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Data Analysis, Visualisation, and Interactive Dashboard: Unveiling Insights from DMart Tamil Nadu Grocery Sample Sales Data using Excel

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INTRODUCTION:

In the dynamic realm of contemporary business, data analysis serves as a powerful tool for informed decision-making and strategic planning. This project is a focused exploration of the DMart Tamil Nadu Grocery Sales Sample Data, a substantial dataset comprising details of **9994 orders** from **2021 Jan to 2023 Aug 10**. The dataset encompasses a wide array of variables including **order ID, customer names, product categories, quantities, regions, cities, dates, prices, payment modes, and profits**. Through meticulous data cleaning and Excel's capabilities, our goal is to uncover insights into profit trends, city-specific performance, payment method preferences, and the influence of product categories on profitability. This endeavour goes beyond conventional data representation, as we construct an interactive dashboard for dynamic exploration of insights. As we embark on this journey, our objective is to enhance data analysis skills, Excel proficiency, and impactful visualization techniques. Rooted in authenticity and a genuine pursuit of knowledge, we aim to contribute meaningful perspectives to retail management, enriching decision-making and strategic perspectives.

AIM:

The primary aim of this project is to perform a comprehensive and insightful analysis of the DMart Tamil Nadu Grocery Sales Sample Data, which encompasses detailed information from 9994 individual orders. This analysis is driven by the aspiration to unravel multifaceted insights that can offer valuable perspectives on various dimensions of grocery sales within the context of DMart supermarkets.

1. Profit Trends: Analyse profit trends over time, **identifying patterns** and contributing factors to better understand the financial dynamics.

2. City Performance: Evaluate sales, profits, and customer **behaviour across different** cities in Tamil Nadu to gain insights into regional performance.

3. Payment Preferences: Explore payment method preferences (e.g., UPI, cash, card) to understand **common transaction** trends and implications.

4. Product Categories: Investigate how specific **product categories impact** overall **profitability** by analysing sales quantities and profits.

5. Interactive Dashboard: Develop an engaging dashboard to **dynamically visualize insights**, enhancing user understanding and exploration.

6. Skill Enhancement: Improve data analysis and Excel proficiency through meticulous cleaning, analysis, and visualization.

In essence, the overarching aim of the project is to derive actionable insights from the DMart Tamil Nadu Grocery Sales Sample Data through rigorous analysis and visualization. By achieving these objectives, the project endeavours to offer meaningful contributions to the understanding of grocery sales dynamics within the DMart supermarket context.

PROCEDURE:

1. Data Collection and Cleaning:
   - Collected the DMart Tamil Nadu Grocery Sales Sample Data containing information about 9994 orders.
   - Thoroughly examined the dataset for inconsistencies, missing values, and duplicates.
   - Cleaned the dataset by removing null values, duplicates, and ensuring consistent formatting.

2. Data Exploration and Preparation:

   - Explored the dataset to understand the structure of variables and their relationships.

   - Converted relevant columns to appropriate data types (e.g., dates, numerical values).

   - Grouped data as needed to facilitate analysis (e.g., by year, city, payment method, product category).

