

Acknowledgement

The writing of this training report has been assisted by the generous help of many people. I feel that I was very fortunate to receive assistance from them. I wish to express my sincere appreciation to them.

First and foremost, I am indebted to my principal supervisor, **Mr. Mukesh Kumar (Instructor & Trainer) of Excellence Technology, Mohali** who has been very supportive at every stage of my preparations. I wish to express my utmost gratitude to him/her for his/her invaluable advice and patience in reading, correcting and commenting on the drafts of the report and, more importantly, for his/her generosity which I have received throughout my training program.

I would like to acknowledge and extended my heartfelt gratitude **to Mrs. Upasana Sood**, Head of Department who provided me the golden opportunity to undergo and complete this training program.

I wish to express my thanks to **Miss. Mehak Kaur** who also helped me in conducting this study and encouraged me throughout this journey.

Finally, I am particularly indebted to my dearest parents/guardians as without their generous assistance and love; this dissertation could never have been completed.

Akshay kumar

(8522181)

CONTENTS

Declaration Certificate	2
Acknowledgement	3
Table of Contents	4-5
Introduction <ul style="list-style-type: none"> ➤ Objective ➤ Methodology ➤ Data Visualization in PowerBi 	6-9
Introduction to Data Analysis <ul style="list-style-type: none"> ➤ Objective ➤ Tools Overview 	10-11
Introduction to Microsoft Excel <ul style="list-style-type: none"> ➤ Objective ➤ Key Features of Microsoft Excel ➤ Why Microsoft Excel? ➤ Popular use cases of Microsoft Excel 	12-16
Introduction to powerBi <ul style="list-style-type: none"> ➤ What is PowerBi? ➤ Key Feature of PowerBi ➤ Why PowerBi ➤ Different types of visuals in PowerBi 	17-24
Data Collection <ul style="list-style-type: none"> ➤ Data Sources ➤ Data Collection Methods ➤ Data Processing 	25-29
Introduction to Blinklt PowerBi Project <ul style="list-style-type: none"> ➤ Data Overview on Blinklt PowerBi Project ➤ Objectives ➤ Methodology ➤ Analysis And Findings ➤ Visualization ➤ Recommendations ➤ Problem Statement 	29-40

<ul style="list-style-type: none"> ➤ Key Performance Indicators (KPIs) ➤ Actions ➤ Insights Derived from Each Chart 	
Introduction to DAX And M Language <ul style="list-style-type: none"> ➤ Report on DAX Formulas and M Language Applications 	41-44
Screenshot	45-48
Inference and Tools and Technologies Used	49
Benefits and Conclusion	50

CHAPTER 1

Introduction

The **BlinkIt Sales Dashboard in Power BI** is a comprehensive analytics tool designed to evaluate and visualize sales data, empowering data-driven decision-making for businesses. This project provides actionable insights into sales performance, profitability, and operational efficiency, allowing stakeholders to identify trends, optimize resources, and enhance overall business performance.

Objectives:

1. **Analyze Sales Performance:** Identify key trends in revenue generation across different periods, regions, and product categories.
2. **Understand Profitability:** Evaluate profit margins and highlight high-performing and underperforming products or regions.
3. **Operational Insights:** Analyze shipping costs, delivery methods, and their impact on profitability.
4. **Customer Segmentation:** Provide a deeper understanding of customer behavior across different market segments.
5. **Interactive Reporting:** Develop an intuitive and dynamic dashboard for users to filter and drill down into specific data points.

Methodology:

This project will employ a multifaceted approach leveraging various data analytic techniques, including:

- **Descriptive Statistics:** Utilizing summary statistics and exploratory data analysis to gain initial insights into sales data.
- **Data Visualization:** Creating visually engaging charts, graphs, and dashboards to illustrate key findings and trends.
- **Customer Segmentation:** Employing clustering algorithms to segment customers based on purchasing behavior and demographics.
- **Predictive Modeling:** Developing predictive models to forecast future sales trends and anticipate customer demand.

Data Visualization in Power BI:

The core of the methodology was the creation of interactive dashboards using Power BI. The following steps were followed:

- **Visual Design:** The dashboard was designed with a focus on clarity and usability. Key visual elements like charts, tables, and slicers were strategically placed to allow users to easily explore sales data.
- **Selection of Visuals:** Various visualizations were chosen based on the nature of the data:
 - **Bar/Column Charts:** Used to show sales and profit by region, market, and state.
 - **Pie/Donut Charts:** Displayed the breakdown of

sales by product category and other segmentations.

- **Line/Area Charts:** Used to show sales trends over time.
- **Top 5 Performance:** A KPI visual to highlight the top 5 countries by sales and profit.
- **Interactivity:** Slicers were added to enable users to filter the data based on parameters such as Region, Category, and Time Period. Tooltips were incorporated for additional information when hovering over data points.
- **DAX Measures:** Various DAX measures were created to calculate key metrics like "Total Sales," "Profit Margin," and "Sales Growth." These dynamic measures helped present real-time, accurate data on the dashboard.

CHAPTER 2

Introduction to Data Analysis

Introduction to Data Analysis

Data analysis has become an integral part of decision-making in modern organizations. This project explores the fundamentals of data analysis using two widely used tools: Microsoft Excel and Power BI. It demonstrates their capabilities for data manipulation, visualization, and deriving insights from datasets.

Objective

1. **Understand Data Analysis:** Introduce the concepts and importance of data analysis.
2. **Learn Key Features of Excel and Power BI:** Explore their features for data cleaning, transformation, and visualization.
3. **Apply Techniques to a Dataset:** Demonstrate practical applications of data analysis using these tools.

Tools Overview

1. Microsoft Excel:-

- Widely used spreadsheet application for data manipulation and analysis.
- Key Features:
 - Data cleaning using filters, formulas, and conditional formatting.
 - Analysis tools like PivotTables, Data Analysis ToolPak, and formulas (e.g., VLOOKUP, IF, SUMIFS).
 - Basic visualizations (charts, graphs)

2. Microsoft PowerBi:-

- A business intelligence tool for creating interactive dashboards and reports.
- Key Features:
 - Data modeling with Power Query.
 - Rich library of visuals and the ability to customize them.
 - Integration with multiple data sources and real-time updates.

CHAPTER 3

Introduction to Microsoft Excel

Introduction to Microsoft Excel

Microsoft Excel is one of the most widely used tools for data analysis, offering robust features for organizing, analyzing, and visualizing data. This project report explores the functionalities of Excel and demonstrates its application in real-world data analysis tasks.

