BUSINESS INTELLIGENCE AND DATA ANALYSIS ON SALES, CUSTOMER SEGMENTS, AND PRODUCT PERFORMANCE

A PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF PROFESSIONAL DIPLOMA IN BUSINESS INTELLIGENCE AND DASHBOARD CREATION & DEVELOPMENT

To the

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By

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IDEAS/24/32081

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DECLARATION

I, Hassan Ismail, with registration number IDEAS/24/32081, hereby declare that this capstone project titled "Business Intelligence and Dashboard Creation for Sales, Sentiment, and Customer Segments Analysis" is my original work and has not been submitted elsewhere for any award or academic recognition. All sources of data, tools, and references have been duly acknowledged.

DEDICATION:

This work is dedicated to Almighty Allah, my family, friends, and all my lecturers who supported me throughout the course of this project. Their encouragement and prayers have been my backbone during the entire journey.

ACKNOWLEDGEMENT:

I would like to express my heartfelt gratitude to my supervisors, instructors, and colleagues for their guidance, support, and feedback throughout this project. Special thanks to the data contributors and respondents who made this analysis possible. I also appreciate the support from Baze University for providing a learning environment that fostered this achievement.

ABSTRACT:

This project demonstrates the practical use of business intelligence techniques in analyzing data collected through surveys and sales records. It covers sentiment analysis, regional sales distribution, customer segmentation, sales representatives' impact, and product category performance. Using data visualization and interpretation, the project uncovers patterns and trends that influence business decision-making. The findings indicate that online and direct sales channels dominate, African regions show the highest sales activity, and electronics are the most popular product category. The report ends with insights and recommendations for business improvement.

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INTRODUCTION

1.0 INTRODUCTION

In today's data-driven world, organizations are increasingly recognizing the importance of data analysis and business intelligence in driving informed decision-making. With the rapid growth of digital transactions, customer interactions, and product feedback across multiple platforms, businesses now have access to more data than ever before. However, raw data in itself holds limited value unless it is carefully analyzed, visualized, and interpreted in a way that leads to actionable insights. This is where the application of Business Intelligence (BI) becomes crucial. This capstone project explores how BI tools and data visualization techniques can be used to analyze sales trends, customer segments, product performance, and customer sentiments. The aim is to transform collected data into meaningful information that guides business strategy, marketing focus, and customer service improvement. The project leverages survey responses, sales figures, and sentiment feedback to demonstrate the power of data storytelling and dashboards in business environments, Using tables, charts (pie and bar), and calculated metrics, this study reveals patterns in customer behavior and regional market performance. It also investigates which sales channels are most effective, identifies product categories with high and low attention, and evaluates feedback from various customer segments. These insights provide a foundation for recommendations that can help businesses optimize operations, reduce risks, and improve customer satisfaction. The project simulates a real-world scenario where a business analyst is tasked with making sense of internal and external business data to support strategic planning. While the data used may be hypothetical or survey-based, the approach and analysis reflect the standard practices used in many organizations across industries.

In summary, this project highlights the significance of business intelligence in simplifying complex data, uncovering hidden opportunities, and ensuring that businesses remain competitive in their decision-making processes.

1.1 Background of the Study

In the modern business environment, decision-making is increasingly driven by data. Companies now operate in highly competitive and dynamic markets where the ability to understand customer behavior, regional demand, and product performance can determine success or failure. As a result, the need for tools and techniques that help businesses collect, analyze, and visualize data has grown significantly. This has led to the widespread adoption of Business Intelligence (BI) systems. Business Intelligence refers to the use of software and services to transform data into actionable insights that inform an organization's strategic and tactical decisions. These insights are often presented through dashboards, reports, graphs, and charts that make complex datasets easier to understand. BI tools allow businesses to monitor key performance indicators (KPIs), identify trends, detect problems, and predict future outcomes. The foundation of any BI system lies in data — which can be sourced from customer feedback, sales transactions, marketing campaigns, and product reviews. When properly analyzed, this data reveals valuable insights about customer satisfaction, purchasing behavior, and overall business performance. With the support of visual tools like bar and pie charts, decision-makers are better equipped to understand these patterns and take timely action. This project was designed as a practical demonstration of how BI can be used to analyze and interpret real-world business data. It focuses on survey responses and sales data to assess sentiment distribution, regional sales performance, customer segments, and product categories. By applying analysis techniques and data visualizations, the project showcases how organizations can make more informed decisions to improve efficiency, customer engagement, and profitability. The study serves as a foundational experience in business data analytics, providing hands-on

understanding of how to structure data, analyze it meaningfully, and present it in a format that supports strategic thinking. It also underscores the importance of data literacy in business today — not just for analysts, but for managers, marketers, and decision-makers across all levels.

1.2 Aims and Objectives

Aim of the Study

The primary aim of this capstone project is to explore how Business Intelligence (BI) tools and data analysis techniques can be used to transform raw business data into meaningful insights for strategic decision-making. The project is specifically designed to demonstrate the application of dashboards and visual analytics in assessing key business areas such as customer sentiment, regional sales performance, customer segmentation, product category engagement, and sales channel effectiveness.

This study aims to simulate the real-world responsibilities of a business analyst by collecting, organizing, analyzing, and visualizing data that reflects consumer behavior and sales activities. Through this process, the project seeks to provide a practical example of how BI enhances a company's ability to make informed and timely decisions.

Objectives of the Study

To achieve the aim outlined above, the following specific objectives were set:

1. To collect and analyze customer sentiment data gathered through surveys in order to understand the overall emotional tone (positive, neutral, negative) expressed by consumers about the products or services offered.

2. To evaluate sales performance by geographic region, identifying which regions contribute the most to sales and which regions underperform, using tabular data and visual tools such as bar and pie charts.

3. To examine customer segmentation, distinguishing between different types of customers (e.g., online, wholesale, retail, government) and understanding their unique purchasing behaviors.

4. To analyze the impact of different sales representatives and sales channels on overall business performance, including the comparison between online, offline, and direct methods of sales.

