

Sales Data Analysis and Visualization Using Tableau to Support Business Decision-Making

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Abstract

The rapid growth of information technology has generated large volumes of sales data that can be utilized as a valuable source of information to support business decision-making. However, sales data presented in tabular form is often difficult to interpret and analyze efficiently. This study aims to analyze and visualize sales data using Tableau to produce meaningful insights and support data-driven business decision-making. The research employed a quantitative descriptive method using the Superstore dataset consisting of 51,290 sales transactions. The research stages included data collection, data cleaning, data preparation, descriptive analysis, data visualization, and result interpretation. The findings indicate that the Technology category generated the highest sales and profit compared to other categories. The Central region contributed the highest sales performance, while the Phones sub-category recorded the highest sales value. In addition, sales trends showed consistent growth over the observed period. The interactive dashboard developed using Tableau successfully presented business information in an effective and understandable manner, enabling management to understand business performance, identify sales opportunities, and support faster, more accurate, and data-driven decision-making.

Keywords: Business Intelligence, Data Analysis, Data Visualization, Decision Making, Tableau.

1. Introduction

The development of information technology has driven organizations and companies to generate very large volumes of data from various business activities. This data comes from sales transactions, customer interactions, operational activities, up to marketing processes that take place every day. In the current digital era, data is no longer viewed only as an archive, but has become a strategic asset that can be utilized to support business decision-making. However, the increasingly large volume of data often creates challenges in the processing and interpretation process, so organizations need an effective approach to convert raw data into valuable information (Chen et al., 2012; Davenport & Harris, 2007).

Data analytics is one of the approaches widely used to help organizations understand patterns, trends, and relationships between data. Through a systematic analysis process, organizations can obtain insights that support improved operational efficiency, resource optimization, risk reduction, and more precise business strategy planning (Tiwari, 2024). The use of data analytics enables companies to carry out evidence-based decision making, so that the resulting decisions become more accurate and objective compared to decisions based solely on intuition. In addition, the application of data analysis also helps organizations identify new business opportunities and improve competitiveness amid increasingly competitive market conditions (Tiwari, 2024).



In supporting the data analysis process, the concept of Business Intelligence (BI) has developed as an approach that integrates data collection, data processing, analysis, and the presentation of information in a form that is easy for decision-makers to understand. Business Intelligence enables organizations to convert operational data into strategic information that can be used to monitor business performance, identify problems, and determine improvement measures quickly (Park et al., 2021; Shakeel et al., 2022). Therefore, Business Intelligence has become one of the important components in implementing data-based business strategy.

One of the main elements in Business Intelligence is data visualization. Data visualization is the process of presenting data in the form of graphs, diagrams, maps, or interactive dashboards aimed at making it easier for users to understand complex information (Nisa' & Rusdianto, 2024). Data visualization is able to improve the quality of decision-making because it helps users identify patterns, trends, and relationships between variables more quickly compared to presenting data in table form. Other research results also show that data visualization can simplify large amounts of information so that it is easier to understand for various stakeholders (Lande et al., 2024; Panghal, 2024).

The development of data visualization technology has given rise to various Business Intelligence platforms capable of presenting analysis interactively. One widely used platform is Tableau. Tableau provides the ability to connect various data sources, process data, and produce interactive dashboards that support real-time business analysis. Research conducted by Nisa' and Rusdianto (2024) shows that the use of Tableau is able to help organizations obtain business insights quickly through informative and easy-to-understand visualization. In addition, Tableau also enables users to explore data dynamically so that the decision-making process can be carried out more effectively (Nisa' & Rusdianto, 2024).

Several previous studies have utilized Tableau in various fields, such as retail sales analysis, marketplace performance evaluation, product distribution analysis, and company operational monitoring (Lavanya et al., 2023; S. Sharma & Kandel, 2023). The results of these studies show that interactive dashboards are able to help organizations monitor sales trends, evaluate product performance, understand customer behavior, and identify business opportunities. However, most studies still focus on certain data visualizations and have not yet integrated sales trend analysis, profitability, product categories, and regional distribution into one comprehensive dashboard.