Objective

- 1) Understand the Basics:** Learn the fundamental features of Microsoft Excel.
- 2) Explore Analytical Tools:** Discover Excel's data analysis capabilities such as formulas, functions, and PivotTables.
- 3) Demonstrate Use Cases:** Apply Excel techniques to analyze and visualize a sample dataset.

Key Features of Microsoft Excel

- 1) Data Organization:**
 - Rows and columns for structured data storage.
 - Sorting and filtering for efficient data retrieval.
- 2) Formulas and Functions:**
 - Commonly used formulas: SUM, AVERAGE, IF, COUNT, and VLOOKUP.
 - Logical, text, and statistical functions for advanced data manipulation.
- 3) Data Analysis Tools:**
 - PivotTables: Summarize large datasets and create multi-dimensional views.
 - Conditional Formatting: Highlight trends and anomalies in data.
 - Data Analysis ToolPak: Perform statistical analysis like regression and descriptive statistics.
- 4) Visualization:**
 - Charts (bar, line, pie, scatter, etc.) for representing data visually.

- Sparklines for inline trends.

5) Automation:

- Macros for automating repetitive tasks.
- Data validation for ensuring data integrity.

6) Data Import and Export:

- Excel can Import data from various sources, including databases, text files, and web pages, and export data to different formats (e.g., CSV, PDF).

7) Macros and Automation:

- Users can create macros to automate repetitive tasks, enhancing productivity and efficiency.

Why Microsoft Excel?

1. Data Organization and Management:

- Excel helps users store and organize large amounts of data systematically. It can handle anything from simple lists to complex datasets.

2. Data Analysis:

- Excel offers tools such as PivotTables, formulas, and functions (like SUM, AVERAGE, VLOOKUP) to analyze and interpret data effectively.

3. Calculations:

- With its built-in mathematical, statistical, and logical functions, Excel makes it easy to perform calculations ranging from basic arithmetic to complex financial models.

4. Visualization:

- Excel enables users to create visual representations of data through charts, graphs, and dashboards, making it easier to interpret and communicate findings.

5. Automation:

- Using macros and Visual Basic for Applications (VBA), users can automate repetitive tasks, improving efficiency.

6. Versatility:

- Excel can be used for various applications, including financial modeling, budgeting, project management, data entry, and more.

7. Collaboration:

- With cloud integration through Microsoft 365, Excel allows multiple users to collaborate on spreadsheets in real-time, enhancing productivity

8. Integration:

- Excel integrates seamlessly with other Microsoft Office applications and third-party tools, making it a versatile component of a broader workflow.

9. Accessibility and Ease of Use:

- Its intuitive interface and widespread use make Excel accessible to both beginners and advanced users.

Popular Use Cases of Microsoft Excel

1. Business:

- Financial reporting, sales tracking, and inventory management.

2. Education:

- Grading, attendance records, and research data analysis.

3. Personal Use:

- Budget planning, event scheduling, and household management.

4. Data Science:

- Preliminary data exploration and small-scale data analysis.

Microsoft Excel interface showing the Home tab ribbon and a blank worksheet.

File **Home** **Insert** **Page Layout** **Formulas** **Data** **Review** **View** **Help**

Clipboard Paste (X, I, U, B, I, U, B, I, U) AutoSave Off Book1 - Excel

Font Aptos Narrow 11 A A Font Color Background Color

Paragraph Wrap Text Merge & Center

Number General 0.00 1.00 %

Styles Conditional Formatting Table Styles

Cells Insert Delete Format

Editing AutoSum Fill Clear Sort & Find & Filter Select

Comments Add-ins Analyze Data Share

Worksheet Grid: Columns A-W, Rows 1-29. Cell A1 is selected.

Tooltip: Increase Indent. Move your content farther away from the cell border.

CHAPTER 4

Introduction to PowerBi

Introduction to PowerBi

In today's data-driven world, businesses must make informed decisions quickly and accurately. Power BI, a leading business analytics tool by Microsoft, is designed to meet this demand by transforming raw data into insightful and interactive visualisations.

This blog explores the capabilities of Power BI, its various applications, and why it stands out in the realm of data visualisation. The primary objective was to answer critical business questions, identify key insights, and present findings through interactive visualisations. The charts used in this project serve a specific purpose in analysing and visualising different aspects of Blinkit's operations.

What is Power BI?

Power BI is a business analytics tool suite that delivers insights throughout your organisation. It enables users to connect to hundreds of data sources, simplify data prep, and drive ad hoc analysis. Reports and dashboards can be shared easily across teams and organisations, helping everyone make informed decisions based on the same data.

Key Features of Power BI:-

- **Data Connectivity:** Connects to various data sources, including Excel, SQL Server, Azure, and online services like Google Analytics and Salesforce.
- **Data Transformation:** Power Query allows for data cleaning, transformation, and merging from various sources.
- **Interactive Visualisations:** A wide array of customisable visualisations to represent data most insightfully.
- **Real-Time Dashboards:** Dashboards can be updated in real-time, ensuring up-to-date information is always available.
- **Collaboration:** Share reports and dashboards with colleagues and stakeholders easily, promoting data-driven decision-making.

- **Security:** Robust security features, including data encryption, row-level security, and integration with Azure Active Directory.

Why PowerBi?

Power BI is a leading business intelligence and data visualization tool that stands out for its powerful features, ease of use, and ability to transform complex datasets into actionable insights. Here are the key reasons why Power BI is an excellent choice for business intelligence projects:

1. User-friendly Interface:

- PowerBI offers an intuitive drag-and-drop interface, making it accessible for both technical and non-technical users.
- Its easy-to-navigate workspace allow users to build compelling reports and dashboard without extensive coding knowledge.

2. Wide data connectivity:

- Power BI can connect to a vast array of data sources, including:
 - Databases: SQL Server, MySQL, PostgreSQL, Oracle.
 - Cloud Platforms: Azure, AWS, Google BigQuery.
 - Files: Excel, CSV, JSON.
 - Online Services: Salesforce, Google Analytics, SharePoint, and APIs.
- This versatility makes it ideal for integrating data from multiple systems into a single platform.

3. Advanced data Transformation:

- The Power Query Editor in Power BI enables users to clean, filter, merge, and transform data with ease.
- It allows for advanced transformations like unpivoting data, creating calculated columns, and handling missing or inconsistent data.

