insights into data visualization are provided by Pendawa (2023), who utilized Tableau to develop a dashboard for Shillo Store, an online shop. The study underscored the role of BI in facilitating sales trends identification and supporting strategic planning [4]. In a complementary vein, Arfandi *et al.* (2024) employed Looker Studio to create real-time visualizations of sales and customer satisfaction data, highlighting the tool's capacity to accelerate decision-making processes [5]. Additionally, Zai *et al.* (2024) combined BigQuery with Looker Studio to analyze grocery store sales, offering a robust framework for evaluating performance metrics through large-scale data processing [6]. Despite these contributions, many studies fall short of tailoring visualization solutions to small businesses, often focusing on larger enterprises or generic applications without addressing niche market challenges or specific operational bottlenecks. The application of Google Data Studio, in particular, has gained traction in recent research due to its accessibility and integration capabilities. Fernando (2018) explored Google Data Studio's potential for data visualization, demonstrating its effectiveness in presenting complex datasets in an intuitive format [13]. More recently, Manurung (2024) applied the platform to create dashboards for visualizing baseball data, showcasing its versatility across diverse domains [14]. Minatania (2023) further illustrated its utility in public health contexts by visualizing COVID-19 data for West Java, emphasizing the platform's ability to handle temporal and geographical data effectively [18]. While these studies affirm Google Data Studio's flexibility, they rarely focus on e-commerce-specific challenges, such as seasonal demand fluctuations or customer retention strategies, which are pivotal for online businesses like Rumah Berkebun.

Moreover, the broader context of e-business and digital business strategies has been addressed in works such as Appridonal *et al.* (2023), who discussed e-commerce platform optimization as a key driver of digital business growth [2]. Fauziah (2020) examined Shopee's communication strategies to boost sales, sheds light on online marketplace competitive dynamics in Indonesia [15]. These studies provide a foundational understanding of the e-commerce ecosystem but lack a direct connection to BI-driven analytics or data visualization as mechanisms for operational improvement. In contrast, Chaudhuri *et al.* (2011) offers a comprehensive overview of BI technologies, arguing that their integration into business processes is essential for leveraging data as a strategic asset [8]. This perspective aligns with current research's emphasis on BI as a transformative tool for small e-commerce enterprises.

Despite the wealth of existing literature, several gaps remain unaddressed. First, many studies focus on large-scale or generic applications of BI and visualization tools, with limited attention to the specific needs of small businesses operating in niche markets like gardening supplies. Second, critical operational issues such as order cancellation rates, payment obstacles, and inventory mismanagement—common challenges for small e-commerce stores—are often overlooked. Third, while geographic and temporal analyses are occasionally included, they are rarely combined with product and category-specific insights to provide a holistic view of sales performance. This research aims to bridge these gaps by focusing on Rumah Berkebun sales data from its Shopee Store over a two-year period (2022-2023), utilizing Google Data Studio to create an interactive dashboard tailored to the store's unique challenges. By integrating geographical, temporal, and product category-based analyses, this study offers a comprehensive approach to sales data visualization. It also explicitly addresses payment and cancellation factors, which have been underexplored in prior works, to provide actionable insights for improving customer satisfaction and operational efficiency. In doing so, this research not only builds on previous studies [4][5][16][17], but also extends the scope of BI applications in e-commerce by proposing customized solutions for small businesses. The results are expected to contribute

to the literature on digital business strategies. They are also expected to serve as a practical framework for similar enterprises seeking to harness data for competitive advantage.

3. Research Method

This study employs a quantitative approach to analyze sales data from Rumah Berkebun, an online store based in Badransari Village, Pekalongan District. It specializes in gardening products. The quantitative approach was selected due to its ability to produce objective, measurable, and statistically valid data, which are essential for supporting business analysis and decision-making processes [7]. Sales data extracted from Shopee transactions over a two-year period (2022-2023), are processed using Business Intelligence (BI) methods. BI has been widely recognized for its effectiveness in enhancing data processing efficiency and facilitating data-driven decision-making in various businesses [8]. The processed data are visualized through an interactive dashboard using Google Data Studio. This is a tool known for its capacity to transform complex datasets into intuitive visual representations. Interactive data visualization has been shown to significantly improve stakeholders' understanding of business performance metrics, as supported by prior research [9]. This visualization enables Rumah Berkebun to monitor sales performance, identify key trends, and formulate data-driven business strategies. The outcomes of this study are expected to contribute to more accurate and strategic decision-making, aligning with existing literature that underscores the role of BI in enhancing online businesses' competitiveness [10].