Based on these conditions, research is needed that is able to integrate various aspects of sales analysis into an interactive dashboard that can be used as a business decision-making support tool (McAfee & Brynjolfsson, 2012). This study aims to analyze and visualize sales data using Tableau in order to produce information that is easier for management to understand and utilize (Panghal, 2024). The resulting dashboard is expected to provide insight into sales trends, product category performance, profitability, and sales distribution by region (A. Sharma, 2023) so that it can support faster, more accurate, and data-driven business decision-making (Tiwari, 2024).

2. Literature Review

2.1. Business Intelligence

Business Intelligence (BI) is a series of methods, processes, and technologies used to collect, integrate, process, and analyze data into information that is valuable to an organization (Triyanto et al., 2023). The implementation of Business Intelligence enables companies to gain deeper insight into business conditions through the use of structured and integrated data. The resulting information can be used to monitor organizational performance, identify business

opportunities, and support the decision-making process more effectively. In an increasingly competitive business environment, Business Intelligence functions not only as a reporting tool, but also as a means of generating insight that can help organizations develop data-based strategies (Rachmawati & Hasan, 2023; Triyanto et al., 2023). By utilizing Business Intelligence, companies can improve operational efficiency and reduce risk in the decision-making process.

2.2. Data Analysis

Data analysis is the process of processing, evaluating, and interpreting data to obtain useful information. This process aims to find patterns, relationships, trends, and anomalies contained in the data so that they can be used as a basis for decision-making. In this study, data analysis was carried out using a descriptive approach to describe the condition of sales data based on several indicators such as total sales, product category, profit, and sales region. Descriptive analysis helps provide a general overview of the characteristics of the data, making it easier to identify information relevant to business needs. Good data analysis results will produce more accurate information and support the objective decision-making process.

2.3. Data Visualization

Data visualization is the process of presenting data into visual forms such as graphs, diagrams, maps, or interactive dashboards. The main purpose of data visualization is to simplify complex information so that it is easier for users to understand (Park et al., 2021). Through visualization, data that was originally in the form of numbers and tables can be converted into information that is more communicative and easier to interpret.

Data visualization has an important role in helping organizations understand business conditions quickly. With appropriate visualization, users can identify patterns, trends, relationships between variables, and changes in business performance more effectively (Eberhard, 2021). In addition, data visualization also helps improve the quality of information communication between analysts and decision-makers so that the decision-making process can be carried out more quickly and accurately.

2.4. Tableau

Tableau is a Business Intelligence software used to perform data analysis and visualization interactively (Santhi et al., 2021). Tableau is able to integrate various data sources and present them in the form of informative dashboards, making it easier for users to explore data. The advantage of Tableau lies in its ability to produce interactive visualizations without requiring a complex programming process. Users can create various types of graphs, diagrams, geographic maps, and dashboards using the drag-and-drop feature provided by Tableau.

Tableau is able to help organizations understand sales patterns and business profitability through the presentation of information that is easier to understand. A recent study by Waghmare et al. (2025) demonstrated that a Tableau-based sales dashboard designed for a mid-sized retail enterprise improved strategic planning efficiency by 20–30% and reduced decision latency by approximately 40% compared to traditional Excel-based reporting, underscoring Tableau's relevance for retail analytics and strategic decision-making. In addition, Tableau also supports the data analysis process dynamically so that users can explore data based on various different dimensions. In this study, Tableau was used as the main tool for visualizing sales data in the Superstore dataset. The resulting dashboard was used to display information regarding sales trends, profit distribution, product category

performance, and sales region characteristics that can support the business decision-making process.

2.5. Data-Driven Decision Making

Data-driven decision making is an approach that utilizes the results of data analysis as a basis for determining organizational policies or strategies. This approach aims to reduce subjectivity in the decision-making process so that the resulting decisions become more objective and measurable. In the business world, data-driven decision making can be applied to various aspects, such as marketing strategy, inventory management, product development, and company performance evaluation. Information obtained from the results of data analysis enables management to understand business conditions more accurately so that they can take actions appropriate to organizational needs.

