Delivering Right, Delivering On Time: Understanding Gaps in The Supply Chain Performance

ARYA CHAVAN

Timely and complete deliveries are vital in supply chains. They ensure customer satisfaction, business reliability, and overall operational efficiency. Effective management of these deliveries enhances relationships with suppliers and customers alike.

- Arya Chavan

Problem Statement

In today's competitive and fast-moving market, customer expectations are higher than ever. However, many companies struggle to consistently deliver on time and in full.

Why? The reasons include:

- Fragmented logistics
- Lack of real-time visibility
- Operational bottlenecks

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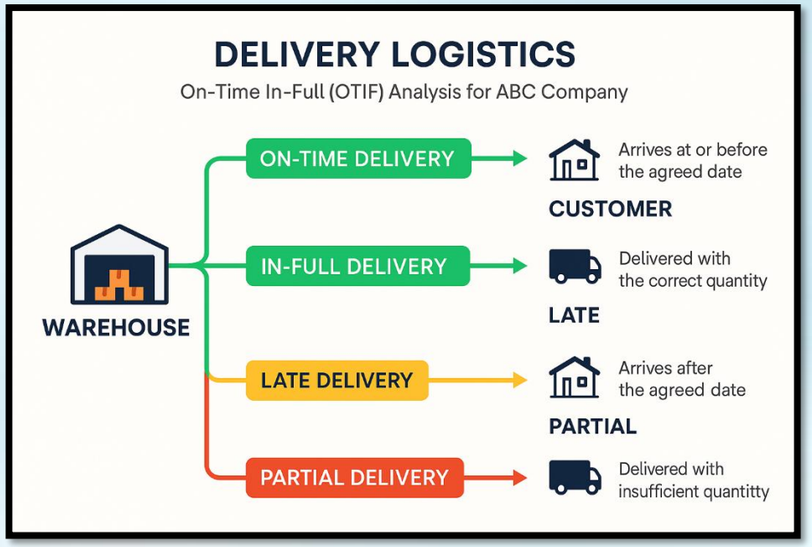
These delays can result in **customer churn, financial losses, and damaged credibility.**

The solution is a data-driven approach using tools like Power BI to **monitor OTIF performance, identify problems early, and improve decision-making and delivery efficiency.**



Objectives

- To measure the number of orders placed and delivered over time.
- To calculate and monitor the On-Time Delivery (OTD) and In-Full Delivery (IFD) rates.
- To identify patterns in late deliveries and propose mitigate actions.
- To determine which customers, cities, or product categories underperform against OTIF targets.
- To build dynamic Power BI dashboards for tracking delivery performance.
- To align operational performance with customer expectations and contractual delivery agreements.
- To highlight the importance of weekend vs weekday orders on logistics efficiency.
- To evaluate how actual performance compares to agreed customer targets.
- To improve delivery reliability in order to increase customer retention.
- To provide recommendations for strategic interventions in underperforming areas.

Importance of Timely Deliveries

1 **Customer Satisfaction**

On-time deliveries meet customer expectations.

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2 **Inventory Management**

Timely deliveries facilitate efficient inventory management.

3 **Supply Chain Efficiency**

Ensuring products are delivered on time increases overall supply chain efficiency.

4 **Cost Reduction**

Delays can incur additional costs.

Consequences of Delayed Deliveries

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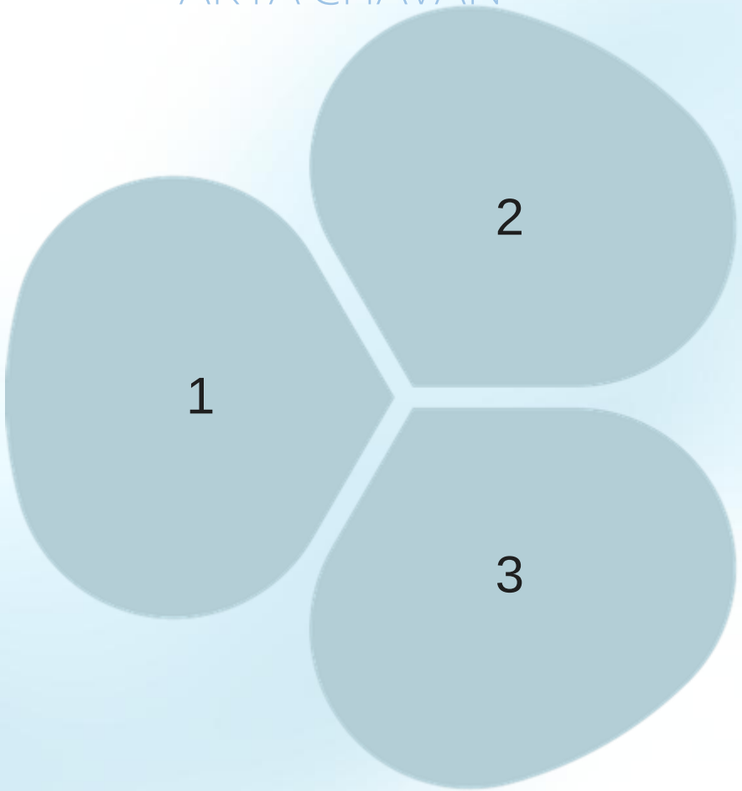
Loss of Revenue

Delays can directly impact sales, especially in industries with high competition.