3.1 Research Flow Chart

The research process follows a structured framework to ensure systematic data collection, analysis, and visualization. The flowchart below outlines the key stages of the methodology, which are further detailed in the subsequent sections.

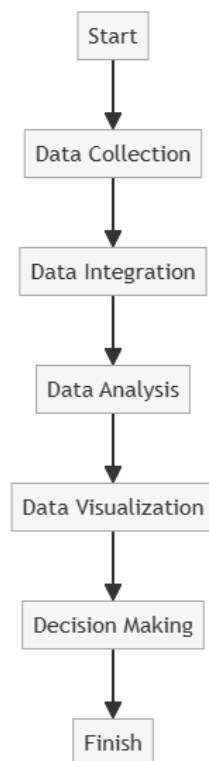


Figure 1. Research Flowchart

The data collection method involves direct observation of sales reports exported from Rumah Berkebun Shopee platform. These reports, available in Excel format, encompass transaction data for the past two years (2022-2023) and include fields designed to facilitate comprehensive analysis.

3.2 Research Stages

Business Intelligence (BI) serves as the foundational framework for this study, integrating processes such as data collection, analysis, and visualization to support strategic decision-making. BI aims to provide deep insights into business performance, market trends, and operational success factors by leveraging internal and external data. As a comprehensive approach, BI incorporates architectural frameworks, databases, analytical

tools, and applications to deliver actionable information for organizational decision-making [11]. BI enables the identification of critical sales patterns, best-selling products, seasonal trends, and customer segmentation, all of which contribute to more effective and efficient business strategies [12].

The research methodology is divided into several main stages including data collection, data integration, data analysis, data visualization, and decision making. The first stage, data collection, is carried out through direct observation of sales reports exported from historical transaction data on Rumah Berkebun Shopee platform. This data covers a two-year period (2022-2023) in Excel format and includes key variables such as product volume (number of items sold per transaction), transaction time (date and time of each transaction), unit price (price per item sold), and customer information (geographical location and product preferences). To ensure accurate and relevant data, data collection is carried out systematically with regular updates that reflect current market conditions. Data validation includes checking for completeness and identifying discrepancies such as duplicate entries or missing values, using manual inspection techniques on transaction records and Excel data processing functions to detect inconsistencies. After collection, the data enters the integration stage where a cleansing process is carried out to remove anomalies such as duplication or input errors. The cleaned data is then organized into a structured format and integrated into a BI-based system for analysis. Key steps in this stage include data categorization, which is grouping data based on dimensions such as time (e.g., monthly or seasonal), product type, and customer demographics, and data normalization to standardize the format to be compatible with analytics tools such as Google Data Studio. This integration process ensures that the data set is consistent and ready for in-depth analysis, while minimizing errors that can affect the results. The data analysis stage is carried out to uncover sales patterns and trends using descriptive statistical methods. The focus includes seasonal trend analysis to identify sales frequency during certain periods such as the holiday season, sales product analysis to determine products with high demand based on sales frequency and volume, and customer segmentation to group customers based on geographic location or purchase category to understand regional and behavioral patterns. The tools used in this stage are Google Sheets for initial data pre-processing and Google Data Studio for advanced analysis and visualization, which allow for efficient handling of large datasets and extraction of meaningful insights. The described data is then visualized using Google Data Studio to create interactive dashboards tailored to Rumah Berkebun operational needs. The dashboard design incorporates visual elements such as bar charts to compare sales volumes across products, pie charts to depict the percentage distribution of sales by category, line graphs to show monthly or seasonal sales trends over time, and interactive maps to visualize the geographic distribution of customers and sales. The dashboard is designed with effective data visualization principles in mind, prioritizing clarity, consistency, and ease of interpretation, with success metrics that include user feedback on the usability and functionality of the dashboard and the speed at which users can interpret the data. Finally, the visualization results form the basis for strategic decision-making at Rumah Berkebun. Key applications include product prioritization by identifying high-performing products for promotional focus, designing customized marketing campaigns based on seasonal trends and customer preferences, and market expansion by targeting geographic regions with high sales potential for growth opportunities. By leveraging insights from the interactive BI-based dashboard, stakeholders can develop strategies that improve operational efficiency and business profitability. This BI approach ensures that decisions are based on accurate, measurable, and relevant data, providing a competitive advantage in the e-commerce landscape.