The use of interactive dashboards in the data analysis process is able to improve the quality of decision-making because information can be presented quickly, accurately, and in an easy-to-understand manner. Thus, organizations can respond to changes in business conditions more effectively and efficiently. In this study, the results of sales data analysis and visualization using Tableau are expected to produce information relevant to supporting the business decision-making process, particularly in identifying sales trends, leading products, potential regions, and factors that affect company profitability.

3. Methods

3.1. Type of Research

This study uses a quantitative descriptive method. The quantitative descriptive method aims to analyze and describe the condition of data based on the facts contained in the dataset without manipulating the variables studied. This approach is used to obtain information regarding sales patterns, profit, product categories, and sales regions that can support the business decision-making process. Through the quantitative descriptive approach, sales data were analyzed using simple statistical techniques and visualized in the form of an interactive dashboard using Tableau. The visualization results were then interpreted to produce information relevant to business needs.

3.2. Data Source

The data used in this study is the Superstore dataset, which contains sales transaction data from a retail company. The dataset consists of 51,290 transaction data covering information on transaction date, customer, product category, product sub-category, sales region, sales amount, quantity of products sold, discount, and profit. The Superstore dataset was chosen because it has characteristics that comprehensively represent retail business activities, making it possible to conduct various analyses related to company sales performance and profitability.

3.3. Data Collection Technique

The data collection technique used in this study is documentation study. Data were obtained from the Superstore dataset available in CSV format and subsequently used as the object of research. The documentation technique was chosen because the study focuses on processing historical data that is already available, so it does not require direct observation or interviews.

3.4. Research Stages

The research was carried out through several stages shown in Figure 1.

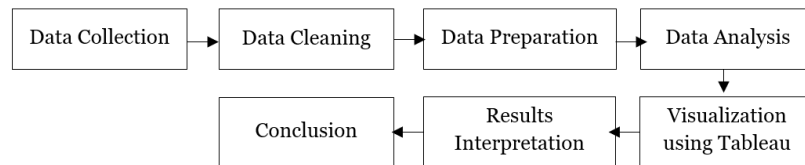


Figure 1. Research Stages

3.4.1. Data Collection

The first stage was carried out by collecting the Superstore dataset containing retail company sales transaction data. The dataset was used as the main source in the analysis process.

3.4.2. Data Cleaning

At this stage, data quality checks were carried out to ensure there was no duplicate data, missing values, or data inconsistencies that could affect the analysis results.

3.4.3. Data Preparation

The data that had been cleaned was then prepared for the analysis process by adjusting the data format, grouping attributes, and creating additional fields if necessary.

3.4.4. Data Analysis

Analysis was carried out to identify patterns and characteristics of sales data based on several main indicators, namely total sales, total profit, quantity of products sold, product category, sales region, and discount level.

3.4.5. Data Visualization Using Tableau

The data that had been analyzed was then visualized using Tableau in the form of an interactive dashboard. The dashboard was designed to display information that is easy for users to understand so that it can help the data exploration process.

3.4.6. Result Interpretation

The final stage was carried out by interpreting the visualization results to obtain business insight related to sales trends, product performance, profitability, and sales distribution by region.

3.5. Data Analysis Technique

The data analysis technique used in this study includes descriptive analysis and data visualization. Descriptive analysis was used to calculate and describe the condition of the data based on predetermined indicators, while data visualization was used to present the analysis results in the form of graphs and interactive dashboards. Several visualizations used in this study include:

- A. Line Chart to display sales trends over time.
- B. Bar Chart to compare sales and profit between product categories.
- C. Pie Chart to show the proportion of product category contributions to total sales.
- D. Geographic Map to display sales distribution by region.
- E. Interactive Dashboard as a medium for integrating all visualizations used in the study.

3.6. Research Flow

The research flow used in this study can be seen as follows: Dataset Collection → Data Cleaning → Data Preparation → Data Analysis → Visualization Using Tableau → Result Interpretation → Conclusion. These stages were carried out sequentially to produce information that can be used as a basis for supporting data-driven business decision-making.