4. Powerful DAX (Data Analysis Expression):

- Power BI's DAX formula language allows for the creation of complex calculations and measures.
- Examples include:
 - i. Time-based calculations (e.g., Year-to-Date, Month-over-Month Growth).
 - ii. Dynamic KPIs like Profit Margins, Cumulative Totals, and Forecasts.
- DAX's flexibility supports advanced business logic for customized insights.

5. Real – time Analytics:

- Power BI supports real-time data updates, enabling businesses to monitor operations and make immediate decisions.
- It integrates with streaming data sources, IoT devices, and APIs for live insights.

6. Cost-Effectiveness:

- Power BI Desktop is free to use, allowing individuals and small businesses to start analyzing data at no cost.
- Affordable pricing for Power BI Pro and Power BI

Premium provides additional features like cloud sharing, collaboration, and larger data capacities.

Different types of visuals in Power BI

Power BI offers a variety of visualizations to represent data effectively, each suited for specific types of analysis. Here's a detailed list of the different types of visuals available in Power BI:

1. Basic Chart Visualization:

These visuals are used for simple comparisons, trends, and distributions.

- **Bar Chart:** Displays data using horizontal bars. Useful for comparing categories.
 - Types: Clustered Bar, Stacked Bar.
- **Column Chart:** Similar to bar charts but with vertical bars.
 - Types: Clustered Column, Stacked Column, 100% Stacked Column.
- **Line Chart:** Shows trends over time using connected data points.
- **Area Chart:** Similar to a line chart but with the area below the line filled with color.
 - Types: Stacked Area, 100% Stacked Area.
- **Pie Chart:** Displays proportions or percentages as slices of a circle.
- **Donut Chart:** A variation of the pie chart with a hole in the center.

2. Combination Charts:

- **Line and Column Chart:** Combines line and column charts for showing trends and comparisons on the same visual.

- **Line and Stacked Column Chart:** Combines line and stacked column charts.
- **Line and Clustered Column Chart:** Combines line and clustered column charts.

3. Data distribution Visuals:

- **Histogram:** Shows data distribution by grouping data into bins.
- **Scatter Chart:** Plots data points based on two numeric values; useful for showing relationships.
- **Bubble Chart:** An extension of a scatter chart with a third data point represented by bubble size.

4. Maps:

- **Basic Map:** Plots locations using latitude and longitude or addresses.
- **Filled Map (Choropleth Map):** Highlights regions (e.g., countries, states) with colors based on values.
- **ArcGIS Map:** Advanced mapping with spatial analysis from ArcGIS integration.

5. Tables and Matrices:

- **Table:** Displays data in a tabular format with rows and columns.
- **Matrix:** Similar to a table but allows drill-down and hierarchies.

6. Cards:

- **Single Number Card:** Displays a single value, such as a KPI or summary metric.

- **Multi-Row Card:** Displays multiple values in a list format.

7. KPIs (Key Performance Indicators)

- Displays progress toward a goal with indicators like colors and arrows.



CHAPTER 5

Data Collection

Effective data collection lays the foundation for robust analysis and actionable insights. In this section, we provide a detailed overview of the data sources, collection methods, and preprocessing steps undertaken to ensure the reliability and integrity of the data.

Data Sources

The sales data used in this analysis was sourced from multiple sources to capture a comprehensive view of sales activities and customer interactions. The primary data sources include:

- **Point of Sale (POS) Systems:** Transactional data collected from POS systems provide granular insights into individual sales transactions, including item details, transaction timestamps, and payment methods.
- **E-commerce Platforms:** Data from online sales channels offer valuable insights into digital transactions, customer demographics, and purchasing behaviors, complementing the information gathered from physical store transactions.
 - **Amazon Seller Central:** Provides sales reports, order details, customer feedback, and product performance.
 - **Amazon Vendor Central:** Supplies data on wholesale orders, purchase orders, and product returns.
 - **Other E-commerce Platforms:** Data from platforms like Shopify, eBay, or Flipkart can supplement Amazon data.
- **Customer Relationship Management (CRM) Systems:** Customer data stored in CRM systems,

such as customer profiles, contact information, and purchase history, enriches the analysis by enabling customer segmentation and personalized marketing strategies.

- **Inventory Management Systems:** Inventory data, including stock levels, product attributes, and replenishment schedules, are integrated to analyze inventory turnover rates, identify product trends, and optimize stock levels.

Data Collection Methods

Data collection involved the extraction, transformation, and loading (ETL) of raw data from disparate sources into a centralized data repository for analysis. The following methods were employed to collect and consolidate the store sales data:

- **Automated Data Retrieval:** Automated scripts and APIs were utilized to extract data from POS systems, e-commerce platforms, CRM systems, and other relevant sources at regular intervals, ensuring real-time access to up-to-date sales information.
- **Manual Data Entry:** In cases where automated data retrieval was not feasible, manual data entry procedures were employed to input sales data into the centralized repository. Strict data validation and verification protocols were implemented to minimize errors and discrepancies.
- **Data Integration:** Data integration techniques, such as data blending and data warehousing, were employed to harmonize heterogeneous data from different sources, ensuring consistency and compatibility for analysis.

Data Processing

Prior to analysis, the collected data underwent extensive

preprocessing to address missing values, outliers, and inconsistencies. The following preprocessing steps were applied to ensure data quality and reliability:

- **Data Cleaning:** Irregularities and errors in the data, such as missing values, duplicate entries, and incorrect formatting, were identified and rectified using data cleaning techniques such as imputation, deduplication, and standardization.
- **Feature Engineering:** New features were derived from existing data to enhance the analysis, such as calculating aggregate metrics (e.g., total sales revenue, average transaction value) and creating categorical variables for segmentation purposes (e.g., customer segments based on purchase frequency).
- **Normalization and Scaling:** Numerical variables were normalized or scaled to a standard range to mitigate the impact of differing scales and magnitudes on the analysis results, ensuring fair comparisons and accurate interpretation of findings.