Order ID	Customer	Category	Sub Category	Quantity	Region	City	Order Date	DAY	MONTH	YEAR	Actual Price	Discount	Payment mode	Sales	Profit	Rating
OD1	Harish	Oil & Masala	Masalas	7	North	Vellore	26-12-2021	26	Dec	2021	₹1,404.48	12.00%	Card	₹1,254.00	₹401.28	3
OD2	Sudha	Beverages	Health Drinks	4	South	Krishnagiri	11-02-2023	11	Feb	2023	₹883.82	18.00%	Upi	₹749.00	₹149.80	5
OD3	Hussain	Food Grains	Atta & Flour	6	West	Perambalur	28-09-2021	28	Sep	2021	₹2,855.60	21.00%	Card	₹2,360.00	₹165.20	3
OD4	Jackson	Fruits & Veggies	Fresh Vegetables	3	South	Dharmapuri	25-12-2021	25	Dec	2021	₹1,120.00	25.00%	Card	₹896.00	₹89.60	4
OD5	Ridhesh	Food Grains	Organic Staples	5	South	Ooty	22-02-2021	22	Feb	2021	₹2,967.30	26.00%	Cash	₹2,355.00	₹918.45	5
OD6	Adavan	Food Grains	Organic Staples	7	West	Dharmapuri	30-11-2022	30	Nov	2022	₹2,904.30	26.00%	Upi	₹2,305.00	₹322.70	4
OD7	Jonas	Fruits & Veggies	Fresh Vegetables	1	West	Trichy	11-09-2021	11	Sep	2021	₹1,098.58	33.00%	Upi	₹826.00	₹346.92	5
OD8	Hafiz	Fruits & Veggies	Fresh Fruits	1	West	Ramanadhapuram	30-08-2021	30	Aug	2021	₹2,438.04	32.00%	Cash	₹1,847.00	₹147.76	4
OD9	Hafiz	Bakery	Biscuits	9	West	Tirunelveli	12-01-2022	12	Jan	2022	₹972.93	23.00%	Upi	₹791.00	₹181.93	3
OD10	Krithika	Bakery	Cakes	9	West	Chennai	30-05-2022	30	May	2022	₹2,279.65	27.00%	Card	₹1,795.00	₹484.65	3
OD11	Ganesh	Snacks	Chocolates	7	West	Karur	10-03-2021	10	Mar	2021	₹2,150.39	13.00%	Upi	₹1,903.00	₹437.69	5
OD12	Yadav	Eggs, Meat & Fish	Eggs	6	West	Namakkal	18-01-2023	18	Jan	2023	₹771.10	10.00%	Cash	₹701.00	₹308.44	3
OD13	Sharon	Snacks	Cookies	3	South	Dindigul	17-06-2022	17	Jun	2022	₹1,974.21	19.00%	Cash	₹1,659.00	₹315.21	3
OD14	Peer	Fruits & Veggies	Fresh Vegetables	5	West	Kanyakumari	04-12-2022	4	Dec	2022	₹1,596.25	25.00%	Card	₹1,277.00	₹63.85	3
OD15	Sundar	Eggs, Meat & Fish	Chicken	8	Central	Kanyakumari	19-07-2021	19	Jul	2021	₹1,013.82	22.00%	Upi	₹831.00	₹207.75	5
OD16	Ramesh	Oil & Masala	Edible Oil & Ghee	4	Central	Krishnagiri	04-01-2023	4	Jan	2023	₹1,598.40	11.00%	Card	₹1,440.00	₹100.80	5
OD17	Alan	Bakery	Cakes	9	Central	Dharmapuri	24-11-2021	24	Nov	2021	₹2,147.84	28.00%	Card	₹1,678.00	₹318.82	2
OD18	Arutra	Beverages	Health Drinks	6	West	Bodi	22-04-2023	22	Apr	2023	₹1,924.23	19.00%	Cash	₹1,617.00	₹113.19	4
OD19	Haseena	Eggs, Meat & Fish	Mutton	4	West	Tenkasi	08-09-2022	8	Sep	2022	₹2,371.95	35.00%	Upi	₹1,757.00	₹386.54	3