Increased Operational Costs

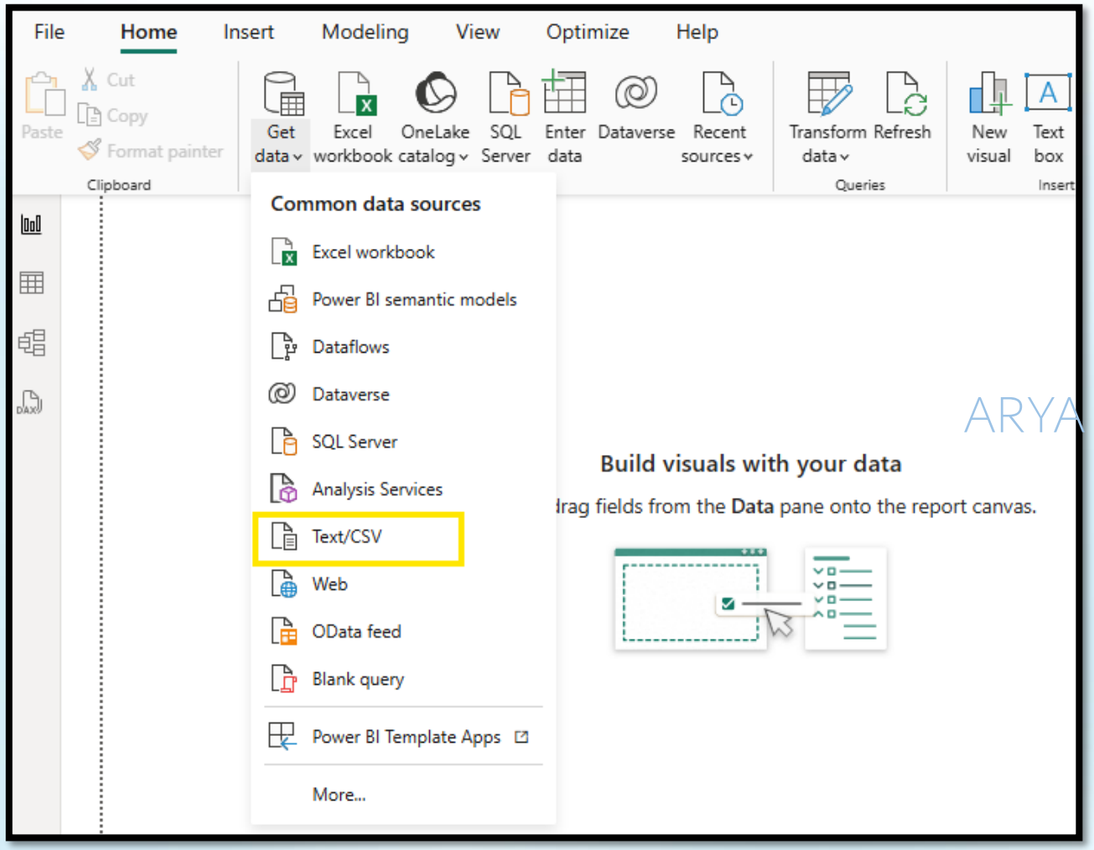
Late deliveries require last-minute adjustments, leading to increased costs.