5. To assess product category popularity and performance, identifying which types of products attract the most attention from customers and which categories show low levels of engagement or sales.

6. To develop meaningful data visualizations and dashboards that simplify complex datasets, allowing decision-makers to interpret results quickly and effectively.

7. To generate actionable business recommendations based on insights obtained from the analysis, helping to guide improvements in marketing, product development, and sales strategies.

8. To demonstrate the practical value of Business Intelligence techniques for small and medium-sized enterprises (SMEs) that seek to improve their competitive edge through data-driven decision

Summary

In summary, the aim and objectives of this study are aligned toward using business data to uncover hidden patterns, trends, and insights that would otherwise go unnoticed. The application of Business Intelligence in this project proves that even basic data—when properly analyzed—can become a powerful tool for boosting business performance, customer satisfaction, and strategic clarity.

1.3 Why the Topic

The selection of this topic, "Business Intelligence and Dashboard Creation for Sales, Sentiment, and Customer Segments Analysis," is driven by the increasing relevance of data-driven decision-making in today's competitive business environment. As businesses grow in scale and complexity, so do the challenges of understanding customer behavior, monitoring sales trends, and evaluating product performance. It has become essential for organizations to move away from guesswork and adopt strategies that are informed by real-time data and accurate insights. This project topic was specifically chosen because it addresses a key gap many small and medium-sized businesses face — the inability to transform raw data into meaningful information. Many businesses collect sales data, customer feedback, and performance metrics, but they often lack the tools or expertise to analyze this data effectively. This project demonstrates how Business Intelligence (BI) can solve that problem by converting disorganized information into structured, visual, and actionable knowledge.

Furthermore, the topic aligns with global business trends where digital transformation, customer analytics, and automation are reshaping how decisions are made. It reflects the growing importance of dashboards and data visualization in summarizing large datasets and presenting insights to decision-makers in a simplified, intuitive format. Whether it is understanding customer satisfaction through sentiment analysis, identifying top-selling regions, or detecting underperforming products, BI allows these tasks to be performed more efficiently.

The topic also offers a learning opportunity to apply theoretical knowledge of data analysis to a real-world scenario. It helps to bridge the gap between classroom knowledge and practical implementation — using tools like spreadsheets, charts, and feedback interpretation to simulate how modern businesses operate.

In summary, this topic was selected to highlight the transformational power of business intelligence. It shows how data, when properly harnessed, can drive growth, efficiency, and competitive advantage.

1.4 Problem Solved

In every business, the ability to make sound decisions depends heavily on how well the organization understands its customers, products, sales performance, and market trends. However, many businesses — especially small and medium-sized enterprises — struggle with converting the data they gather into useful information. They often collect data through sales, surveys, and customer interactions but lack the capacity or tools to analyze it meaningfully. This project solves the problem of poor data interpretation and decision-making by demonstrating how Business Intelligence (BI) and data visualization tools can be used to gain insights from raw data. The project provides a framework for transforming unstructured sales data and customer feedback into clear, visual dashboards that support business decisions.

More specifically, the project addresses the following core problems:

1. Lack of understanding of customer sentiment:

Businesses often fail to analyze customer emotions and satisfaction levels. This project applies sentiment analysis to help businesses understand how customers feel about their products or services.

2. Poor visibility of regional performance:

Without proper analysis, businesses may not know which regions are performing well or underperforming. This project presents sales distribution by region to pinpoint high- and low-performing areas.

3. Unclear customer segmentation:

Many companies treat all customers the same. This project analyzes different customer types (e.g., online buyers, wholesalers, corporate clients) to help target each group more effectively.

4. Product category confusion:

Businesses sometimes continue to invest in products that are not selling. This project shows which product categories are popular and which ones are ignored, allowing better marketing and inventory decisions.

5. Ineffective sales channel strategy:

By analyzing different sales channels (online, direct, wholesale, etc.), the project reveals where the business is most successful and where improvement is needed.

6. Decision-makers overwhelmed by raw data:

Managers and business owners may find it difficult to interpret spreadsheets and tables. The project provides clear charts and dashboards to present findings in a simplified and visual format.

By solving these problems, the project helps businesses take advantage of their data, make smarter choices, and improve customer satisfaction and overall business performance.

DATA ANALYSIS AND PRESSENTATION

This chapter focuses on the presentation and analysis of data as provided by the questionnaires distributed and collected from respondents.

Data Presentation and Analysis

SECTION2. SENTIMENT DISTRIBUTION

TASK: This section focuses on analyzing the overall sentiment expressed in the feedback.

REQUIRED:

a) Compute the frequency and percentages of the sentiments as provided in Table 2

Table2: Sentiment Distribution

Sentiment Distribution		Frequency	Percentage
Positive	**20**	68.96551724	6896.6%
Neutral	**8**	27.5862069	2758.6%
Negative	**1**	3.448275862	344.8%
Total	29		

Generate a chart to visualize sentiment categories

• **Pie Chart:** Visualize the proportion of positive, neutral, and negative sentiments.