BlinkIT Grocery Data - Saved to this PC													
File Home Insert Page Layout Formulas Data Review View Help Table Design													
Clipboard Font Alignment Number Styles Cells Editing Add-Ins													
H5 Supermarket Type1													
Item Fat Content	Item Identifier	Item Type	Outlet Establishment Year	Outlet Identifier	Outlet Location Type	Outlet Size	Outlet Type	Item Visibility	Item Weight	Sales	Rating		
1 Regular	FDX32	Fruits and Vegetables	2012 OUT049	Tier 1	Tier 1	Medium	Supermarket Type1	0.1000135	15.1	145.4786	5		
3 Low Fat	NCB42	Health and Hygiene	2022 OUT048	Tier 3	Tier 3	Medium	Supermarket Type2	0.008596051	11.8	115.3492	5		
4 Regular	FDR28	Frozen Foods	2016 OUT046	Tier 1	Tier 1	Small	Supermarket Type1	0.025896485	13.85	165.021	5		
5 Regular	FDL50	Canned	2014 OUT043	Tier 3	Tier 3	High	Supermarket Type1	0.042727867	12.15	126.5046	5		
6 Low Fat	DR125	Soft Drinks	2015 OUT045	Tier 2	Tier 2	Small	Supermarket Type1	0.033970195	19.6	55.1614	5		
7 Low fat	FD552	Frozen Foods	2020 OUT047	Tier 2	Tier 2	Small	Supermarket Type1	0.005505481	8.89	102.4016	5		
8 Low Fat	NCU05	Health and Hygiene	2011 OUT040	Tier 3	Tier 3	Small	Grocery Store	0.098312421	11.8	81.4618	5		
9 Low Fat	NCD30	Household	2015 OUT045	Tier 2	Tier 2	Small	Supermarket Type1	0.026903714	19.7	96.0726	5		
10 Low Fat	FDW20	Fruits and Vegetables	2014 OUT043	Tier 3	Tier 3	High	Supermarket Type1	0.024129332	20.75	124.173	5		
11 Low Fat	FDX25	Canned	2018 OUT027	Tier 3	Tier 3	Medium	Supermarket Type3	0.101561568		181.9292	5		
12 LF	FDX21	Snack Foods	2018 OUT027	Tier 3	Tier 3	Medium	Supermarket Type3	0.084554569		109.8912	5		
13 Low Fat	NCU41	Health and Hygiene	2017 OUT035	Tier 2	Tier 2	Small	Supermarket Type1	0.052044976	18.85	192.1846	5		
14 Low Fat	FDL20	Fruits and Vegetables	2022 OUT048	Tier 3	Tier 3	Medium	Supermarket Type2	0.128937661	17.1	112.3886	5		
15 Low Fat	NCR54	Household	2014 OUT013	Tier 3	Tier 3	High	Supermarket Type1	0.090486828	16.35	195.211	5		
16 Low Fat	FDH19	Meat	2018 OUT027	Tier 3	Tier 3	Medium	Supermarket Type3	0.03292824		173.1738	5		
17 Regular	FD857	Fruits and Vegetables	2017 OUT035	Tier 2	Tier 2	Small	Supermarket Type1	0.018801549	20.25	222.1772	5		
18 Low Fat	FDD33	Breads	2022 OUT048	Tier 3	Tier 3	Medium	Supermarket Type2	0.147023834	17.85	93.7436	5		
19 Low Fat	NCB07	Household	2012 OUT049	Tier 1	Tier 1	Medium	Supermarket Type1	0.077628053	19.2	197.611	5		
20 Low Fat	FDJ56	Fruits and Vegetables	2018 OUT027	Tier 3	Tier 3	Medium	Supermarket Type3	0.182514881		98.77	5		
21 Low Fat	DRN47	Hard Drinks	2022 OUT048	Tier 3	Tier 3	Medium	Supermarket Type2	0.016895293	12.1	178.566	5		
22 Regular	FD207	Fruits and Vegetables	2018 OUT027	Tier 3	Tier 3	Medium	Supermarket Type3	0		60.2194	5		
23 Low Fat	NCK31	Others	2018 OUT027	Tier 3	Tier 3	Medium	Supermarket Type3	0.026916794		50.9666	5		
24 Low Fat	FDJ41	Frozen Foods	2022 OUT048	Tier 3	Tier 3	Medium	Supermarket Type2	0.022976497	6.85	261.6594	5		
25 Low Fat	DR151	Dairy	2022 OUT048	Tier 3	Tier 3	Medium	Supermarket Type2	0.042413704	17.25	173.1764	5		
26 Regular	FDC40	Dairy	2020 OUT047	Tier 2	Tier 2	Medium	Supermarket Type1	0.065431917	16	76.1986	5		
27 Low Fat	FDB53	Frozen Foods	2020 OUT047	Tier 2	Tier 2	Medium	Supermarket Type1	0.140241213	13.35	150.2392	5		
28 Low Fat	FDA16	Frozen Foods	2017 OUT035	Tier 2	Tier 2	Small	Supermarket Type1	0.033935576	6.695	221.9456	5		
29 Regular	FDO19	Fruits and Vegetables	2018 OUT027	Tier 3	Tier 3	Medium	Supermarket Type3	0.016516275		47.4034	5		
30 Low Fat	FDO04	Frozen Foods	2016 OUT046	Tier 1	Tier 1	Small	Supermarket Type1	0.026537206	16.6	57.2614	5		
31 Regular	FDI 25	Breakfast	2017 OUT044	Tier 1	Tier 1	Medium	Supermarket Type1	0.131178467	6.09	93.1804	5		

CHAPTER 6

Introduction to Blinkilt PowerBi Project

Data Overview on BlinkIt PowerBI Project:-

The data contains the following columns:

- **Item Fat Content:** Indicates whether the product is Low Fat or Regular.
- **Item Identifier:** A unique identifier for each product
- **Item Type:** The category of the product (e.g., Fruits and Vegetables, Frozen Foods).
- **Outlet Establishment Year:** The year the outlet was established.
- **Outlet Identifier:** A unique identifier for each outlet.
- **Outlet Location Type:** Tier level of the outlet's location (e.g., Tier 1, Tier 2).
- **Outlet Size:** Outlet size (Small, Medium, High).
- **Outlet Type:** Type of outlet (e.g., Supermarket Type1, Supermarket Type2).
- **Item Visibility:** The percentage visibility of the item in the store.
- **Item Weight:** Weight of the item.
- **Sales:** Sales revenue for the item.
- **Rating:** Customer rating for the item.

Objectives:-

- Understand sales performance by item and outlet characteristics.
- Analyze outlet performance across different regions and types.
- Identify key drivers of sales, such as item visibility, weight, and ratings.
- Spot trends in customer preferences and temporal performance.

Methodology:-

The analysis was conducted using Power BI to design interactive dashboards:

1. **Data Preparation:** The dataset was cleaned and processed for accuracy and consistency.
2. **Data Modeling:** Relationships were established between key fields for dynamic filtering.
3. **Visualization:** Dashboards and charts were created to analyze sales, performance, and trends.