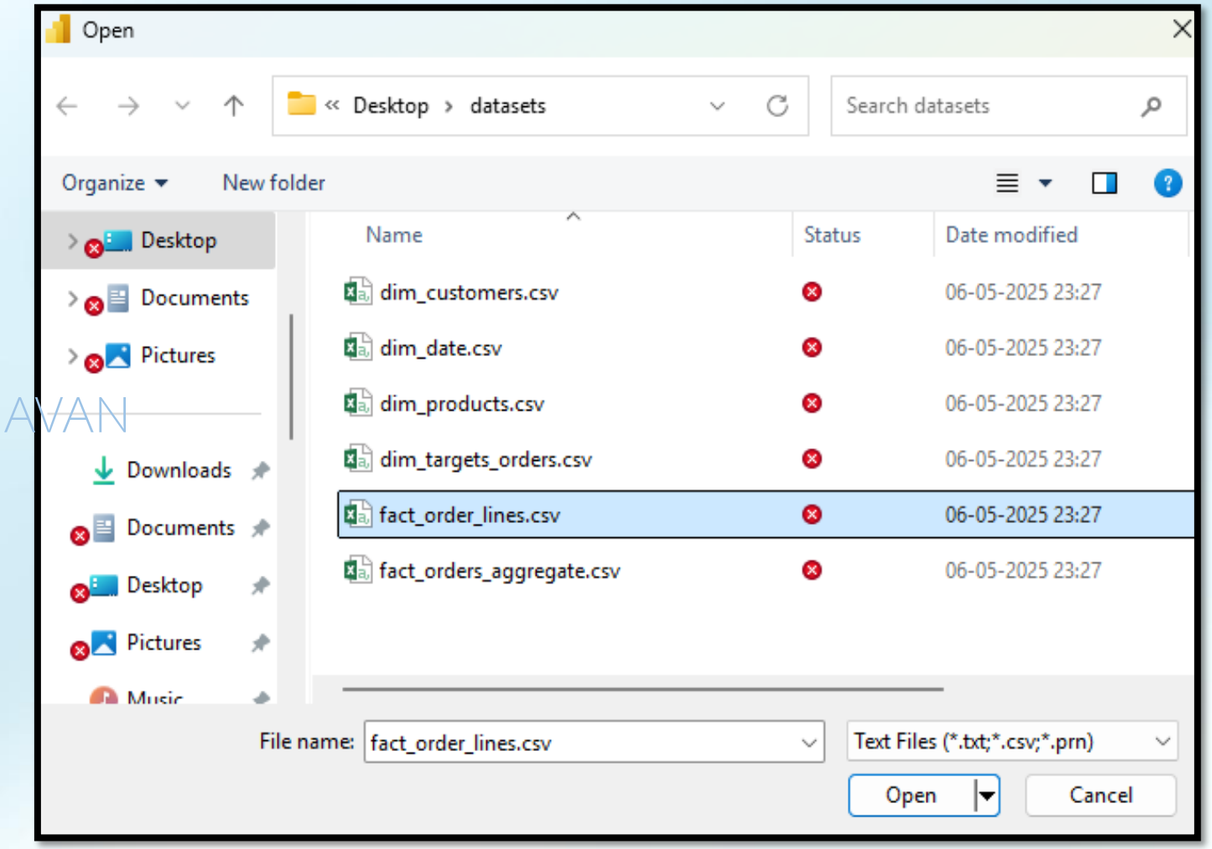
Damage to Reputation

Consistent delays can harm a company's reputation and trust resulting in **Customer Churn**.