OD20	Verma	Beverages	Soft Drinks	1	West	Kanyakumari	29-06-2021	29	Jun	2021	₹892.68	29.00%	Card	₹692.00	₹159.16	4
OD21	Hafiz	Beverages	Health Drinks	4	West	Vellore	16-01-2023	16	Jan	2023	₹621.18	19.00%	Card	₹522.00	₹208.80	3
OD22	Alan	Food Grains	Dals & Pulses	6	Central	Karur	01-07-2023	1	Jul	2023	₹1,071.24	13.00%	Cash	₹948.00	₹47.40	3
OD23	Haseena	Beverages	Soft Drinks	4	Central	Krishnagiri	24-08-2021	24	Aug	2021	₹947.38	34.00%	Card	₹707.00	₹148.47	5
OD24	Alan	Fruits & Veggies	Organic	8	East	Tenkasi	25-04-2022	25	Apr	2022	₹1,250.01	29.00%	Card	₹969.00	₹77.52	5
OD25	Sharon	Eggs, Meat & Fish	Eggs	5	West	Ooty	15-11-2022	15	Nov	2022	₹1,221.00	11.00%	Card	₹1,100.00	₹495.00	4
OD26	Krithika	Snacks	Chocolates	7	West	Tirunelveli	29-01-2023	29	Jan	2023	₹2,244.42	11.00%	Cash	₹2,022.00	₹202.20	4
OD27	Muneer	Snacks	Cookies	9	West	Trichy	26-06-2022	26	Jun	2022	₹605.92	12.00%	Card	₹541.00	₹43.28	2
OD28	Jackson	Bakery	Biscuits	2	East	Viluppuram	30-01-2022	30	Jan	2022	₹1,194.38	22.00%	Upi	₹979.00	₹401.39	4
OD29	Veronica	Beverages	Soft Drinks	2	East	Krishnagiri	18-07-2021	18	Jul	2021	₹2,425.36	22.00%	Upi	₹1,988.00	₹874.72	4
OD30	Shah	Oil & Masala	Masalas	8	East	Kanyakumari	13-08-2021	13	Aug	2021	₹1,157.13	17.00%	Cash	₹989.00	₹69.23	3
OD31	Ramesh	Beverages	Soft Drinks	4	East	Dharmapuri	08-04-2022	8	Apr	2022	₹2,287.80	24.00%	Cash	₹1,845.00	₹166.05	4
OD32	Mathew	Snacks	Noodles	1	East	Vellore	26-03-2023	26	Mar	2023	₹1,554.00	11.00%	Upi	₹1,400.00	₹420.00	2
OD33	Akash	Oil & Masala	Edible Oil & Ghee	7	East	Trichy	15-04-2022	15	Apr	2022	₹2,725.38	26.00%	Card	₹2,163.00	₹670.53	2
OD34	Anu	Oil & Masala	Masalas	1	East	Madurai	04-01-2023	4	Jan	2023	₹2,263.26	34.00%	Upi	₹1,689.00	₹337.80	4
OD35	Anu	Beverages	Health Drinks	6	Central	Vellore	01-10-2021	1	Oct	2021	₹1,067.88	32.00%	Card	₹809.00	₹80.90	4
OD36	Sabeela	Eggs, Meat & Fish	Eggs	7	Central	Tirunelveli	19-04-2022	19	Apr	2022	₹1,543.30	22.00%	Card	₹1,265.00	₹569.25	4
OD37	James	Beverages	Soft Drinks	6	Central	Salem	11-02-2022	11	Feb	2022	₹1,260.90	35.00%	Cash	₹934.00	₹56.04	3
OD38	Willams	Fruits & Veggies	Organic	4	Central	Ramanadhapuram	10-01-2022	10	Jan	2022	₹1,570.64	16.00%	Card	₹1,354.00	₹446.82	5
OD39	Jonas	Fruits & Veggies	Fresh Fruits	5	Central	Chennai	01-08-2021	1	Aug	2021	₹2,083.69	19.00%	Cash	₹1,751.00	₹280.16	2