Analysis and Findings:-

➤ Sales Performance:-

- **Top-Selling Items:** Categories such as Fruits & Vegetables and Soft Drinks showed the highest sales volume.
- **Impact of Fat Content:** Low-fat items performed slightly better in sales compared to regular items.

➤ Outlet Analysis:-

- **Outlet Types:** Supermarket Type 1 generated the highest revenue across all outlet types.
- **Location Trends:** Tier 1 locations contributed the majority of sales due to higher customer traffic.
- **Size Influence:** Medium-sized outlets showed the best performance, balancing inventory and customer flow.

➤ Temporal Trends:-

- Sales steadily increased for outlets established after 2015, reflecting expansion and market penetration.

➤ Drivers of Sales:-

- **Visibility:** Items with higher visibility (≥ 0.04) demonstrated increased sales.
- **Weight:** Products weighing between 10 and 20 units contributed the most to revenue

Visualizations:-

Key visualizations included:

- **Sales Distribution by Item Type:** Bar and pie charts showing the contribution of each category.
- **Outlet Performance Dashboard:** Heatmap displaying sales by size, location, and type.
- **Temporal Trend Line:** Highlighting year-over-year growth in sales.
- **Correlation Analysis:** Scatter plots depicting relationships between sales, visibility, and weight.

Recommendations:-

- **Inventory Optimization:**
 - Focus on top-performing categories like Fruits & Vegetables and Soft Drinks.
 - Increase visibility for low-performing items to boost sales.\
- **Outlet Expansion:**
 - Prioritize new outlets in Tier 1 and Tier 2 locations.
 - Emulate the medium-sized outlet model for optimal results.
- **Promotional Strategies:**
 - Target high-rated items with seasonal promotions.
 - Introduce offers on regular-fat items to balance demand.

Problem Statement:-

The Blinkit Data Analysis project aimed to address several critical business questions:

- What are the sales trends over time?
- Which products and categories are top-sellers?
- What are the customer purchase patterns?

blinkit Analysis

BUSINESS REQUIREMENT

Chart's Requirements

1. Total Sales by Fat Content:

Objective: Analyze the impact of fat content on total sales.

Additional KPI Metrics: Assess how other KPIs (Average Sales, Number of Items, Average Rating) vary with fat content.

Chart Type: Donut Chart.

2. Total Sales by Item Type:

Objective: Identify the performance of different item types in terms of total sales.

Additional KPI Metrics: Assess how other KPIs (Average Sales, Number of Items, Average Rating) vary with fat content.

Chart Type: Bar Chart.

3. Fat Content by Outlet for Total Sales:

Objective: Compare total sales across different outlets segmented by fat content.

Additional KPI Metrics: Assess how other KPIs (Average Sales, Number of Items, Average Rating) vary with fat content.

Chart Type: Stacked Column Chart.

4. Total Sales by Outlet Establishment:

Objective: Evaluate how the age or type of outlet establishment influences total sales.

Chart Type: Line Chart.

blinkit Analysis

BUSINESS REQUIREMENT

Chart's Requirements

5. Sales by Outlet Size:

Objective: Analyze the correlation between outlet size and total sales.

Chart Type: Donut/ Pie Chart.

6. Sales by Outlet Location:

Objective: Assess the geographic distribution of sales across different locations.

Chart Type: Funnel Map.

7. All Metrics by Outlet Type:

Objective: Provide a comprehensive view of all key metrics (Total Sales, Average Sales, Number of Items, Average Rating) broken down by different outlet types.

Chart Type: Matrix Card.

Key Performance Indicators (KPIs):

blinkit Analysis

BUSINESS REQUIREMENT

To conduct a comprehensive analysis of Blinkit's sales performance, customer satisfaction, and inventory distribution to identify key insights and opportunities for optimization using various KPIs and visualizations in Power BI.

KPI's Requirements

1. **Total Sales:** The overall revenue generated from all items sold.
2. **Average Sales:** The average revenue per sale.
3. **Number of Items:** The total count of different items sold.
4. **Average Rating:** The average customer rating for items sold.

1. Total Sales KPIs:-

- **Total Revenue:-**

- \$32,000 overall sales (combined across all channels and products).
- Distribution:-
 - Online: \$15,000 (46.9% of total sales).
 - Social Media: \$9,262 (28.9% of total sales).
 - Stores: \$6,746 (21.1% of total sales).
 - Outlets: \$1,338 (4.2% of total sales).

- **Trend:-**

- Online dominates revenue contribution, while Outlet sales are negligible, suggesting areas for growth or reallocation of resources.

2. Return on Investment (ROI) KPIs:-

- **Overall ROI:** 7%.

- **Channel-Specific ROI:**

- Online: 12% (highest-performing channel).

- Social Media: 0% (indicates no returns on investments made; may require re-evaluation of strategy).
- Stores: 5% (reliable but less efficient than Online).
- Outlets: 18% (high ROI but limited sales, suggesting efficiency in spending).
- **Recommendation:** Invest more in Online, optimize Social Media, and expand Outlet strategies to maximize efficiency.

3. Product Performance KPIs:-

- **Top Products by Sales:-**
 - Maximus UM-70: \$2,359.
 - Maximus UM-11: \$2,118.
 - Maximus UM-54: \$1,917.
- **Top Products by ROI:-**
 - Pomum UM-05: 700%.
 - Victoria UM-01: 600%.
 - Aliqui UM-04: 300%.
- **Insights:-**
 - Focus marketing and production efforts on high-performing products for sustained growth.
 - Products with high sales but low ROI (e.g., Maximus UM-12) may require pricing or cost optimization.

4. Regional KPIs:-

- **Top-Performing States (by sales):-**
 - California, New York, and Pennsylvania contribute the highest to revenue across all channels.
- **Low-Performing States:-**
 - States like Michigan, Louisiana, and Washington show negligible sales, signaling potential untapped markets or ineffective campaigns in these regions.
- **ROI by State:-**
 - States in the South and West show higher ROI for Outlets, suggesting localized demand for this channel.

5. Temporal KPIs:-

- **Monthly Sales Trends:-**
 - Peak months: September to November for most channels (seasonal shopping).

- Low months: January and February, suggesting potential for promotional campaigns to drive post-holiday sales.

- **Sales Growth Rate:-**

- Online shows consistent growth over time, while Social Media and Outlets are more volatile.

6. Channel-Specific KPIs:-

- **Sales Per Channel:-**

- Online: 46.9% of total sales (leading channel).
- Social Media: 28.9% of total sales.
- Stores: 21.1% of total sales.
- Outlets: 4.2% of total sales (least utilized but high ROI).