Methodology

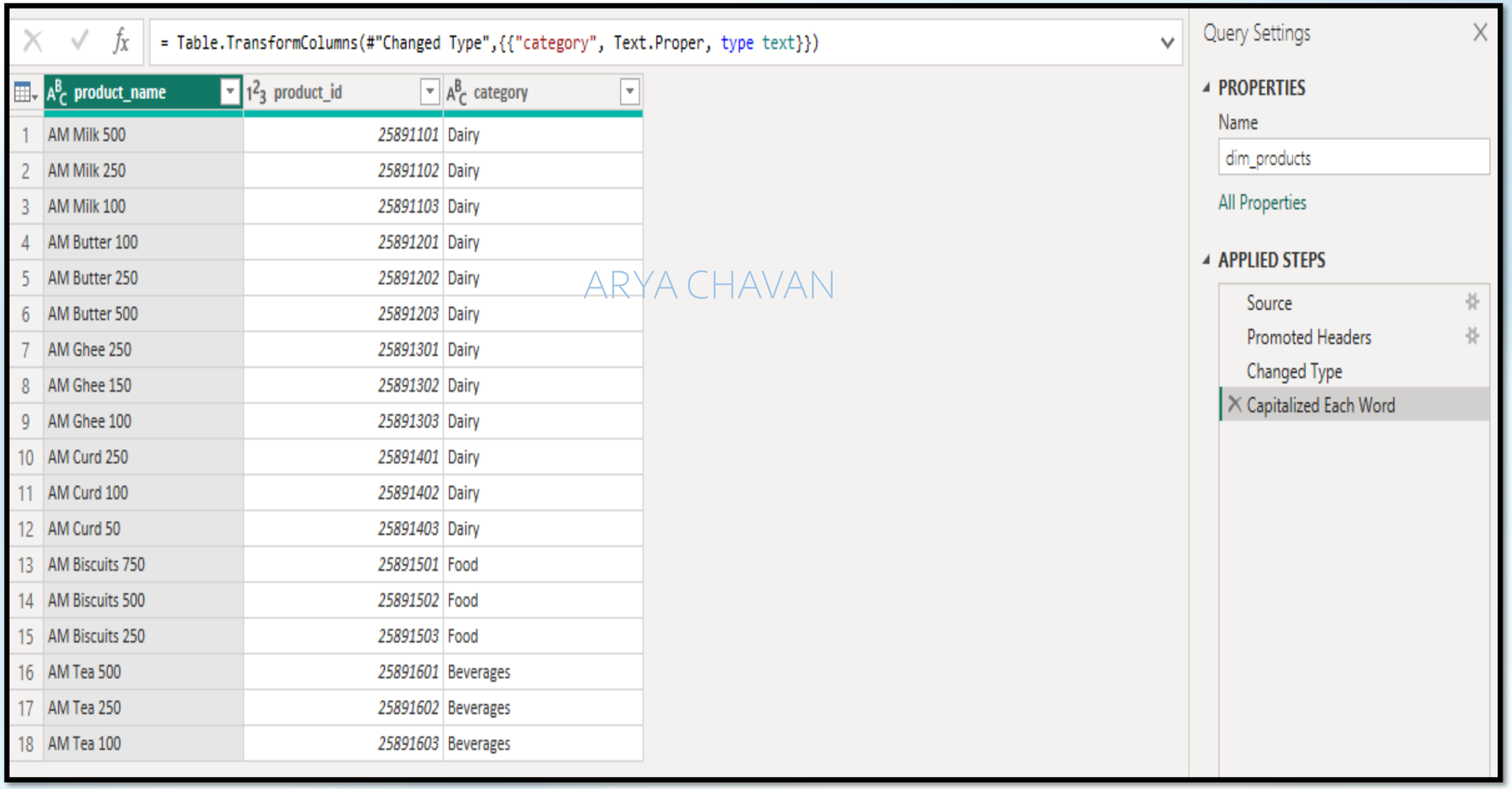
1. Data Connection





Methodology

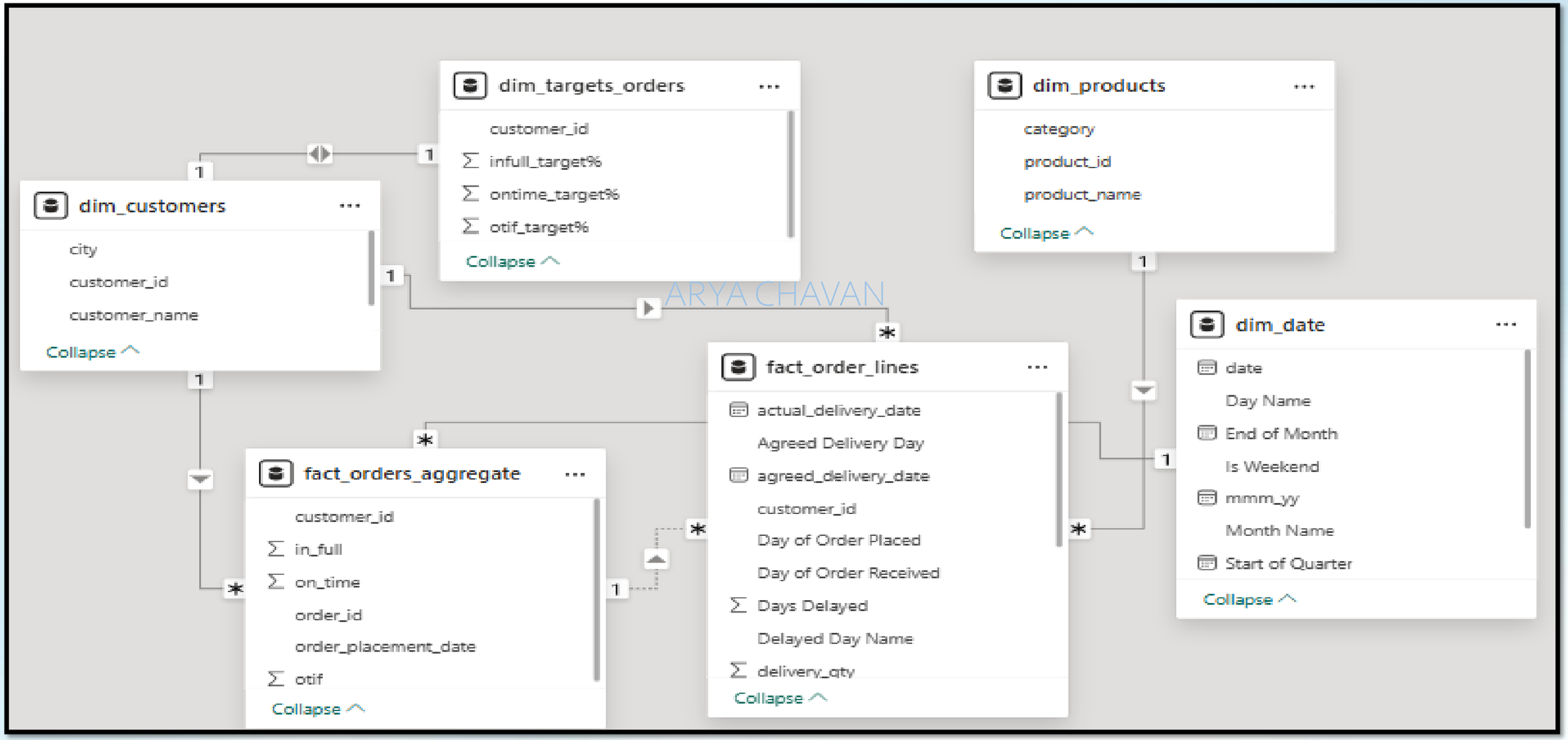
2. Data Cleaning



	product_name	product_id	category
1	AM Milk 500	25891101	Dairy
2	AM Milk 250	25891102	Dairy
3	AM Milk 100	25891103	Dairy
4	AM Butter 100	25891201	Dairy
5	AM Butter 250	25891202	Dairy
6	AM Butter 500	25891203	Dairy
7	AM Ghee 250	25891301	Dairy
8	AM Ghee 150	25891302	Dairy
9	AM Ghee 100	25891303	Dairy
10	AM Curd 250	25891401	Dairy
11	AM Curd 100	25891402	Dairy
12	AM Curd 50	25891403	Dairy
13	AM Biscuits 750	25891501	Food
14	AM Biscuits 500	25891502	Food
15	AM Biscuits 250	25891503	Food
16	AM Tea 500	25891601	Beverages
17	AM Tea 250	25891602	Beverages
18	AM Tea 100	25891603	Beverages