3. City Performance Evaluation:

   - Grouped data by city and calculated total sales and profits for each city.

   - Used Excel's pivot tables to summarize city-specific data:

     - Step 1: Click on any cell within the dataset.

     - Step 2: Go to the "Insert" tab, click "PivotTable," and choose the range of data you want to analyse. In the "Create PivotTable" dialog box, select the destination for the pivot table (e.g., a new worksheet), and click "OK."

   - Created clustered column bar graphs to compare city-wise sales and profits:

     - Step 1: Select the columns "City," "Total Sales," and "Total Profits" from the dataset.

     - Step 2: Go to the "Insert" tab, click "PivotChart," and choose "Clustered Column."

     - Step 3: Drag "City" to the Axis (Categories) field, "Total Sales" to the Values field, and "Total Profits" to the Values field. Format the chart as needed.

4. Payment Method Preferences:

- Analysed payment modes (UPI, cash, card) by calculating the percentage of transactions for each mode.

- Generated a doughnut graph to visually represent payment method preferences.

5. Product Category Impact:

  - Calculated profits for each product category by summing profits for related orders.

  - Organized data into pivot tables to summarize category-wise profits:

    - Step 1: Click on any cell within the dataset.

    - Step 2: Go to the "Insert" tab, click "PivotTable," and choose the range of data you want to analyse. In the "Create PivotTable" dialog box, select the destination for the pivot table (e.g., a new worksheet), and click "OK."

  - Created a clustered bar graph to display the impact of different product categories on overall profitability.

6. Profit Trend Analysis:

  - Calculated profit margins for each order using the formula: Profit = Sales Price - Actual Price.