4. Result and Discussion

4.1 Results

Rumah Berkebun sales data on Shopee for the past two years has been analyzed. Interactive visualizations have been created using Business Intelligence (BI) methods. Through user-friendly dashboards developed with Google Data Studio, critical insights are provided. These insights include total monthly sales, the products with the highest contribution to revenue, and customer distribution by region. For instance, the interactive visualization panel highlights that the best-performing products are durian seedlings and avocado seedlings, which account for nearly half of total sales over the past two years. Additionally, seasonal sales trends offer valuable guidance for Rumah Berkebun in planning more targeted inventory management and promotions. For example, offering special discounts during low-sales months. This study demonstrates that a Business Intelligence-based approach can significantly contribute to increasing sales revenue and enhancing business competitiveness in the digital market. The dashboard, as illustrated below, incorporates various types of charts, including Bar Charts, Line Charts, Combination Charts, Geographic Charts, Pie Charts, and Stacked Bar Charts. This dashboard simplifies the interpretation of product sales information for readers and facilitates the analysis process for stakeholders, enabling more effective decision-making.

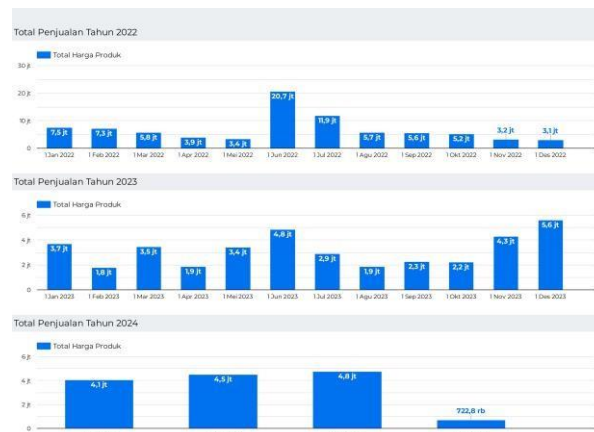


Figure 2. Chart of Total Sales per Year

This chart presents total sales over two years (2022 and 2023) and up to April 2024, measured in millions of Indonesian Rupiah (IDR). In 2022, the highest sales were recorded in June at IDR 20.7 million, while the lowest occurred in April (IDR 3.9 million), November (IDR 3.2 million), and December (IDR 3.1 million). In 2023, the peak sales were in December at IDR 5.6 million, with the lowest in February at IDR 1.8 million. For 2024, data is available only up to April, with the highest sales in March at IDR 4.8 million and the lowest in April at IDR 722,800. The start of 2024 shows a more stable trend compared to the same period in 2022 and 2023, despite a sharp decline in April. Significant sales spikes in specific months, such as June 2022 and December 2023, are likely influenced by seasonal factors such as harvest periods or major promotions. Conversely, declines in months like April and November 2022, February 2023, and April 2024 suggest the impact of unidentified external or internal factors. This study recommends further research into the correlation between seasonal patterns and effective promotional strategies to boost sales during underperforming months.