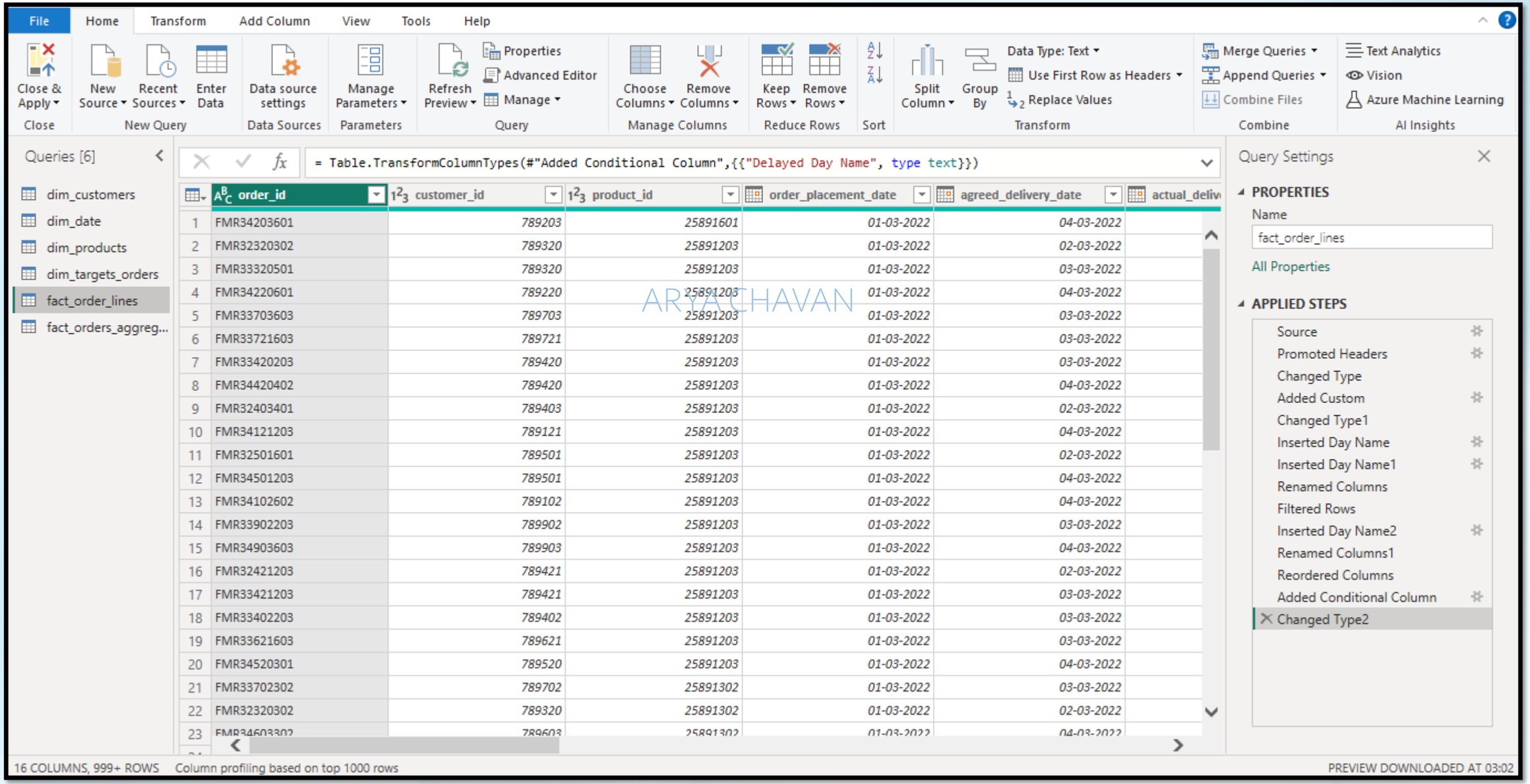
Methodology

3. Data Modelling



Methodology

4. Data Processing



Methodology

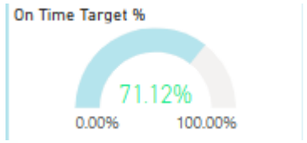
DAX Calculations:

1. Average target In-full % = AVERAGE(dim_targets_orders[infull_target%])
2. Average target On-time % = AVERAGE(dim_targets_orders[ontime_target%])
3. Average target OTIF % = AVERAGE(dim_targets_orders[otif_target%])
4. Avg InFull % = AVERAGE((fact_order_lines[In Full]))
5. Avg OnTime % = AVERAGE((fact_order_lines[On Time]))
6. Avg OTIF % = AVERAGE((fact_order_lines[On Time In Full]))
7. Failed OTIF % = 100 - [OTIF_Percentage]
8. Failed_OTIF_Orders = CALCULATE(COUNTROWS(fact_order_lines),fact_order_lines[On Time In Full] = 0)
9. Incomplete_Orders =
10. CALCULATE(COUNTROWS(fact_order_lines),fact_order_lines[In Full] = 0)
11. InFull Target Gap = [Average target In-full %] - [Avg InFull %]
12. InFull_Percentage = (DIVIDE(CALCULATE(COUNTROWS(fact_order_lines), fact_order_lines[In Full] = 1),COUNTROWS(fact_order_lines)))*100
13. Late_Orders = CALCULATE(COUNTROWS(fact_order_lines),fact_order_lines[On Time] = 0)
14. OnTime Target Gap = [Average target On-time %] - [Avg OnTime %]
15. OnTime_Percentage = (DIVIDE(CALCULATE(COUNTROWS(fact_order_lines), fact_order_lines[On Time] = 1),COUNTROWS(fact_order_lines)))*100
16. OTIF Target Gap = [Average target OTIF %] - [Avg OTIF %]
17. OTIF_Percentage = (DIVIDE(CALCULATE(COUNTROWS(fact_order_lines), fact_order_lines[On Time In Full] = 1),COUNTROWS(fact_order_lines)))*100

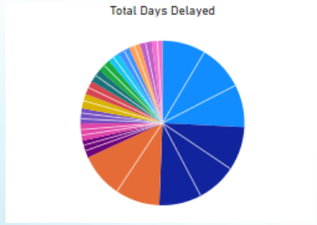
Methodology

Charts Development

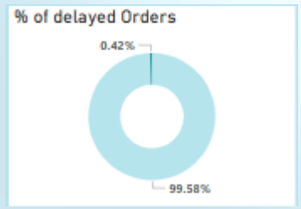
1. Gauge Chart: To set a target and see if our KPI fulfils the target.