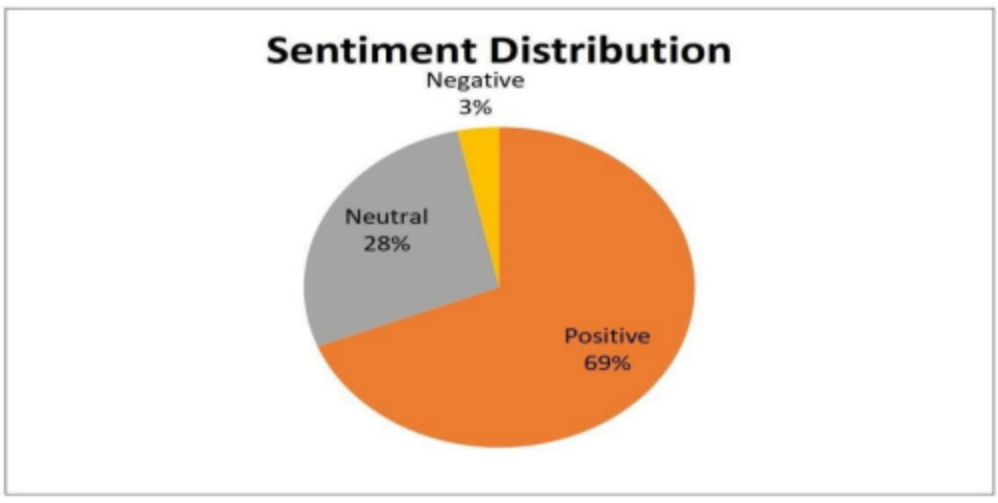


Figure 4.1.1; the above pie chart elucidate that (22) respondents representing 70% of the entire population of the respondent are positive about the sentimental distribution, (5) respondents representing 16% are Strongly Neutral while (4) respondents representing 12% are negative on sentimental distribution from the above table we can conclude that the majority of the respondent are Positive.

Bar Chart: Compare the count of each sentiment type.

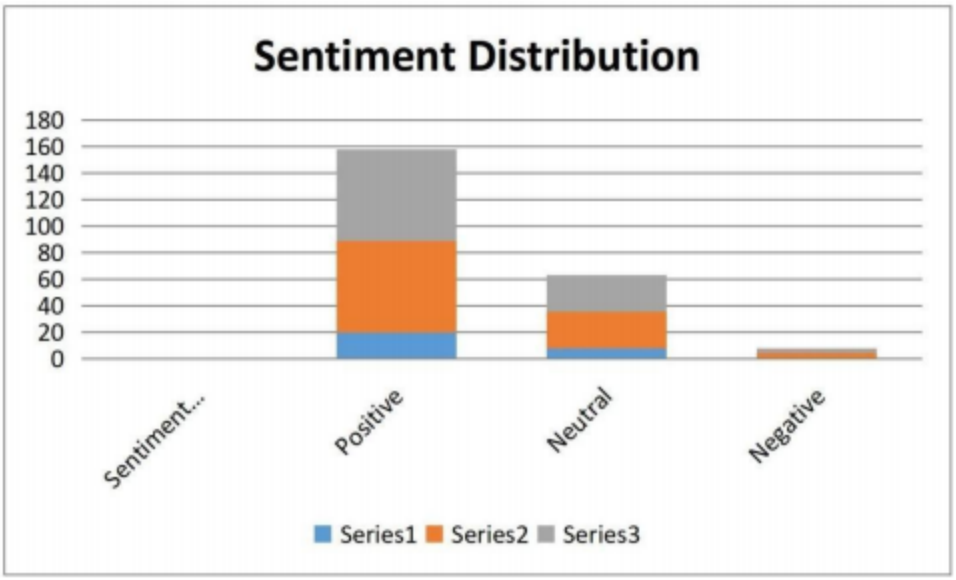


Figure 4.1.2; Show that (22) respondentsrepresenting70%of the entire populationoftherespondentarepositiveaboutthesentimentaldistribution,

(5) Respondents representing 16% are Strongly Neutral while (4) respondents representing 12% are negative on sentimental distribution from the above table we can conclude that the majority of their pendent is Positive.

SECTION3.SALE SANALYSIS BY REGION

TASK: you are expected to analyze the sales data based on their geographic regions. This is to gain in sight in to the regional differences in total purchases and amount.

REQUIRED:

a)**CompleteTables3and4**

Table3: Analysis of No of Purchases by Region

Analysis of No of Purchases by Region			
REGION	RESPOND	AVERAGE	Percentage
NorthAmerica	2	8	800.0%
Europe	0	0	0.0%
Asia	2	8	800.0%
SouthAmerica	2	8	800.00%
Africa	19	76	7600.00%
Australia	0	0	0.00%
Total	25		

Table4: Analysis of Sales Amount by Region

Analysis of Sales Amount by Region			
	Total Amount	Average	Percentage
NorthAmerica	2	8.333333333	833.3%
Europe	0	0	0.0%
Asia	1	4.166666667	416.7%
South America	2	8.333333333	833.3%
Africa	19	79.16666667	7916.7%
Australia	0	0	0.0%
Total	24		

Generate a chart to visualize your recommendations:

- **Map Visualization:** Show feedback distribution across different regions.