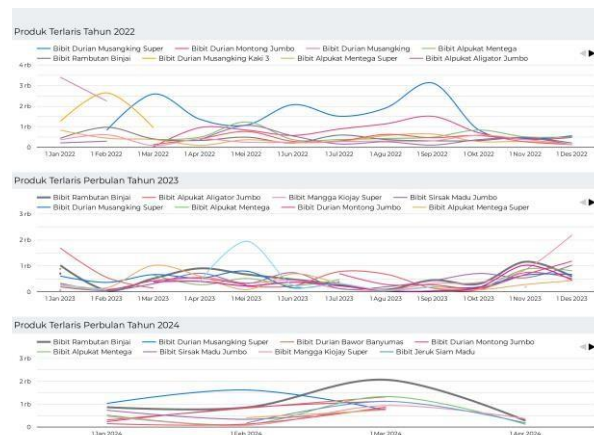


Figure 3. Chart of Best-Selling Products per Month

This graph visualizes the sales trends of best-selling products from 2022 to 2024, with data separated by year. It reflects sales patterns for various horticultural products, including durian seedlings, avocado, mango, rambutan, and others. In 2022, Musangking Super Durian Seedlings were the top sellers, particularly from May to September, while products like Binjai Rambutan Seedlings and Jumbo Alligator Avocado Seedlings showed stable but relatively low sales trends. In 2023, sales patterns indicated more balanced competition compared to the previous year. Certain products, such as Kiojay Super Mango Seedlings and Jumbo Honey Soursop Seedlings, see significant increases in specific months, especially towards year-end. In 2024, the focus shifted to products like Bawor Banyumas Durian Seedlings and Honey Siamese Orange Seedlings, which exhibited more stable sales trends. Peak sales for items like Montong Jumbo Durian Seedlings were observed from March to April. This graph highlights seasonal trends, particularly for durian, which tend to peak mid-to-late year in 2022 and 2023. Key findings reveal a shift in market preferences: 2022 was dominated by Musangking Super Durian Seedlings, while 2023 and 2024 show greater product diversification. This diversification presents an opportunity for sellers to refine marketing strategies by adjusting inventory and promotions for products with strong seasonal trends. Previous studies also emphasize the importance of diversification as a risk mitigation strategy against declining sales of specific products.

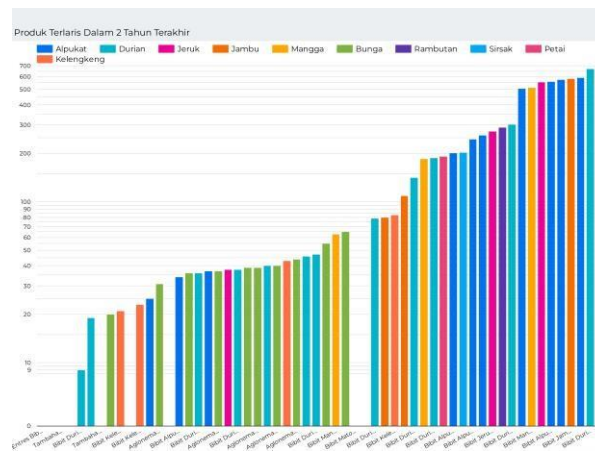


Figure 4. Chart of Best-Selling Products in the Last 2 Years

This combination chart displays sales data for best-selling products over the past two years across categories such as Avocado, Durian, Orange, Guava, Mango, Flower, Rambutan, Soursop, and Petai. Each color on the chart represents a different product category, with Durian, Avocado, and Guava dominating sales (indicated by taller bars), while categories like Flower and Soursop show lower sales. Sales of certain products significantly outpace others. For example, Avocado and Durian categories hold the top positions, reflecting consistently high market demand, whereas products like Flowers and certain types of Soursop may cater to more niche or seasonal markets. Practically, the dominance of Avocado and Durian offers an opportunity to prioritize these products through intensive promotions, especially during high-demand periods. Conversely, lower-performing categories like Flowers could be targeted for market diversification or niche market development. Academically, these findings are relevant to market preference analysis, supporting the theory that consumer demand is influenced by seasonal factors, local preferences, and effective promotions.