2. Pie Charts

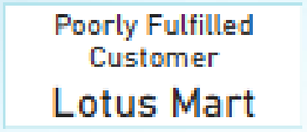


3. Donut Chart



4. Clustered Bar Graph

5. Card Visual



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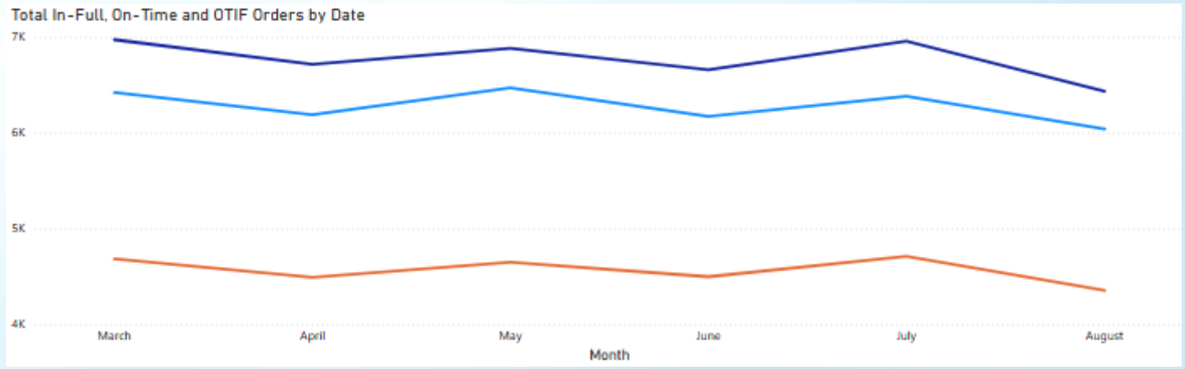
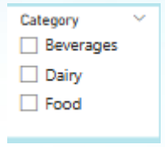
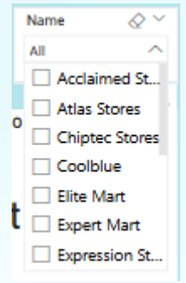
6. Line Charts



7. Slicers / Filters:
   a. Tile Slicers

   b. Dropdown filters (Multiple Selection)