4. Results and Discussion

4.1. Research Results

4.1.1. Dataset Description

This study uses the Superstore dataset containing 51,290 retail company sales transaction data. The dataset covers various important attributes, including product category, product sub-category, sales region, customer, sales amount, profit, quantity of products sold, and discount. Based on the data processing results, the total sales value recorded in the dataset reached 12,642,900, while the total profit obtained was 1,467,457. This data shows that the dataset has a fairly broad scope for use in sales and business profitability analysis.

4.1.2. Sales Analysis Dashboard

The dashboard was built using Tableau to present sales information visually and interactively. The dashboard consists of several main components, namely total sales, total profit, annual sales trends, product categories, product sub-categories, and sales distribution by region.

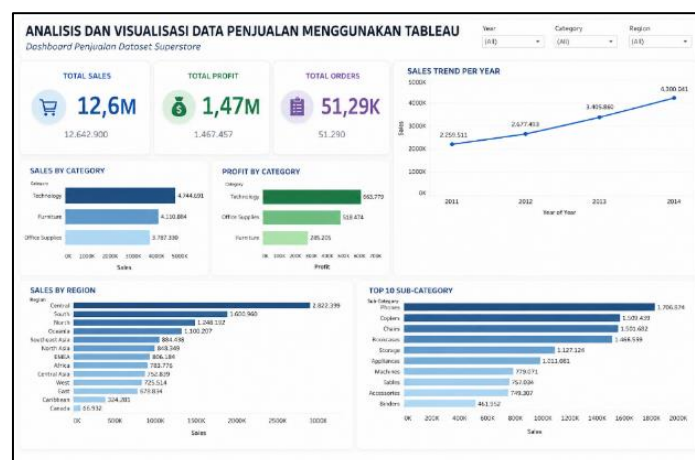


Figure 2. Sales Analysis Dashboard Using Tableau

As shown in Figure 2, the dashboard enables users to obtain business information quickly without having to read transaction data in detail. The information presented can be used as a basis for evaluating sales performance and formulating business strategy.

4.1.3. Sales Trend Analysis

Sales trend analysis was carried out to determine sales development from year to year.

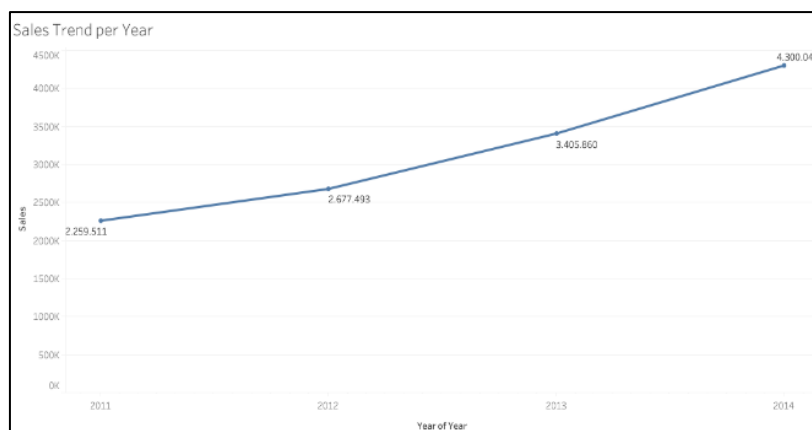


Figure 3. Annual Sales Trends

Figure 3 shows that sales value increased every year. In 2011, total sales were recorded at 2,259,511, then increased to 2,677,493 in 2012. In 2013, sales again increased to 3,405,860 and reached the highest value in 2014 at 4,300,041. The consistent increase in sales indicates positive business growth. This upward trend cannot be attributed to internal business factors alone; it also aligns with broader external conditions during the 2011–2014 period, including the post-2008 recovery of consumer spending in the retail sector and the rapid expansion of e-commerce and online purchasing behavior in the United States during this period, both of which contributed to rising transaction volumes across retail companies of similar scale. This trend indicates that the company is able to improve its sales performance from year to year, thereby having the potential to expand market share and increase company profit.

4.1.4. Sales Analysis Based on Product Category

Product category analysis was carried out to determine the contribution of each category to the company's total sales, the results of which are presented in Figure 4.