- **Channel Dependence:-**

- Heavily reliant on Online sales. Diversification efforts needed to strengthen other channels like Stores and Social Media.

Actions:-

I. Increase Online Investments:-

- Allocate more budget to Online as it offers the highest revenue and ROI.

II. Reevaluate Social Media:-

- Assess campaign effectiveness and refine strategy to improve ROI.

III. Explore Regional Opportunities:-

- Focus marketing efforts in underperforming but high-potential states like Louisiana and Washington.

IV. Seasonal Campaigns:-

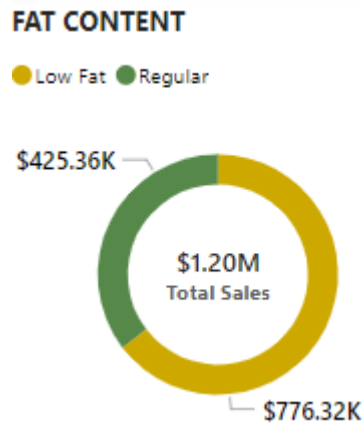
- Launch targeted campaigns in off-peak months (January March) to stabilize revenue.

V. Product Promotions:-

- Highlight high-ROI products (e.g., Pomum UM-05) in advertising to attract more sales while maintaining efficiency.

Insights Derived from Each Chart:-

1. **Donut Chart:** Revealed top revenue-generating product categories (e.g., fresh produce and dairy). This insight helped in strategic planning for inventory management and promotional activities.

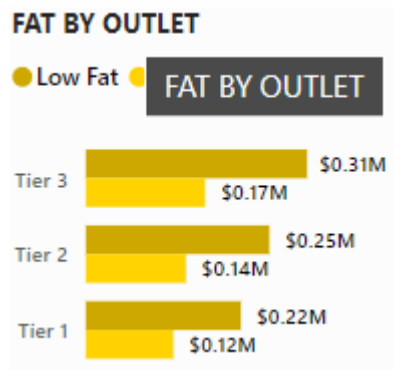


2. **Matrix Chart:** This chart showed that sales were higher in urban areas than in rural areas, and certain months, like December, had peak sales due to holiday shopping. Showed sales trends by year and region, highlighting urban areas with higher sales.

OUTLET TYPE

Outlet Type	Total Sales	No of items	Avg Sales	Avg Rating	Item Visibility
Supermarket Type2	\$131.48K	928	\$142	4	0.06
Grocery Store	\$151.94K	1083	\$140	4	0.10
Supermarket Type1	\$787.55K	5577	\$141	4	0.06
Supermarket Type3	\$130.71K	935	\$140	4	0.06

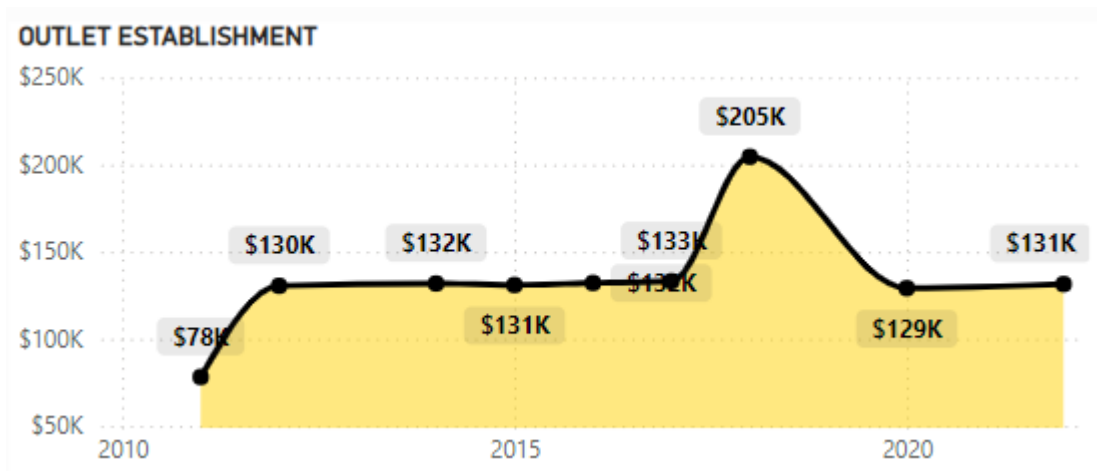
3. **Clustered Bar Chart:** Identified regions with higher sales and customer complaints, suggesting a need for improving service quality. It also highlighted underperforming regions that required targeted marketing efforts.



4. **Stacked Bar Chart:** Demonstrated inventory turnover rates and product categories, prompting a review of stocking policies.



5. **Line Chart:** Tracked consistent growth in sales over four quarters, with a significant drop during a specific period (attributed to a supply chain disruption). This led to measures to strengthen supply chain resilience.



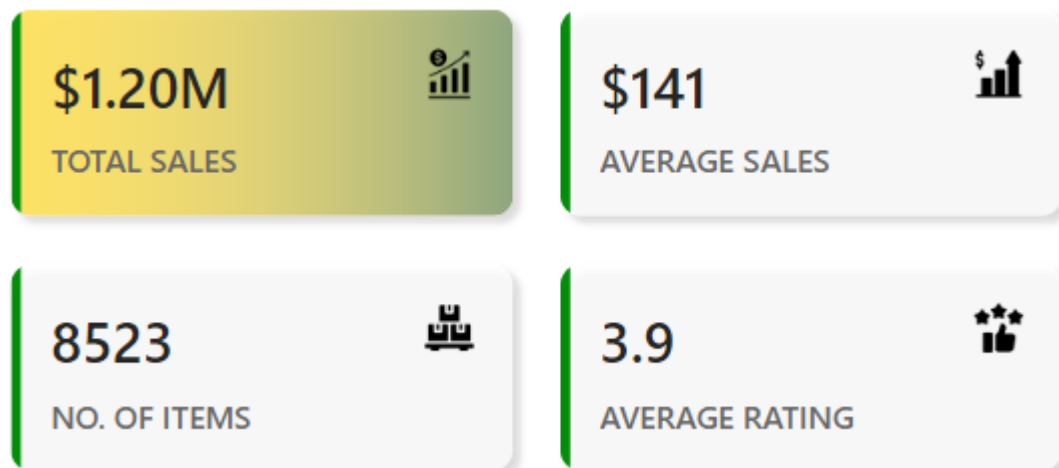
6. **Slicers:** Enabled detailed analysis of customer purchasing patterns by applying filters for demographics and regions. This interactive feature facilitated tailored marketing strategies.