  - Aggregated profits by year and month to understand profit trends over time.

  - Visualized profit trends using line graphs:

    - Step 1: Select the columns "Year," "Month," and "Profit" from the dataset.

    - Step 2: Go to the "Insert" tab, click "PivotChart," and choose "Line Chart."

    - Step 3: Drag "Year" to the Axis (Categories) field, "Month" to the Axis (Categories) field, and "Profit" to the Values field. Format the chart as needed.

7. Interactive Dashboard Creation:

  - Compiled the derived insights into an interactive dashboard using separate Excel worksheets.

  - Incorporated slicers to enable dynamic filtering and exploration by users:

    - Step 1: Select a cell within the pivot table or pivot chart.

    - Step 2: Go to the "Insert" tab, click "Slicer," and choose the fields you want to use as filters. Arrange the slicers on the dashboard and connect them to the pivot tables and charts using "Report Connections."
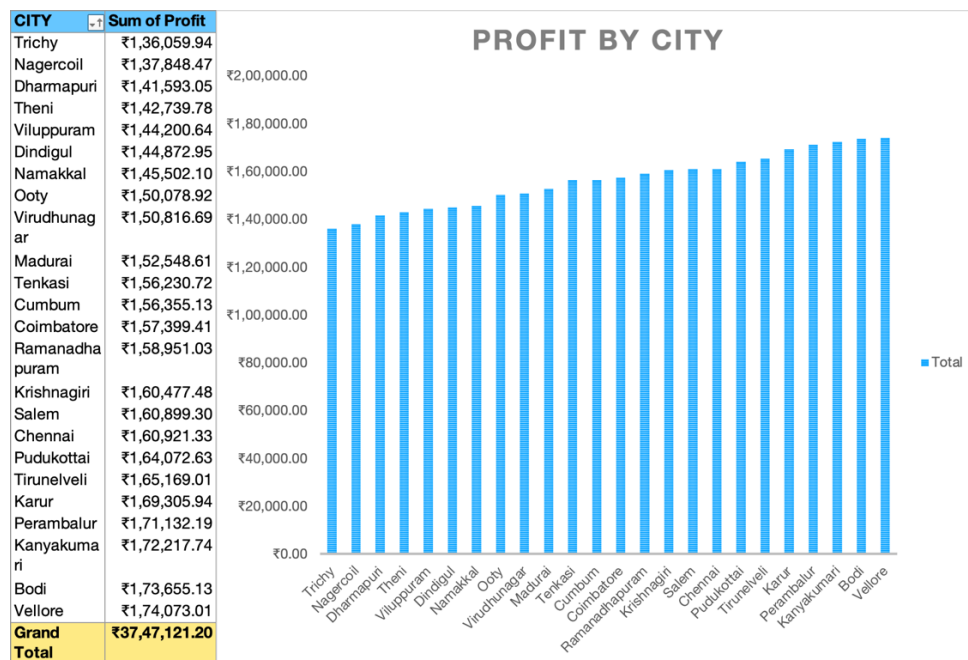
  - Organized and formatted the dashboard elements for a visually appealing and user-friendly experience.

RESULT AND OUTPUT:

The thorough analysis of the DMart Tamil Nadu Grocery Sales Sample Data has generated significant insights, showcasing valuable outcomes in various dimensions:

1. Profitable City Identification:
   - **Vellore** emerges as the highest profit-making city, providing a focal point for strategic resource allocation and expansion efforts.

CITY	Sum of Profit
Trichy	₹1,36,059.94
Nagercoil	₹1,37,848.47
Dharmapuri	₹1,41,593.05
Theni	₹1,42,739.78
Viluppuram	₹1,44,200.64
Dindigul	₹1,44,872.95
Namakkal	₹1,45,502.10
Ooty	₹1,50,078.92
Virudhunagar	₹1,50,816.69
Madurai	₹1,52,548.61
Tenkasi	₹1,56,230.72
Cumbum	₹1,56,355.13
Coimbatore	₹1,57,399.41
Ramanadhapuram	₹1,58,951.03
Krishnagiri	₹1,60,477.48
Salem	₹1,60,899.30
Chennai	₹1,60,921.33
Pudukottai	₹1,64,072.63
Tirunelveli	₹1,65,169.01
Karur	₹1,69,305.94
Perambalur	₹1,71,132.19
Kanyakumari	₹1,72,217.74
Bodi	₹1,73,655.13
Vellore	₹1,74,073.01
Grand Total	**₹37,47,121.20**

2. Preferred Payment Method Insights:
   - **UPI** stands out as the most commonly used payment mode and **Cash** mode payment has gained more profit, offering actionable information to enhance payment processes and user experience.