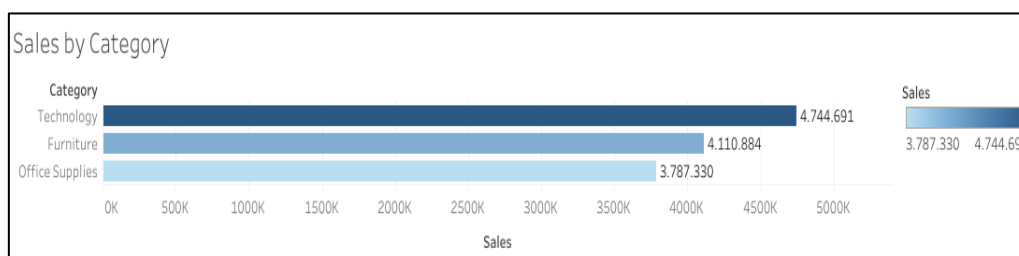


Figure 4. Sales by Product Category

Based on the analysis results, the Technology category generated the highest sales value with total sales of 4,744,691. The Furniture category was in second position with total sales of 4,110,884, while the Office Supplies category generated sales of 3,787,330. These results show that technology products have a higher level of demand compared to other categories. This dominance is likely driven by a combination of factors: technology products such as phones and copiers typically carry a higher unit price than furniture or office supplies, so even a relatively small number of units sold can generate a disproportionately large share of total revenue. In addition, technology items generally have shorter replacement cycles due to fast-changing specifications and obsolescence, which encourages more frequent repurchasing, while corporate and institutional buyers tend to purchase technology products in bulk to support operational needs. Therefore, the company can consider increasing stock and marketing strategy for the Technology category to maintain its sales contribution.

4.1.5. Profit Analysis Based on Product Category

In addition to sales, profit is an important indicator in measuring business success, as visualized in Figure 5.

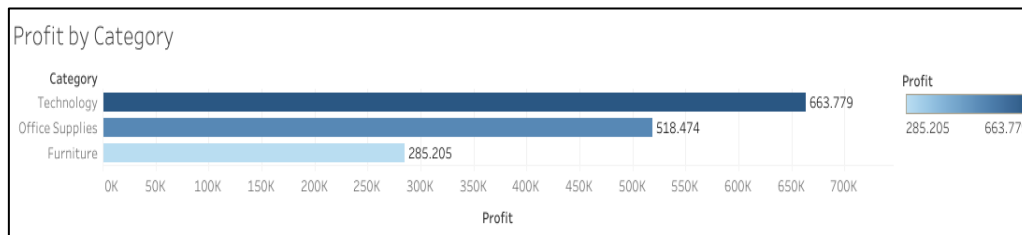


Figure 5. Profit by Product Category

The analysis results show that the Technology category provided the highest profit of 663,779. Next, the Office Supplies category generated a profit of 518,474, while the Furniture category generated a profit of 285,205. These findings indicate that a high sales value is not always directly proportional to the profit obtained. The relatively low profitability of the Furniture category despite its strong sales performance can likely be explained by its higher logistics burden, large and bulky items such as tables and bookcases incur greater shipping and handling costs, as well as its greater exposure to discounting, since furniture is more often sold through negotiated or promotional pricing than technology products. This suggests that sales volume alone is an insufficient indicator of category performance, and profitability should be weighted more heavily in inventory and pricing decisions. Therefore, companies need to pay attention to the profitability level of each product category in determining business strategy and resource management.

4.1.6. Sales Analysis Based on Region

Regional analysis was carried out to identify areas that provide the largest sales contribution.