The image shows a yellow slicer interface. The top section is titled 'Outlet Location Type' and contains a dropdown menu currently set to 'All'. Below the dropdown are three checkboxes: 'Tier 1', 'Tier 2', and 'Tier 3', all of which are currently unchecked. The bottom section is titled 'Item Type' and contains a dropdown menu currently set to 'All'.

7. **Metrics:** Provided a snapshot of critical performance indicators, such as average order value and customer satisfaction score. It also showed a dip in the customer satisfaction score, prompting an immediate review of customer service protocols.

OUTLET TYPE					
Outlet Type	Total Sales	No of items	Avg Sales	Avg Rating	Item Visibility
Supermarket Type2	\$131.48K	928	\$142	4	0.06
Grocery Store	\$151.94K	1083	\$140	4	0.10
Supermarket Type1	\$787.55K	5577	\$141	4	0.06
Supermarket Type3	\$130.71K	935	\$140	4	0.06

8. **Cards:** Highlighted that the total number of new customers had increased by 20% in the last quarter, signalling successful customer acquisition strategies.



CHAPTER 7

Introduction to DAX And M Language

DAX (Data Analysis Expressions) and **M Language (Power Query)** are essential tools for creating advanced calculations, transformations, and queries. Here's a report outlining how to leverage DAX and M Language in your marketing analysis.

Report on DAX Formulas and M Language Applications

i. DAX Formulas for Analysis:-

DAX is used for calculations and aggregations in Power BI. Here are specific DAX formulas relevant to your marketing data:

a. Total Sales by Channel:-

Total Sales = SUM(Sales[Revenue])

b. ROI Calculation:-

ROI can be calculated as: $ROI = \frac{SUM(Sales[Profit])}{SUM(Sales[Investment])} * 100$

c. Sales Contribution Percentage by Channel:-

To show how much each channel contributes to total sales: Sales Contribution % = $\frac{SUM(Sales[Revenue])}{CALCULATE(SUM(Sales[Revenue]), ALL(Sales[Channel]))} * 100$

d. Monthly Sales Trend:-

To calculate cumulative monthly sales:

Cumulative Sales =
 $CALCULATE(SUM(Sales[Revenue]),$
 $FILTER(ALL(Sales[Date]),$
 $Sales[Date] \leq MAX(Sales[Date]))$
)
)

e. Top Products by ROI:-

To rank products based on ROI:

Rank by ROI =
 $RANKX(ALL(Products[Product Name]),$
 $\frac{SUM(Sales[Profit])}{SUM(Sales[Investment])},$
,

DESC
)

ii. **M Language for Data Transformation:-**

M Language is used in Power Query to manipulate and clean data before it's loaded into the model. Here are some common M scripts for marketing data:

a) Filter Data by Date Range:-

Calculate ROI directly in Power Query:

```
= Table.AddColumn(Sales, "ROI", each ([Profit] / [Investment]) * 100, type number)
```

b) Add Custom Column for ROI:-

Calculate ROI directly in Power Query:

```
= Table.AddColumn(Sales, "ROI", each ([Profit] / [Investment]) * 100, type number)
```

c) Unpivot Monthly Data:-

If sales data is spread across columns for each month, use the following to unpivot:

```
= Table.UnpivotOtherColumns(Source, {"Channel", "Product"}, "Month", "Revenue")
```

d) Merge Multiple Data Sources:-

Combine data from sales and marketing tables:

```
= Table.Join(Sales, "ProductID", Marketing, "ProductID", JoinKind.Inner)
```

e) Group Data by Channel:-

Summarize sales data by channel:

```
= Table.Group(Sales, {"Channel"}, {"Total Revenue", each List.Sum([Revenue]), type number})
```

iii. **Key Use Cases for DAX and M in Marketing:-**

• Performance Metrics:-

- Use DAX to calculate KPIs like ROI, customer acquisition costs, or conversion rates.

• Dynamic Visualizations:-

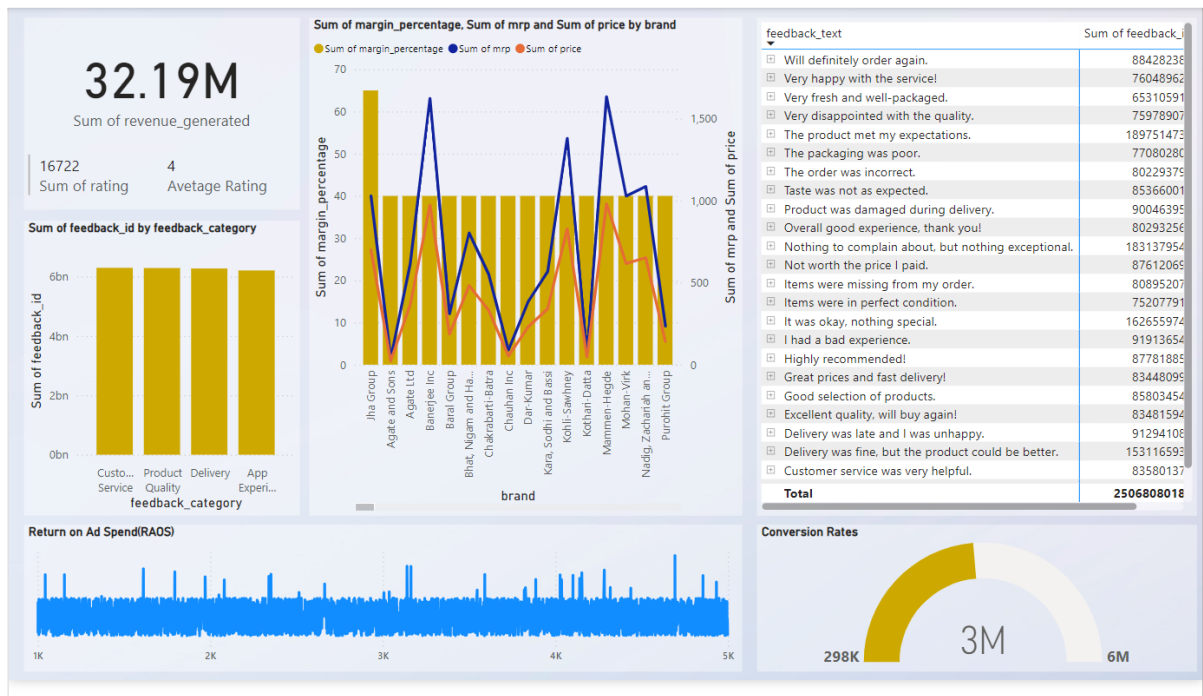
- Create measures in DAX for dynamic titles, formatting, and conditional visuals.
- **Data Cleansing:-**
 - Use M Language to filter out incomplete records or standardize inconsistent entries.
- **Hierarchical Reporting:-**
 - Build hierarchies (e.g., Country → State → City) for in-depth regional analysis.
- **Advanced Segmentation:-**
 - Use calculated tables in DAX to segment customers or channels based on profitability.