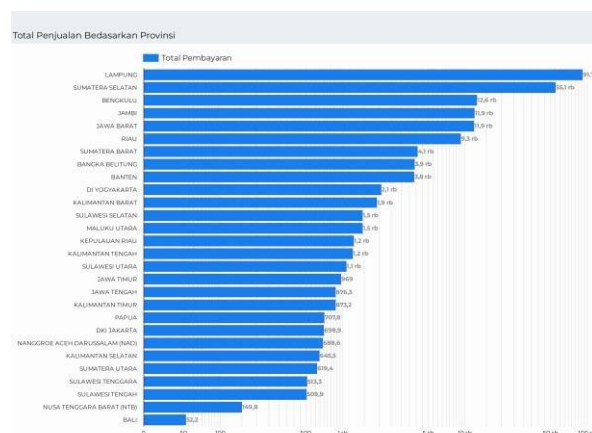


Figure 5. Graph of Total Sales by Province

This horizontal bar graph illustrates total sales by province in Indonesia. Lampung recorded the highest sales at 97.7 thousand, followed by South Sumatra at 93.2 thousand, and Bengkulu at 72.6 thousand. Provinces like Jambi, West Java, and West Sumatra showed moderate sales ranging from 40 thousand to 60 thousand. In contrast, provinces such as West Nusa Tenggara (NTB), Bali, and West Sulawesi had the lowest sales, each below 10 thousand, with Bali at the bottom at just 5.0 thousand. This research not only outlines geographic distribution but also provides insights into potential factors influencing sales variations across regions. Factors such as accessibility, income levels, and local product preferences are likely to play significant roles in shaping sales patterns. Recommended strategies include intensifying marketing campaigns in low-sales regions and tailoring products to local preferences. Previous studies suggest that a focused geographic approach can increase market share in regions with growth potential.



Figure 6. Geographic Map of Total Sales

This geographic map depicts the distribution of sales across regions in Indonesia. Dots on the map represent locations with specific sales contributions, where the size and color intensity of the dots indicate sales volume. Larger and darker dots signify higher sales in those regions. The largest sales concentrations are evident in southern Sumatra and western Java, as shown by the dominant dot sizes. The map offers insights into high-sales regions like South Sumatra and West Java, which can be sustained through targeted promotional and customer service strategies. Conversely, regions with low sales contributions, such as Papua, require innovative approaches to increase market share. This analysis aligns with regional marketing theory, which underscores the importance of adapting strategies based on geographical characteristics.

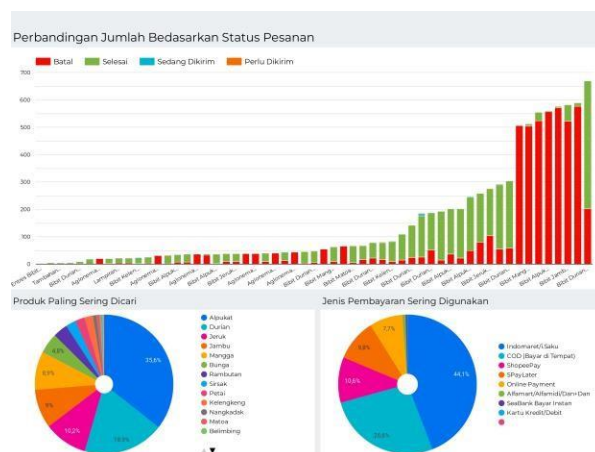


Figure 7. Comparison Chart of Product Category and Payment Type

This visualization includes data on order status, most-searched products, and commonly used payment methods. The bar chart shows that the "Completed" status dominates total orders across product categories, indicating a high rate of successful transactions. However, the "Canceled" status is also notable in some categories, reflecting a significant volume of failed or buyer-canceled orders. The pie chart reveals that Avocado dominates searches at 35.6%, followed by Durian at 16.0% and Orange at 12.6%. For payment methods, Indomaret/i.Saku leads with 44.1%, followed by COD (Cash on Delivery) at 26.6%. Other methods, such as ShopeePay, instant bank transfers, and credit/debit cards, account for smaller percentages. This research offers practical insights for store managers to enhance customer experience, such as providing clearer payment information or improving stock management for popular products. Academically, the findings support the concept that flexible payment options significantly influence purchasing decisions.



Figure 8. Graph of Order Differences and Cancellation Reasons

This graph analyzes order status (completed and cancelled) and reasons for cancellations. The majority of cancellations were due to "Canceled automatically by Shopee system: Unpaid order," totaling 4,178 cases, indicating issues in the payment process. Other reasons include buyer cancellations due to a change of mind (194 cases), incorrect use of vouchers or promotions (114 cases), and delivery issues like address changes (104 cases).