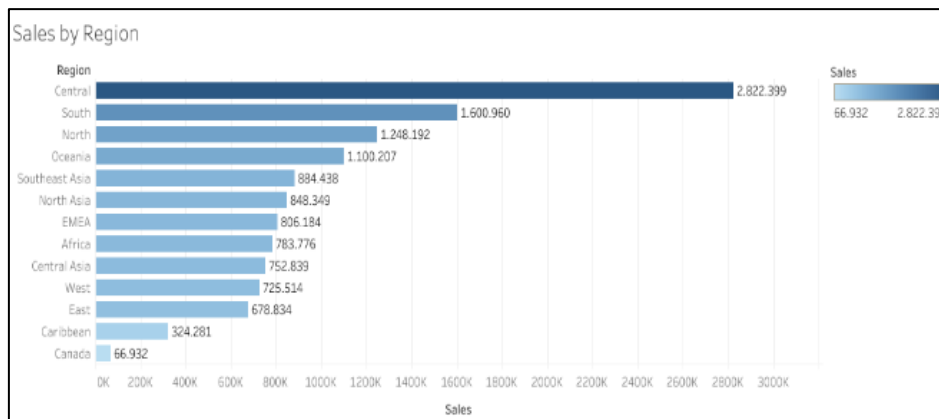


Figure 6. Sales Distribution by Region

Figure 6 indicates that the Central region is the region with the highest sales, namely 2,822,399. The next position is occupied by South with a sales value of 1,600,960 and North at 1,248,192. In addition, the Oceania and Southeast Asia regions also show fairly large sales contributions. The dominance of the Central region is consistent with findings in regional retail literature, which show that a region's retail performance is strongly influenced by market size, accessibility, and its position within the broader regional hierarchy, central or more accessible markets tend to draw higher demand and higher retail productivity than peripheral

ones (Öner, 2018). This suggests that the Central region's leading sales position likely reflects a larger customer base, denser distribution and logistics infrastructure, and greater market accessibility relative to other regions, rather than product mix alone. This information can be used by companies to determine priority regions in marketing strategy and market development. Regions with high sales can be maintained through improved service quality, while regions with low sales can become the focus of business evaluation and development.

4.1.7. Best-Selling Product Analysis

Product analysis was carried out to determine the sub-categories that provide the largest contribution to sales.

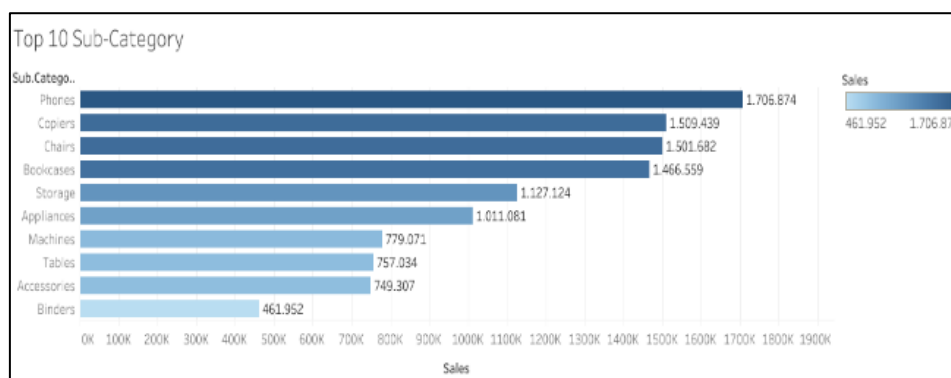


Figure 7. Top 10 Subcategories by Sales

Figure 7 shows that the analysis results show that the Phones sub-category is the product with the highest sales at 1,706,874. This is followed by Copiers at 1,509,439 and Chairs at 1,501,682. Other sub-categories that also provide a large contribution are Bookcases, Storage, Appliances, Machines, Tables, Accessories, and Binders. These findings indicate that technology products remain the main contributor to the company's sales activities. This information can be used to determine procurement priorities, promotional strategy, and product development that aligns with market needs.

4.1.8. Implications for Business Decision-Making

The visualization results produced through Tableau show that sales data can be converted into information that is easy to understand and used in the business decision-making process. The dashboard built is able to present information regarding sales trends, leading product categories, product profitability, and sales distribution by region more effectively compared to conventional reports.