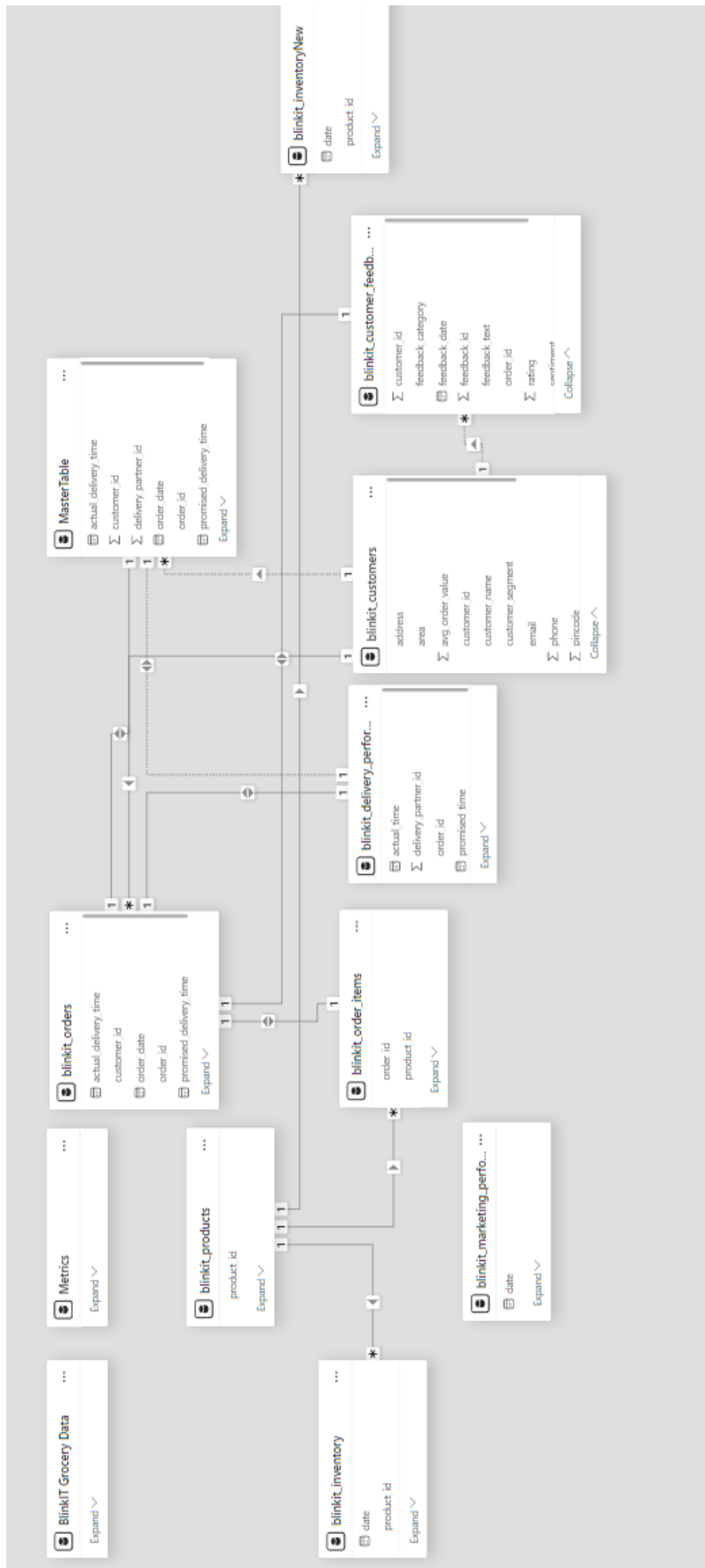
iv. Recommendations:-

- **DAX:-**
 - Use for advanced calculations, aggregations, and relationships between data tables.
 - Example: ROI breakdown by channel, ranking products, or cumulative sales trends.
- **M Language:-**
 - Use for pre-model data transformation and cleaning.
 - Example: Remove nulls, transform date formats, and merge external data sources.

Screenshot:-







Inference:-

The Blinkit Data Analysis project using Power BI effectively addressed vital business questions through a series of interactive and insightful visualisations.

- **Sales Trends:** Consistent growth and identification of peak sales periods aid in strategic planning and resource allocation.
- **Customer Demographics:** Understanding customer demographics helps tailor marketing campaigns and improve customer service.
- **Inventory Optimisation:** Insights into stock levels and turnover rates support better inventory management, reducing overstock and stockout risks.
- **Delivery Efficiency:** Analysing delivery times and success rates helps optimise logistics and improve customer satisfaction.
- **Sales Performance:** Comparative analysis of sales performance across regions and categories informs strategic decisions to boost underperforming areas and leverage successful strategies.

These detailed inferences from the Power BI analysis of Blinkit's data provide a comprehensive understanding of the business's operational strengths and areas for improvement, guiding better decision-making and strategic planning.

Tools and Technologies Used:-

1. Power BI: Used for data visualization and dashboard creation.
2. Power Query: Enabled data cleaning, transformation, and merging from various sources.
3. Interactive Visualizations: Customizable visualizations for representing data most insightfully.
4. Microsoft Excel: Used for Analysing and cleaning the data.

Benefits:-

1. Data-driven decision-making: The project provided actionable insights to inform strategic business decisions.
2. Improved inventory management: Optimized stock levels and turnover rates reduced overstock and stockout risks.
3. Enhanced customer service: Targeted marketing campaigns and improved service quality improved customer satisfaction.
4. Increased efficiency: Streamlined workflows and reduced friction for data analysts and engineers.

Conclusion:-

The Blinkit Data Analyst project successfully utilized Power BI to analyze sales data over a decade, providing valuable insights and actionable recommendations. The project demonstrated the effectiveness of data visualization in driving business decisions, improving operational efficiency, and enhancing customer satisfaction.