PAYMENT METHOD	Sum of Profit
Card	₹12,33,028.35
Cash	₹12,78,661.83
Upi	₹12,35,431.02
Grand Total	₹37,47,121.20
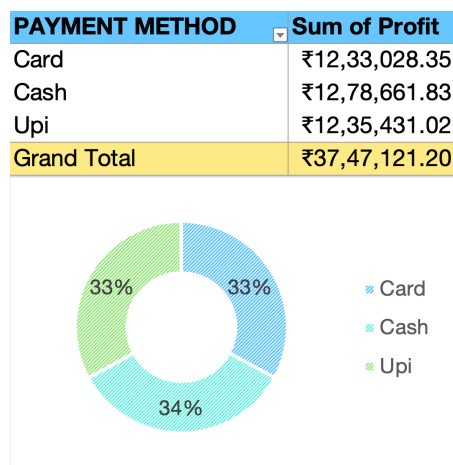
3. Lucrative Product Category Recognition:

- The profitability analysis pinpoints **health drinks** as the most lucrative category, guiding inventory management and targeted marketing strategies.

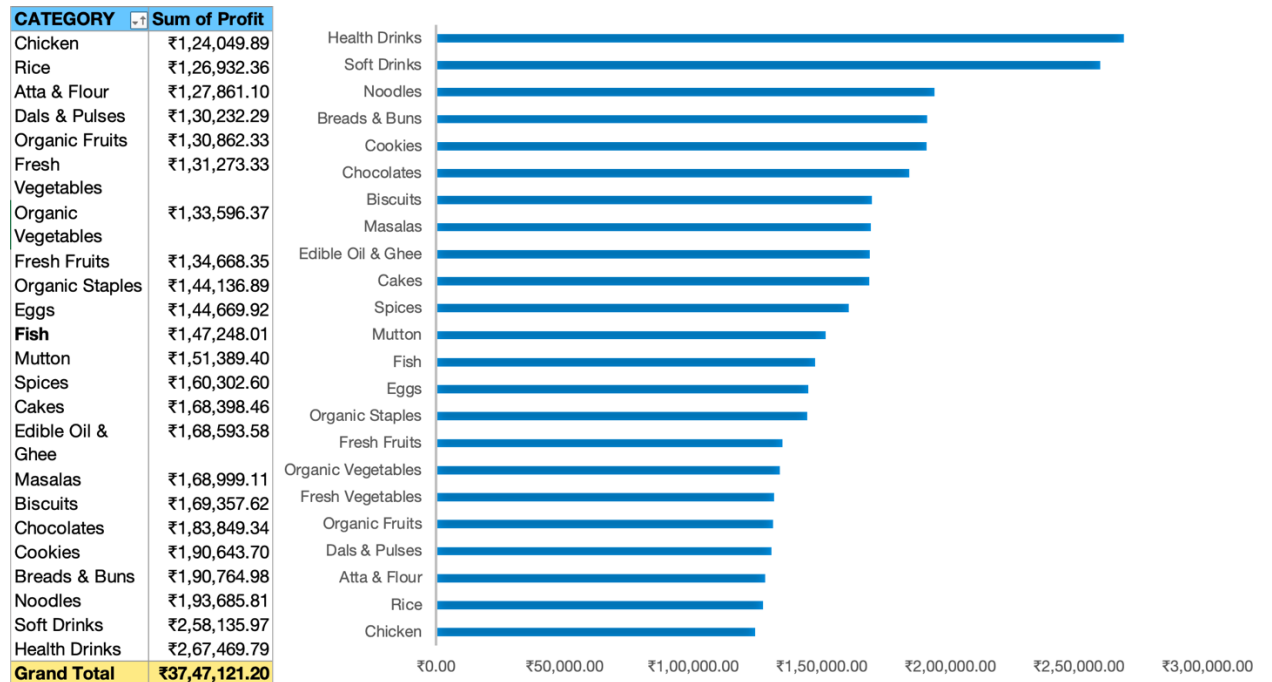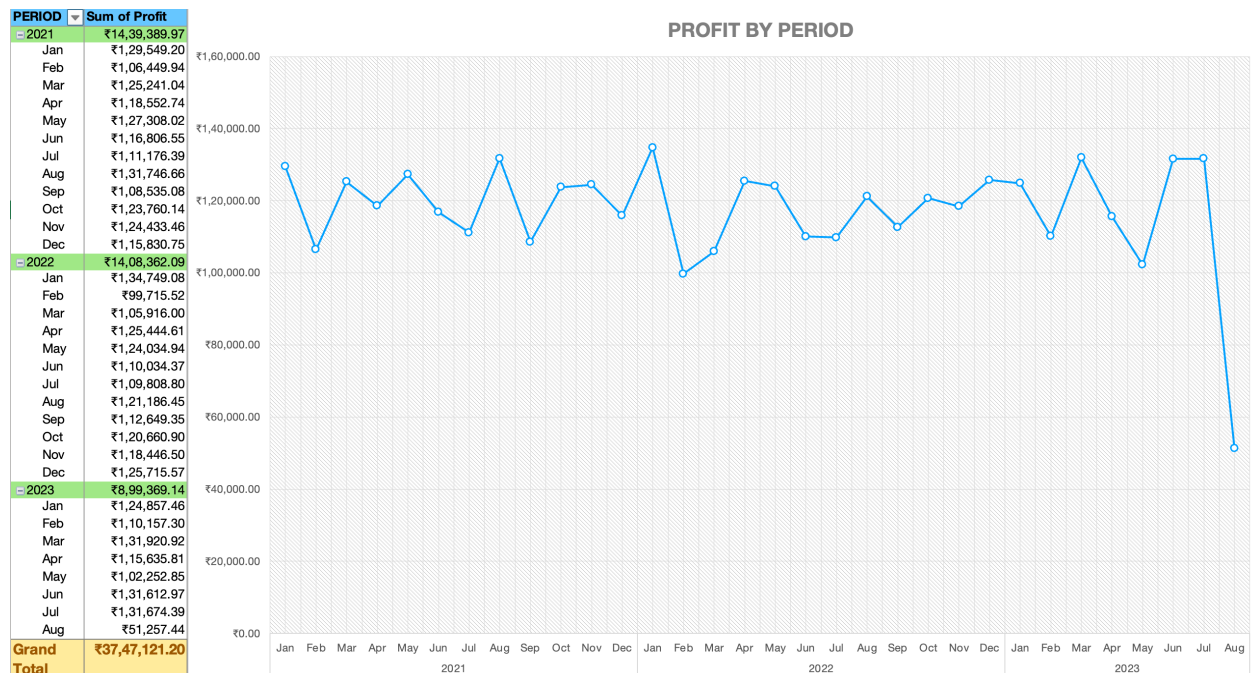| CATEGORY	Sum of Profit
Chicken	₹1,24,049.89
Rice	₹1,26,932.36
Atta & Flour	₹1,27,861.10
Dals & Pulses	₹1,30,232.29
Organic Fruits	₹1,30,862.33
Fresh Vegetables	₹1,31,273.33
Organic Vegetables	₹1,33,596.37
Fresh Fruits	₹1,34,668.35
Organic Staples	₹1,44,136.89
Eggs	₹1,44,669.92
Fish	₹1,47,248.01
Mutton	₹1,51,389.40
Spices	₹1,60,302.60
Cakes	₹1,68,398.46
Edible Oil & Ghee	₹1,68,593.58
Masalas	₹1,68,999.11
Biscuits	₹1,69,357.62
Chocolates	₹1,83,849.34
Cookies	₹1,90,643.70
Breads & Buns	₹1,90,764.98
Noodles	₹1,93,685.81
Soft Drinks	₹2,58,135.97
Health Drinks	₹2,67,469.79
Grand Total	**₹37,47,121.20**

4. Visualized Profit Trends:

- The visual representation of **profit trends** elucidates growth patterns and fluctuations, aiding in recognizing profitable periods.