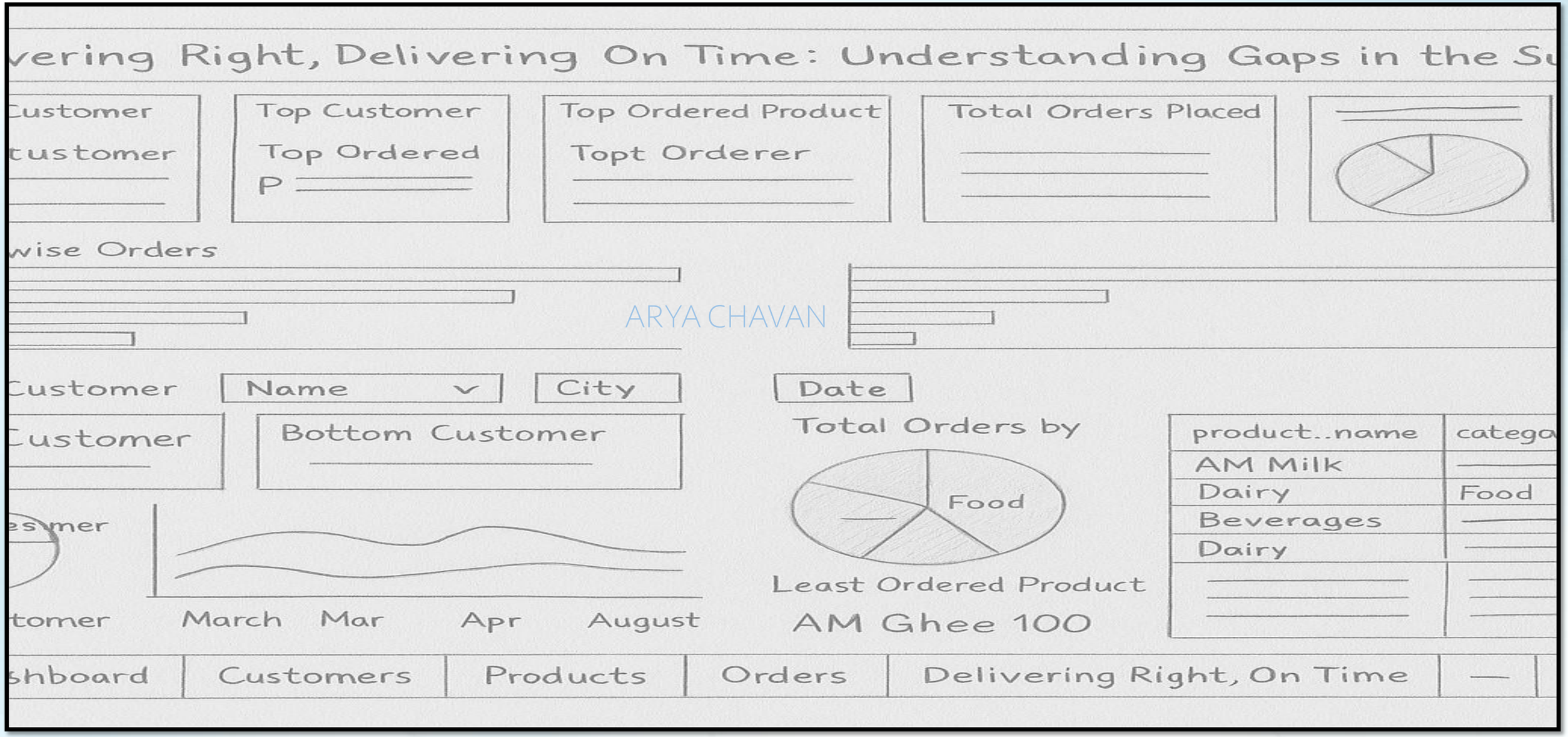


   a. List filter
   b. Table

customer_name	Total Orders	Sum of On Time In Full	Failed_OTIF_Orders	Sum of In Full	Incomplete_Orders	Sum of On Time	Late_Orders	Sum of Days De
Coolblue	3338	459	2879	1720	1618	895	2443	
Acclaimed Stores	4797	731	4066	2827	1970	1290	3507	
Lotus Mart	4870	782	4088	2926	1944	1253	3617	
Info Stores	3227	1403	1824	1712	1515	2683	544	
Elite Mart	3284	1474	1810	1732	1552	2783	501	
Sorefoz Mart	3281	1496	1785	1752	1529	2782	499	
Logic Stores	3257	2018	1239	2423	834	2716	541	
Total	**57096**	**27380**	**29716**	**37661**	**19435**	**40605**	**16491**	**2**

Methodology

Dashboard Building



Dashboard

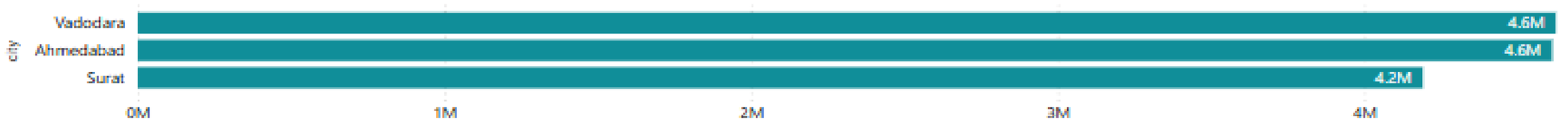
Delivering Right, Delivering On Time: Understanding Gaps in The Supply Chain Performance

DELIVERING RIGHT, DELIVERING ON TIME: Understanding Gaps in Our Supply Chain Performance

Best Served Customer	Top Ordered Product	Total Orders	Most Orders Placed On	Successful OTIF %
Propel Mart	AM Milk 250	57K	Tuesday	65.05

Poorly Fulfilled Customer	Least Ordered Product	Failed OTIF Orders	Max. Days for Delay	Failed OTIF %
Lotus Mart	AM Ghee 100	30K	3	34.95

City-wise Orders



Category based Orders

Date-wise Orders

INSIGHTS

1. Best Served Customer: Propel Mart
2. Poorly Fulfilled Customer: Lotus Mart

Objective: To know who are the top and bottom customers based on the number of products ordered.

3. Top Ordered Product: AM Milk 250
4. Least Ordered Product: AM Ghee 100

Objective: To know which are the top and least ordered products.

5. Total Orders: 57K

Objective: To know the total number of ordered products.

6. Failed OTIF Orders: 30K

Objective: To know the number of products that weren’t delivered either on-time, in-full or both.

7. Most Orders Placed On: Tuesday
8. Most Expected Days for Delivery: Thursday
9. Most Orders Delivered on : Weekends

Objective: To know the top Days on which Customers placed their orders, Customers expected their orders, and the days on which orders were actually delivered.

INSIGHTS

10. Maximum delayed days for delivery: 3

Objective: To understand how maximum days it took in general to deliver an order if delay happens.

11. Successful OTIF orders: 65.05 %

12. Failed OTIF orders: 31.33%

Objective: To know the percentage of OTIF orders based on their success rates.

Clustered Bar Chart:

13. City-wise Orders: Vadodara city has placed the highest number of orders (4624171 = 4.6M) followed by Ahmedabad (4612298 = 4.6M)

Objective: To get insight on which city has placed highest number of orders.

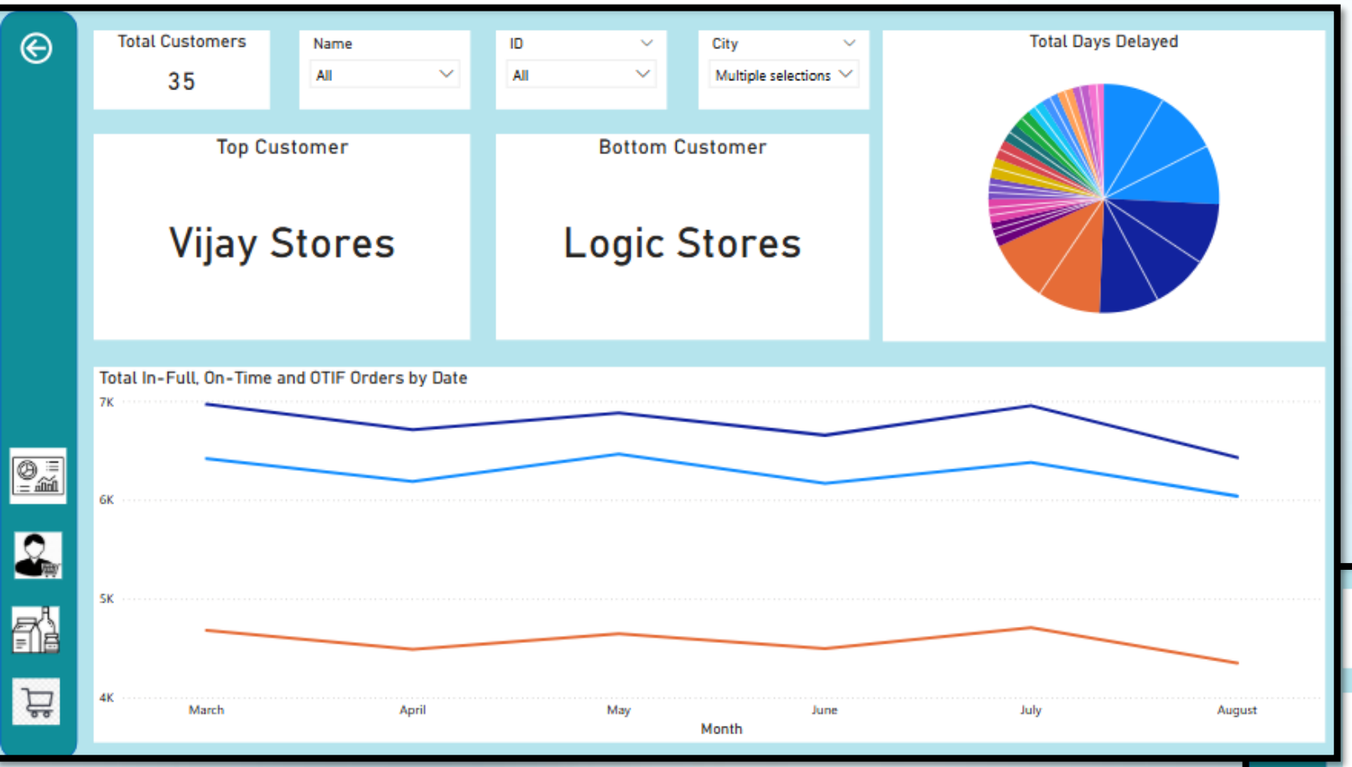
14. Category based Orders: Dairy category has the highest number of orders (10.6M)