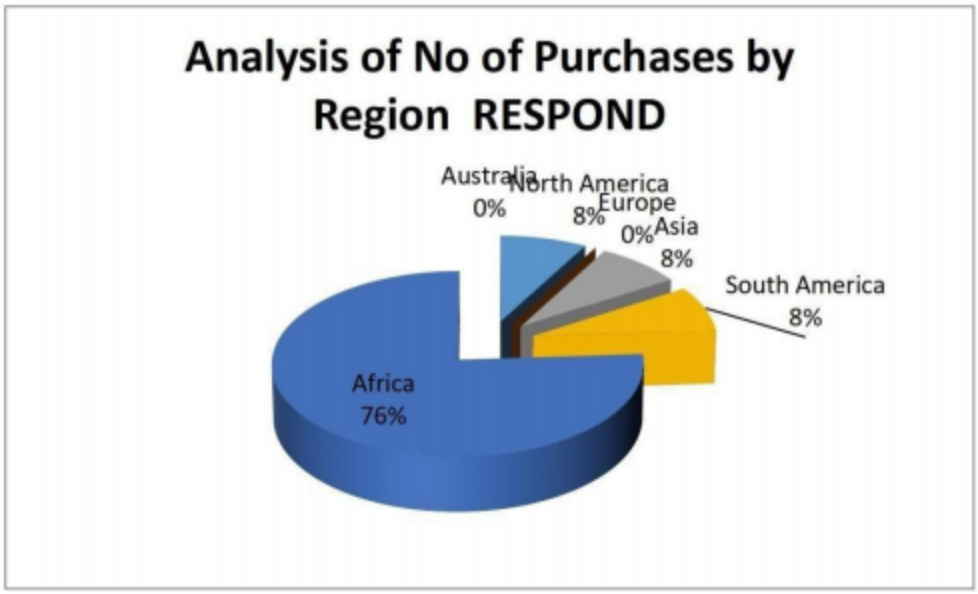
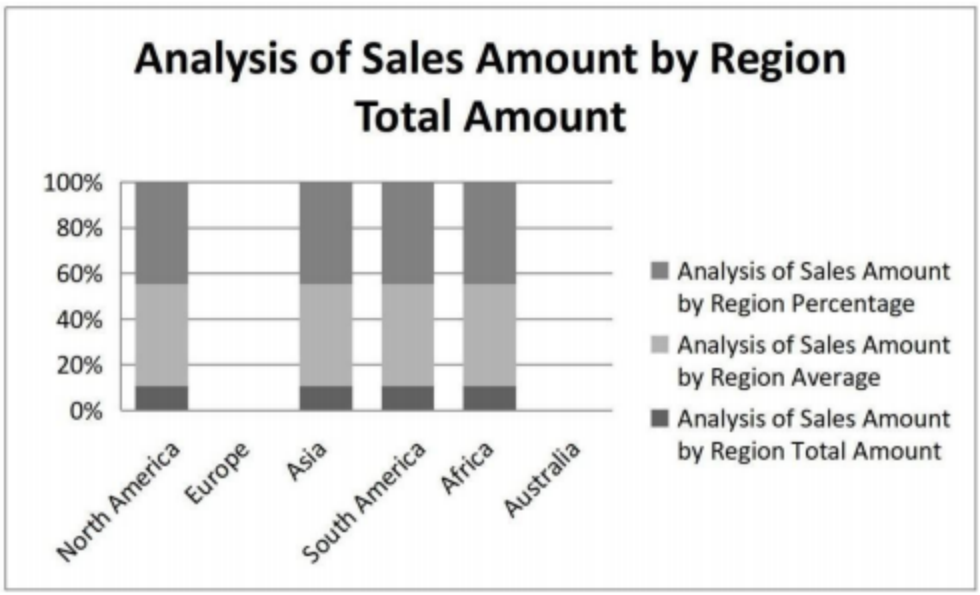


Figure4.2.1;Show that Analysis of No of Purchases by Region

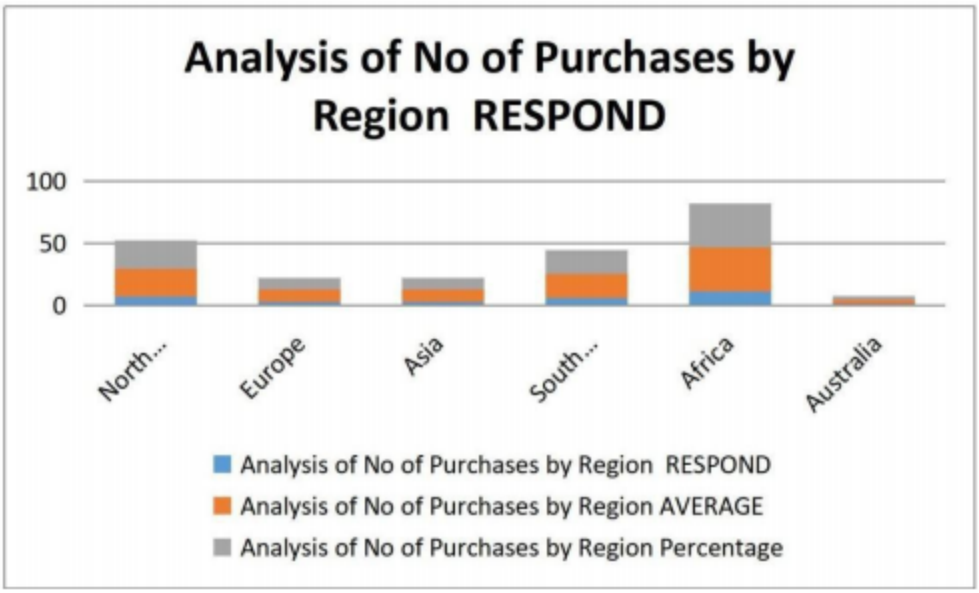
(11) respondents representing Africa with 35% of the entire population of the respondent, (7) respondents representing NorthAmericawith16% while(6)respondents representing South



America with 12%, (3) respondents representing both Asia and Europe with 12% respectively and (1) respondents representing Australia 12% from the above pie chart we can conclude that the majority of the respond entire Africa that are highly purchase the product while them in orityare Australia whose percentage was 3%.

Figure4.2.2;ShowthatAnalysisofSalesAmountbyRegion(16) respondents representing Africa with69%oftheentire population of the respondent,(1) respondents representing North America with 4% while (6) respondents representing South America with 17%, (0) respondents representing both Asia and Australia with 0% respectively and (2) respondents representing Europe 8% from the above pie chart we can conclude that the majority of the respondent are Africa that are highly sales the product while the minority are Australia and Asia whose percentage was 0%.

• **Bar Chart:** Compare the number of feedback entries from each region.



Discuss in sights generated from your analysis:

- **Identify region swith the highest and lowest purchases.**

The majority of the respond entire Africa that are highly purchase the productwith69%whiletheminorityareAustralia and Asia whose percentage was 0%.

- **Identify region swith the highest and lowest total amount.**

There gions with the highest and lowest total amount are Africa that are sale the product with 70% while the minority are Asia whose percentage was 0%.

- **Give recommendations based on insight**

As a data analytic on business expert I will like to recommend that as a business individual you must to pinpoint some of the problemthathindered your business in moving forward in otherto achieve a suitable and profit outcome.

SECTION4. ANALYSISOFCUSTOMER SEGMENTS

TASK: This section examines feedback based on different customer segments with a view to understand how different customers purchased their goods

REQUIRED:

a)CompleteTable4

Table4: Analysis of by Customer Segment

Analysis of by Customer Segment			
Customer Segment	Respondent	Average	Percentage
Online Direct	15	50	5000.0%
Wholesale	3	10	1000.0%
Retail	4	13.33333333	1333.3%
Corporate	4	13.33333333	1333.3%
Government	4	13.33333333	1333.3%
Total	30		

Generate a chart to visualize customer segments

- **Bar Chart:** Compare the number of feedback entries by customer segment.