4.2 Discussion

This study reveals several key insights into the sales performance and strategic opportunities for Rumah Berkebun on the Shopee platform. These insights are derived from the application of Business Intelligence (BI) methods, which have proven instrumental in transforming raw sales data into actionable strategies. The discussion below elaborates on product trends, geographical distribution, operational challenges, and the broader implications of BI implementation for digital market competitiveness. The analysis identifies durian and avocado seedlings as the best-selling products, reflecting strong customer preference for tropical fruit crops. The demand for these products exhibits clear seasonal patterns, with significant spikes observed in June 2022 and December 2023. These spikes are likely corresponding to planting or harvesting seasons. This finding aligns with previous research by Apridonah *et al.* (2023), which emphasizes the importance of aligning inventory and promotional strategies with seasonal demand to maximize sales on e-commerce platforms [2]. For Rumah Berkebun, implementing targeted promotions during peak seasons—such as offering bundle discounts or limited-time offers—could further capitalize on this demand. Moreover, the diversification of product focus in 2024, where emerging products like Siamese orange and Bawor durian seedlings show significant sales potential, underscores the need for a balanced approach between promoting high-demand items and introducing innovative products. This strategy supports the concept of product diversification as a risk mitigation measure, as highlighted by Zahra & Utomo (2023), to prevent over-reliance on a limited range of products [3].

Geographically, the highest sales are concentrated in South Sumatra and Lampung, indicating robust market potential in these regions. This could be attributed to factors such as proximity to agricultural hubs, higher purchasing power, or stronger demand for horticultural products. In contrast, regions like Bali and West Nusa Tenggara recorded notably lower sales, potentially due to logistical challenges, limited market awareness, or differing consumer preferences. These findings resonate with Ghandour (2015), who notes that geographical variations in e-commerce sales are often influenced by accessibility and localized demand patterns [10]. To address disparities, Rumah Berkebun could adopt region-specific marketing campaigns, such as localized promotions or partnerships with regional logistics providers to enhance delivery efficiency in low-sales areas. Additionally, adapting product offerings to suit regional preferences, as suggested by Arfandi *et al.* (2024), could unlock untapped market potential in underrepresented areas [5].

On the operational front, the research highlights that most orders are successfully completed, reflecting effective logistics management by Rumah Berkebun. However, a significant challenge lies in order cancellations, predominantly due to payment failures, with 4,178 cases attributed to unpaid orders being automatically canceled by the Shopee system. This issue points to gaps in the payment process, which could deter customer satisfaction and revenue growth. Fauziah (2020) underscores that seamless payment systems are critical to enhancing sales in online marketplaces like Shopee [15]. To mitigate cancellations, Rumah Berkebun should consider implementing automatic payment reminders and offering diverse, user-friendly payment methods, such as e-wallets or installment options, to accommodate varying customer needs.

Furthermore, educating customers on voucher usage and promotional terms, as suggested by Ramadhani *et al.* (2024), could reduce the cancellations stemming from misunderstandings during checkout [16].

The adoption of BI methods, facilitated by tools like Google Data Studio, has provided substantial benefits in data-driven decision-making for Rumah Berkebun. Interactive dashboards enable real-time visualisation of sales patterns, geographic distribution, customer preferences, and operational bottlenecks, offering strategic clarity for business planning. This aligns with Chaudhuri *et al.* (2011), who argue that BI technologies empower organizations to extract actionable insights from complex datasets, enhancing competitiveness in dynamic markets [8]. For instance, dashboards reveal critical metrics such as monthly sales trends and product performance, which inform inventory management and promotional planning. Moreover, as noted by Pendawa (2023), BI-driven visualizations simplify complex data interpretation, making them accessible to stakeholders for swift decision-making [4]. By leveraging these insights, Rumah Berkebun can design more effective strategies. These strategies range from optimizing stock levels during peak seasons to tailoring marketing efforts based on regional sales data.

The integration of BI into Rumah Berkebun operations underscores its potential to maintain a competitive edge in the digital marketplace. The ability to analyze and act on data-driven insights positions the business to respond proactively to market shifts, customer behaviors, and operational challenges. This is consistent with Apridonah *et al.* findings. (2023), who advocate for e-commerce platform optimization as a core digital business strategy [2]. Furthermore, the practical application of BI dashboards supports the theoretical framework proposed by Bhutani (2019), which highlights the role of interactive data visualization in enhancing user experience and decision-making efficiency [9]. For Rumah Berkebun, sustained investment in BI tools and data analytics capabilities will be crucial to navigating the evolving e-commerce landscape. This will ensure long-term growth, and fostering innovation in product and marketing strategies.