PERIOD	Sum of Profit
⊟2021	**₹14,39,389.97**
Jan	₹1,29,549.20
Feb	₹1,06,449.94
Mar	₹1,25,241.04
Apr	₹1,18,552.74
May	₹1,27,308.02
Jun	₹1,16,806.55
Jul	₹1,11,176.39
Aug	₹1,31,746.66
Sep	₹1,08,535.08
Oct	₹1,23,760.14
Nov	₹1,24,433.46
Dec	₹1,15,830.75
⊟2022	**₹14,08,362.09**
Jan	₹1,34,749.08
Feb	₹99,715.52
Mar	₹1,05,916.00
Apr	₹1,25,444.61
May	₹1,24,034.94
Jun	₹1,10,034.37
Jul	₹1,09,808.80
Aug	₹1,21,186.45
Sep	₹1,12,649.35
Oct	₹1,20,660.90
Nov	₹1,18,446.50
Dec	₹1,25,715.57
⊟2023	**₹8,99,369.14**
Jan	₹1,24,857.46
Feb	₹1,10,157.30
Mar	₹1,31,920.92
Apr	₹1,15,635.81
May	₹1,02,252.85
Jun	₹1,31,612.97
Jul	₹1,31,674.39
Aug	₹51,257.44
Grand Total	**₹37,47,121.20**

PROFIT BY PERIOD

5. Interactive Dashboard Empowerment:

   - The interactive dashboard amplifies data exploration through **dynamic filters**, facilitating detailed insights and informed decision-making.
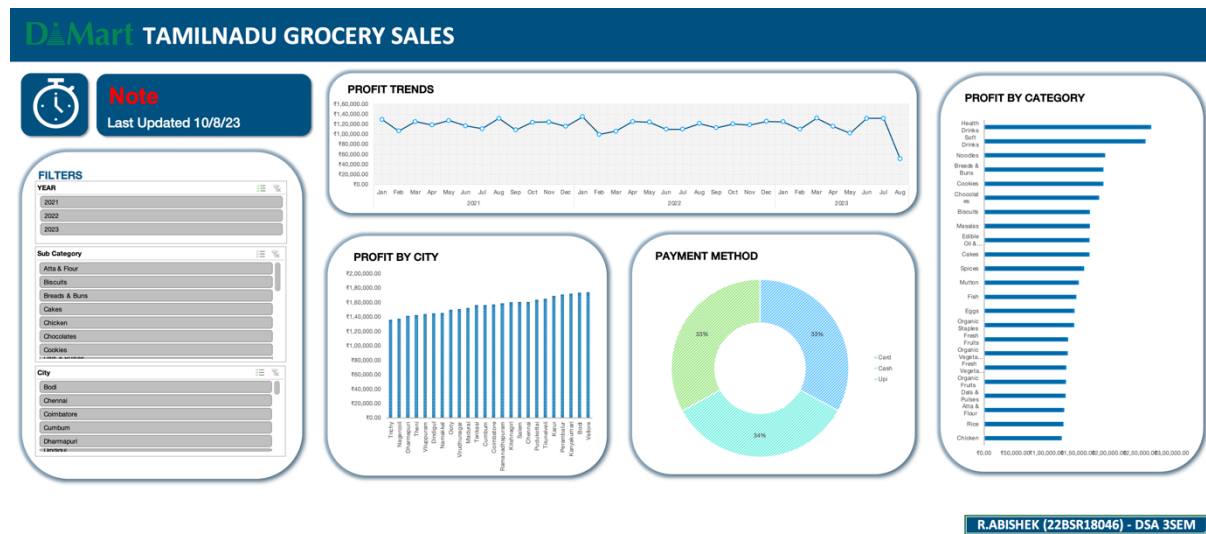
This section concisely conveys the key findings of the data analysis process, highlighting significant insights and the **interactive dashboard's** ability to enhance data exploration and interpretation.

CONCLUSION:

Through meticulous analysis and visual representation of the DMart Tamil Nadu Grocery Sales Sample Data, this project has unveiled valuable insights into profitable cities, payment preferences, and product categories. The interactive dashboard's dynamic filters empower data exploration, enhancing decision-making capabilities. These findings equip us with actionable intelligence to optimize strategies, refine operations, and drive growth in the retail domain.

REFERENCE:

https://www.kaggle.com/datasets/mohamedharris/supermart-grocery-sales-retail-analytics-dataset