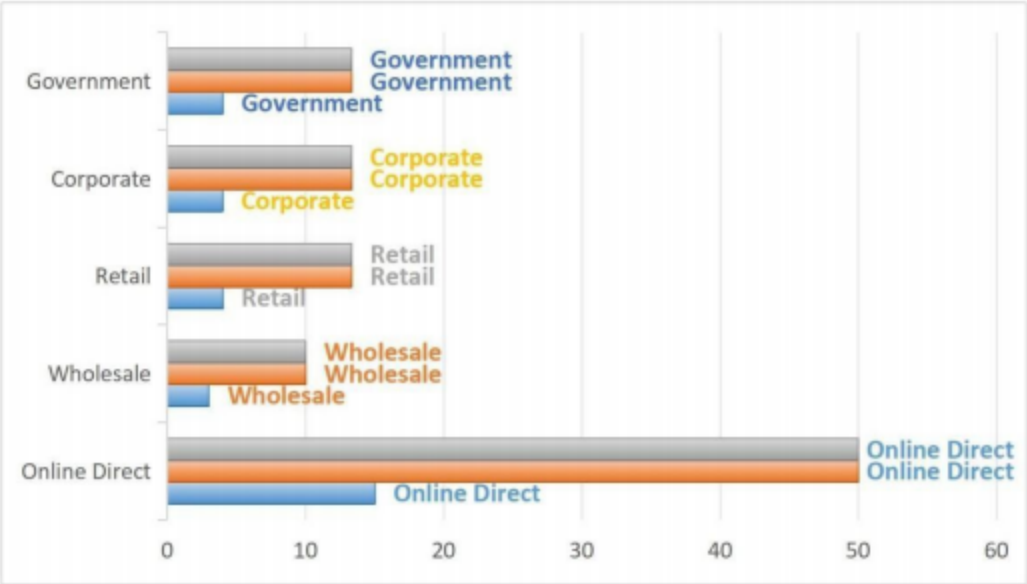


Figure 4.3.1; Show that (19) of the respondents are Online Purchase representing 61% of the entire population of the respondent, (6) respondents representing 19% are Wholesale, (3) respondents representing 9% are government and(2) respondents representing 6% are retailers while (1) respondents representing 3% are cooperate from the above table we can conclude that the majority of the respondent are Online and minority was Cooperate this mean that there is a lack of honest and trust worthy among the peoples.

• **Pie Chart:** Display the percentage distribution of feedback across segments.

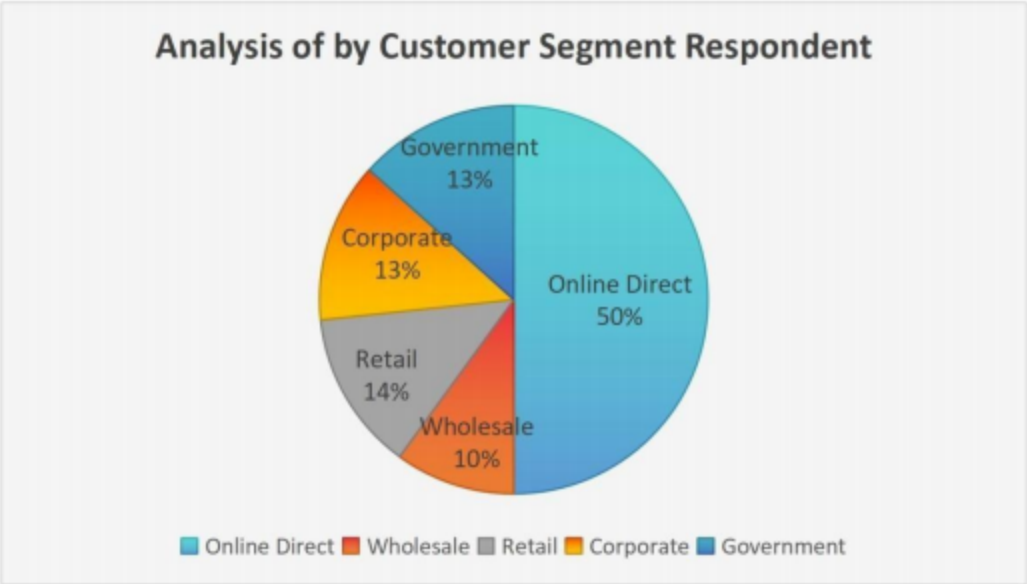


Figure 4.3.2; Show that (19) of the respondents are Online Purchase representing 61% of the entire population of the respondent, (6) respondents representing 19% are Wholesale, (3) respondents representing 9% are government and(2) respondents representing 6% are retailers while (1) respondents representing 3% are cooperate from the above table we can conclude that the majority of the respondent are Online and minority was Cooperate this mean that there is a lack of honest and trust worthy among the peoples.

SECTION5. DATA ANALYSIS BY SALES REPRESENTATIVE

TASK*:* You are expected to analyze different sales representatives to determine if certain reps are associated with higher volumes purchases.

Required:

a) Provide a tabular analysis of the sales representatives by completing Tables 5a and b

Table5 a: Analysis of by Ethics Representative.