While this study provides valuable insights, certain limitations must be acknowledged. The analysis is constrained by the scope of data (2022–2024) and the lack of qualitative input on customer motivations behind cancellations or regional preferences. Future research could incorporate qualitative methods, as suggested by Creswell & Poth (2016), to explore the underlying consumer behaviors and complement quantitative BI findings [7]. Additionally, a deeper investigation into external factors influencing seasonal sales spikes—such as economic conditions or competitor activities—could refine strategic recommendations. Expanding the geographical analysis to include emerging markets or untapped regions, as recommended by Hendrawan & Setyanoro (2022), could also provide a more comprehensive view of growth opportunities [20].

5. Conclusion and Recommendations

This study underscores the critical role of Business Intelligence (BI) methods in transforming sales data into actionable insights for strategic decision-making at Rumah Berkebun, a digital-based horticultural business on the Shopee platform. Through the implementation of an interactive dashboard powered by Google Data Studio, the analysis reveals that durian and avocado seedlings are the primary contributors to total revenue. This highlights their significance in the product portfolio. Distinct seasonal demand patterns have been identified, with notable sales peaks in June 2022 and December 2023. These peaks are likely driven by planting or harvesting seasons and major promotional events. These patterns offer valuable opportunities for optimizing inventory planning and designing targeted promotional strategies. Conversely, sales declines in certain months, such as April 2022 and February 2023, signal the need for intensified marketing efforts or special incentives to stimulate demand during low-performing periods.

Geographically, the analysis indicated that South Sumatra and Lampung are the dominant markets, reflecting strong regional demand and logistical advantages. In contrast, regions like Bali and West Nusa Tenggara exhibit significantly lower sales, potentially due to distribution challenges or limited market penetration. These findings provide a foundation for tailoring distribution and marketing strategies to address regional disparities and unlock growth potential in underrepresented areas. Operationally, while the majority of transactions are successfully completed under the "Done" status—indicating effective logistics management—the issue of order cancellations remains a pressing concern. Predominantly caused by payment failures, with over 4,000 unpaid orders automatically canceled by the Shopee system, this challenge necessitates immediate action. Recommendations include the adoption of automatic payment reminders and the expansion of flexible payment options, such as e-wallets or installment plans, to reduce cancellation rates and enhance customer satisfaction.

This research contributes to the fields of BI and e-commerce lies in demonstrating the transformative potential of interactive data visualization in enabling data-driven decision-making. By leveraging BI tools, digital businesses like Rumah Berkebun can enhance operational efficiency, improve strategic planning, and strengthen competitiveness in a dynamic market. This study also emphasizes the importance of integrating geographical analysis and seasonal trend recognition into business planning to optimize resource allocation

and market outreach. From a practical perspective, the findings advocate improved stock management practices, data-informed promotional campaigns, and product diversification to ensure long-term market sustainability. For instance, balancing the focus on high-demand products like durian seedlings with emerging products like Siamese orange seedlings can mitigate risks associated with over-reliance on specific items.

Academically, this research opens avenues for further exploration into the application of BI in addressing e-commerce-specific challenges, such as logistics optimization and personalized customer experiences. For future research, integrating machine learning algorithms into BI visualizations is recommended to uncover more complex demand patterns and predict sales trends with increased accuracy. Additionally, studies could evaluate the effectiveness of BI applications across different sectors or in a global business context. This would broaden the understanding of their scalability and adaptability. Expanding the scope to include qualitative insights into customer behavior and external market factors could also complement the quantitative findings of this study. This would provide a more holistic view of e-commerce dynamics. This research affirms that BI-driven approaches are indispensable for digital businesses aiming to navigate online marketplaces. By addressing operational challenges, capitalizing on market insights, and embracing technological advancements, Rumah Berkebun can sustain its growth trajectory and maintain a competitive edge in the evolving e-commerce landscape.

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