Through this analysis, companies can identify the product categories that contribute most to sales and profit, prioritize key markets, and evaluate the effectiveness of existing strategies. Tableau-based data visualization can therefore serve as an effective decision-support tool, enabling faster and more accurate strategic decisions. Based on the findings, the company should strengthen inventory and supplier management for Phones and Copiers, maintain its focus on the Central region, and intensify demand-generation efforts in the South and North while cautiously exploring Oceania and Southeast Asia. For Furniture, the company should optimize pricing and shipping costs and consider bundling it with higher-margin Office Supplies. Overall, inventory, marketing, and sales strategies should be aligned with market trends and projected growth to maximize profitability.

4.2. Discussion

The findings of this study are broadly consistent with prior research on the role of data visualization in supporting business decision-making. The finding that Tableau-based dashboards make sales information easier to interpret and act upon aligns with Eberhard (2021), who found through a systematic literature review that visualization generally improves the speed and accuracy of judgment and decision-making compared to raw tabular data. Similarly, Nisa' and Rusdianto (2024) argue that data visualization plays a significant role in improving the quality of business decisions, a conclusion mirrored in this study's dashboard, which was able to consolidate sales trends, category performance, and regional distribution into a single interactive view.

The result showing that Technology is the leading category in both sales and profit reinforces the broader argument by McAfee and Brynjolfsson (2012) that organizations able to convert transactional data into actionable insight, in this case, identifying which product categories drive the most value, gain a measurable strategic advantage over competitors relying on traditional reporting. This is also consistent with Panghal's (2024) case study of D-Mart, which found that category-level visualization directly informed inventory and marketing prioritization decisions in a retail setting comparable to this study's context. The dominance of the Central region observed in this study parallels the findings of Öner (2018), who demonstrated that regional retail productivity is closely tied to market size and a region's position within the broader regional hierarchy. This suggests that the regional sales patterns identified in the Superstore dataset are not unique to this case but reflect a more general pattern documented in the retail geography literature.

More broadly, this study's use of Tableau to support business decision-making is consistent with several prior applications of the platform across different domains, such as student graduation prediction (Santhi et al., 2021), flood disaster impact visualization (Triyanto et al., 2023), and cause-of-death data analysis (Rachmawati & Hasan, 2023). While these studies differ in application area, they collectively support the same underlying conclusion reached in this research: that Tableau is a flexible and effective tool for transforming complex datasets into visualizations that facilitate faster and more informed decision-making (Chen et al., 2012; Davenport & Harris, 2017; Sharma & Kandel, 2023). Taken together, these comparisons suggest that the results of this study are not only internally consistent but also reinforce a growing body of evidence, both in retail-specific research (Panghal, 2024; Waghmare et al., 2025) and in the broader business intelligence literature (Lande et al., 2024; Tiwari, 2024), that interactive dashboards meaningfully improve the accessibility and usability of sales data for strategic decision-making.

5. Conclusion

This study successfully carried out sales data analysis and visualization using Tableau by utilizing the Superstore dataset consisting of 51,290 sales transactions. The analysis process was carried out through the stages of data collection, data cleaning, data preparation, descriptive analysis, and data visualization in the form of an interactive dashboard. The visualization results show that Tableau is able to present sales information in a way that is easier to understand and effectively supports the data exploration process. Based on the analysis results, the Technology category is the category with the highest sales value of 4,744,691 and also generated the largest profit of 663,779. In addition, the Central region is the region with the highest sales contribution of 2,822,399. At the sub-category level, the Phones product is the product with the largest sales value compared to other sub-categories.

Sales trend analysis also shows a consistent increase in sales from 2011 to 2014, indicating positive business growth.

The dashboard built using Tableau is able to integrate various important indicators such as total sales, total profit, number of transactions, product category, sales region, and best-selling products into one informative display. This information can help management understand business conditions quickly, identify opportunities to increase sales, and determine more appropriate business strategies based on available data. It should be noted that this study relies on the publicly available Superstore dataset, a simulated dataset rather than actual company transaction data, so the findings should be interpreted as illustrative of Tableau's analytical capability rather than a validated real-world business case. Future research applying this framework to real organizational data is recommended.

Thus, this study proves that the implementation of Tableau as a data visualization tool can support more effective, fast, and data-driven business decision-making. The results of this study are expected to serve as a reference for organizations or companies that want to utilize Business Intelligence and data visualization to improve the quality of decision-making.

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