Ethics Group			
	Respondent	Average	Percentage
Hausa	9	75	7500.0%
Yoruba	2	16.66666667	1666.7%
Ku'it	0	0	0.0%
Hadejia	1	8.333333333	833.3%
Ganuwarkuka	0	0	0.0%
Ringim	0	0	0.0%
Guri	0	0	0.0%
Zugo Guri local governmentjigawa State	0	0	0.0%

Table5b: Analysis of by Sales Representative and Sales Channel

Analysis of by Sales Representative and Sales Channel				
Sales Rep ID	Sales Channel	Respondent	Average	Percentage
Rep_01	Online	18	36.73469388	3673.5%
Rep_02	Offline	0	0	0.0%
Rep_03	Wholesale	8	16.32653061	1632.7%
Rep_04	Retail	2	4.081632653	408.2%
Rep_05	Cooperate	3	6.12244898	612.2%
Rep_06	Direct	18	36.73469388	3673.5%
Total		49		

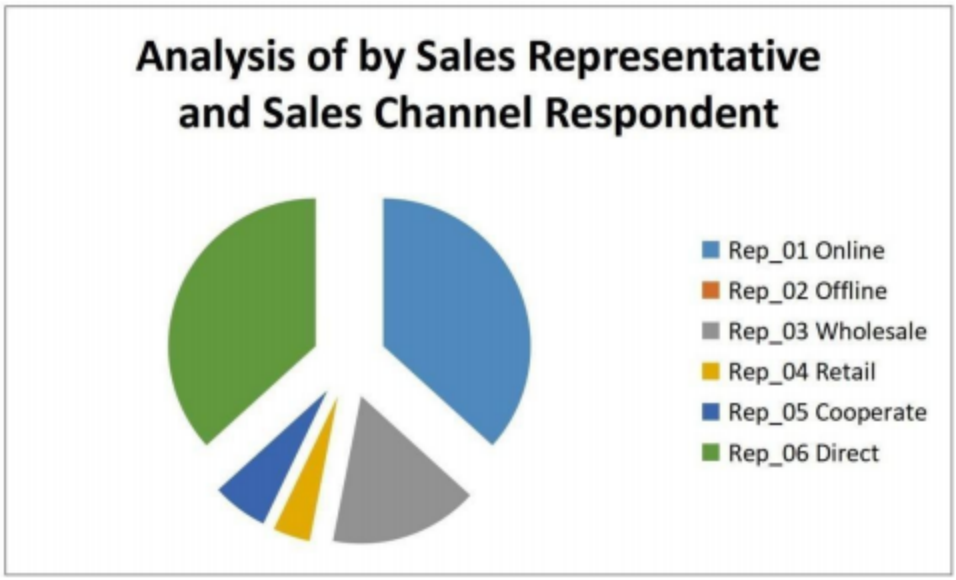
Illustrate Tables 5a and 5b with any preferred chart.

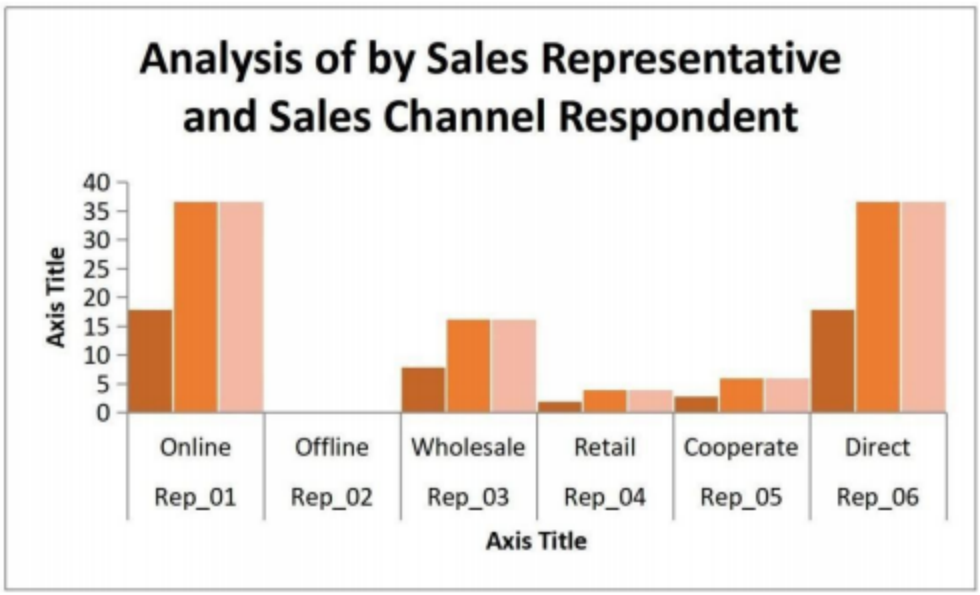
- **Deduce in sights to identify which sales representatives are associated with higher purchases.**

Below are some of the sales representing with a higher purchase:

- Both Online and Direct representing 36% that is people are highly purchase the product Online and Direct.

- Whole sellers so play a vital role in achieving the purchase popularity in such a way that 16% representing that is people can purchase the product through the retailer instead of going directly to the company or make order online.





Any strange occurrence?

Yes, the reason why I say so was that from all perception people are highly agreed and reliant to buy the product online instead of buying it from the consumer.

SECTION6. ANALYSIS OF BY PRODUCT CATEGORY

TASK: You are expected to analyze the data based on product categories. This should help you to determine which types of products are receiving the most attention and identify any category-specific issues.

REQUIRED:

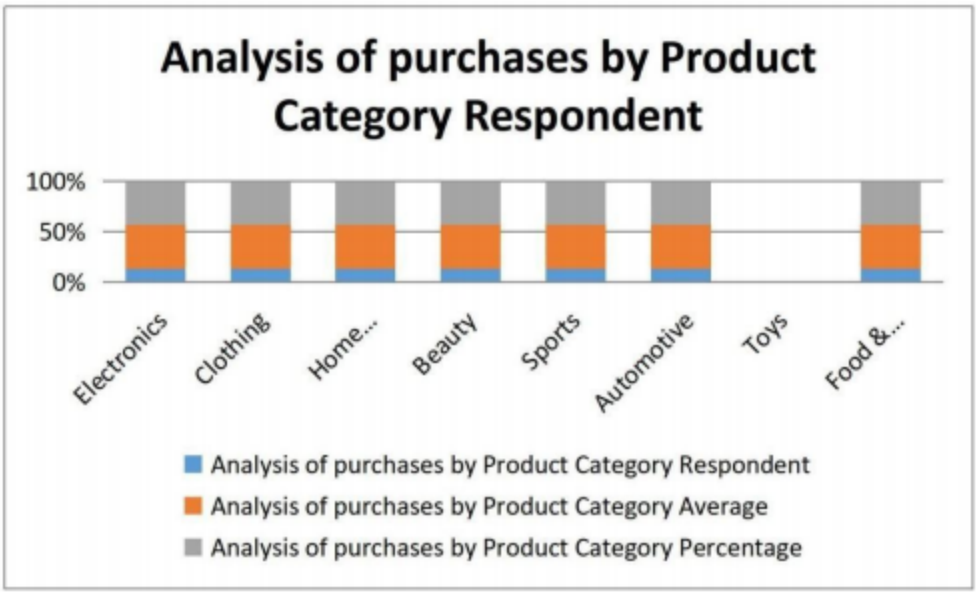
a)CompleteTable6

Table6: Analysis of purchases by Product Category

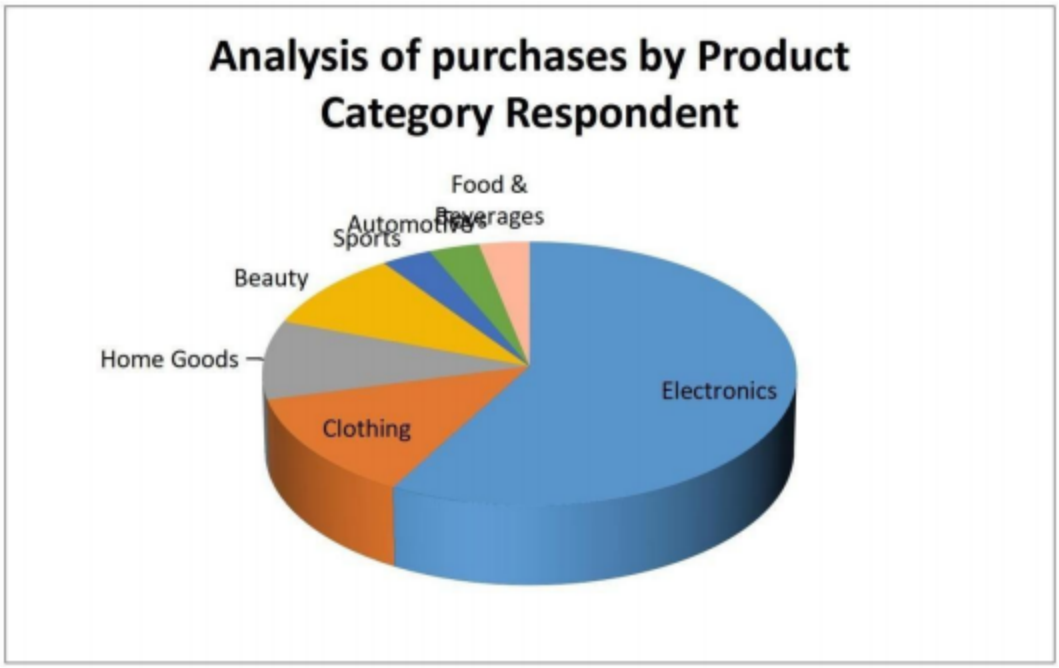
Analysis of purchases by Product Category			
	Respondent	Average	Percentage
Electronics	18	58.06451613	5806.5%
Clothing	4	12.90322581	1290.3%
HomeGoods	3	9.677419355	967.7%
Beauty	3	9.677419355	967.7%
Sports	1	3.225806452	322.6%
Automotive	1	3.225806452	322.6%
Toys	0	0	0.0%
Food &Beverages	1	3.225806452	322.6%
Total	31		

Use bar or pie charts to visualize the product categories

- **Bar Chart:** Show the number of entries per product category.



- **Pie Chart:** Illustrate the percentage distribution across categories.



b) Provide insights to**:**

• Identify product categories satisfaction ratings.

- Electronicswith58%
- Clothingwith4%
- Beauty andHomeGoodswith9%.And
- Sports,AutomotiveandFood&Beverageswith3%

• Give recommendations on which products should be marketed more, or discontinued.

SECTION8. ANALYSIS OF BY SALES CHANNEL

TASK: This section looks at sales channel to identify how most customers purchase the products available.

REQUIRED:

a) CompleteTables8aand8b

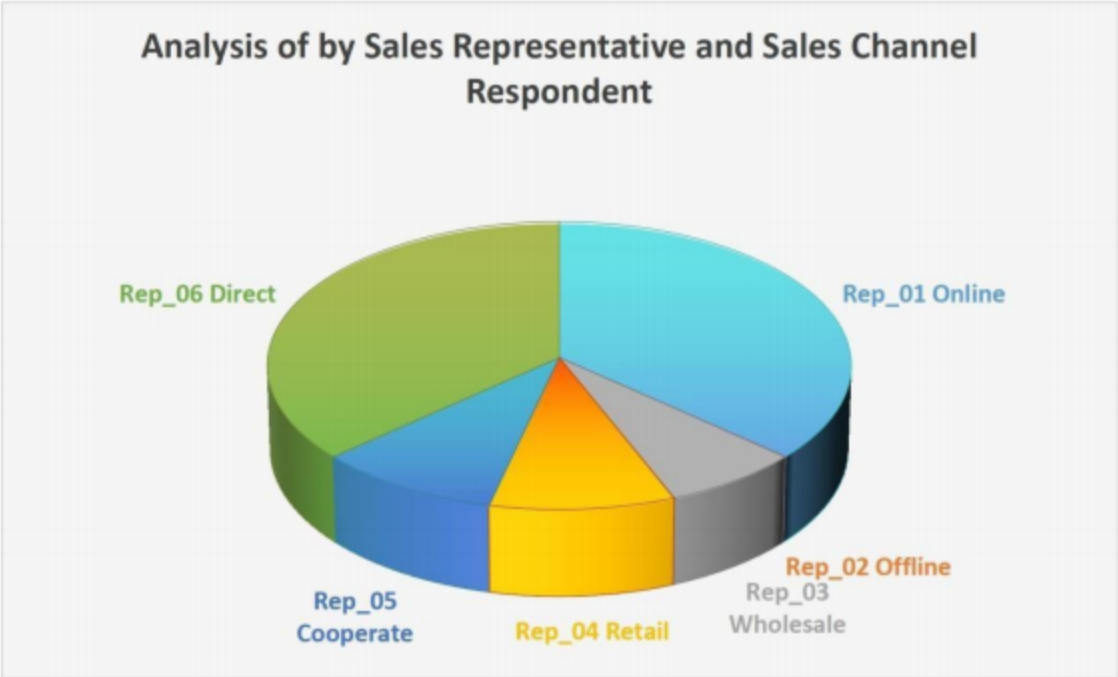
Table 8a: Analysis of by Sales Channel

Analysis of by Sales Representative and Sales Channel				
Sales Rep ID	Sales Channel	Respondent	Average	Percentage
Rep_01	Online	18	36.73469388	3673.5%
Rep_02	Offline	0	0	0.0%
Rep_03	Wholesale	8	16.32653061	1632.7%

Rep_04	Retail	2	4.081632653	408.2%
Rep_05	Cooperate	3	6.12244898	612.2%
Rep_06	Direct	18	36.73469388	3673.5%
Total		49		

Table 8b: Analysis of customer general feedback across the different channels, identify if the most common feedbacks for sales respire negative, positive or neutral

Bar Chart: Show the frequency of analysis entries by sales channel.



Deduce in sights to:

• Determine which sales channels are associated with higher or lower levels of analysis.

The sale representative with higher analysis is Online and Direct while Cooperate and Government represent lower analysis.

- Identifytrendsorpossibleissueswithspecifictodifferentsaleschannels.
- **Carry out recommendations on ways to improve certain channels.**

Below are the steps which the Business analysis and accountancy expert should take namely:

i. The Business analysis and accountancy expert should organize in- service training programmme for its staff in order to make them familiar with the accounting system or procedure of the board.

ii. The accounting system must be developed in a manner that will permit effective administrative control fund and operation, programmes management and internal audit appraisal.

SECTION 8: RECOMMENDATIONS

Based on the insights gathered from the analysis of sentiment distribution, sales performance by region, customer segmentation, product categories, and sales channels, several recommendations are presented to improve business operations, decision-making, and customer engagement.

These recommendations are practical, data-driven, and designed to guide businesses in making informed strategic choices.

1. Strengthen Online and Direct Sales Channels

The analysis shows that online and direct channels are the most frequently used by customers. Businesses should continue investing in these platforms by improving user experience, increasing online visibility, and offering secure and flexible payment options. Additionally, promoting direct engagement with customers through personalized messaging and loyalty programs will increase retention and trust

2. Expand Operations in High-Performing Regions

Africa emerged as the region with the highest number of purchases and positive feedback. This indicates significant market potential. Businesses should prioritize distribution, marketing, and service delivery in such regions to build on existing demand and customer loyalty.

3. Introduce Data-Driven Customer Segmentation Strategies

Different customer groups (online, wholesale, corporate, retail, government) have varying needs. Businesses should tailor their services and offers to suit each segment. For example, wholesalers may require bulk discounts, while government clients may prioritize formal documentation and long-term service reliability.

4. Re-evaluate Underperforming Product Categories

Product categories like Toys, Automotive, and Food & Beverages showed very low engagement. Companies should investigate the reasons — such as low demand, poor marketing, or quality issues — and decide whether to improve, repurpose, or discontinue such products to reduce losses.

5. Monitor and Act on Customer Sentiment Regularly

Sentiment analysis revealed that the majority of customers expressed positive feedback, while a small portion was neutral or negative. Businesses should continue monitoring customer feedback through surveys and reviews, addressing concerns quickly to maintain customer satisfaction and brand reputation.

6. Improve Sales Representative Performance through Training

Certain sales representatives or regions had limited impact. Investing in training for sales staff — especially on ethical practices, communication skills, and customer relationship management — can boost their effectiveness and professionalism.

7. Implement Regular Business Intelligence Reviews

Using tools like dashboards and data visualization should not be a one-time activity. Businesses should adopt a continuous BI process where key metrics are reviewed weekly or monthly. This ensures agility in responding to market trends and changes in customer behavior

Final Note:

These recommendations provide a roadmap for turning data into action. By following them, businesses can improve operational efficiency, maximize profits, and provide better customer experiences.

SECTION 9: CONCLUSION

10.0 Summary and Final Thoughts

This capstone project has explored the application of Business Intelligence (BI) in analyzing business data for effective decision-making. By transforming raw data into meaningful insights through visualizations and interpretation, the project demonstrates how BI can be used to improve business performance, understand customer behavior, and optimize sales strategies.

Throughout the study, various aspects of the business were examined — including customer sentiment, regional sales distribution, customer segmentation, product performance, and sales channels. The analysis revealed key findings such as the dominance of online and direct sales channels, the strong performance of the African region in terms of customer engagement and purchases, and the popularity of electronics as a leading product category.

The use of pie and bar charts, percentage calculations, and comparative analysis helped to simplify complex data and present it in a format that supports strategic decision-making. These visual tools not only make the information more accessible to stakeholders but also improve the speed and accuracy of business responses to market conditions.

Importantly, the study highlights areas of strength as well as opportunities for improvement. Underperforming sales channels, neglected product categories, and uneven customer engagement patterns were all identified through structured analysis. These findings were used to develop clear and practical recommendations that businesses can adopt to enhance efficiency, customer satisfaction, and profitability.

In conclusion, this project demonstrates the value of Business Intelligence in the modern business environment. It shows that even with simple tools and limited resources, organizations can harness the power of data to make smarter, faster, and more confident decisions. Business Intelligence is not just a technical tool — it is a strategic asset that empowers businesses to grow, compete, and adapt in a data-driven world.

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