Objective: To get insight on which category is in most demand.

15. Date-wise Orders: Most orders were placed in the month of MAY (2293881 = 2.30M)

Objective: To get insight seasonal demand for orders.

CUSTOMER INSIGHTS



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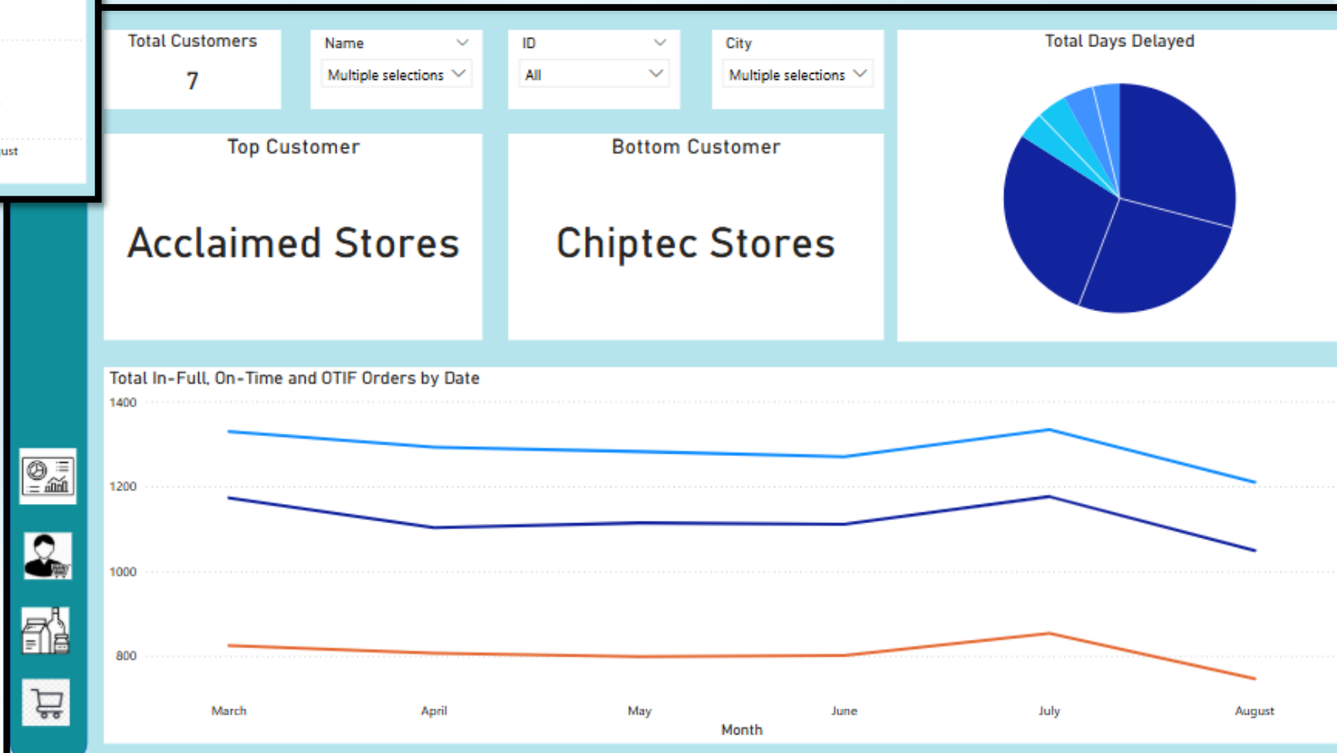


CUSTOMER INSIGHTS

Page is displayed based on the following filters:

a. Customer Name

b. Customer ID

c. Customer City

1. Total Customers: 35

Objective: To know the total customers based on their businesses and locations.

2. Total Days Delayed: Pie Chart

Objective: To know the total days of delay based on different customers.

3. Top Customer: Vijay Stores

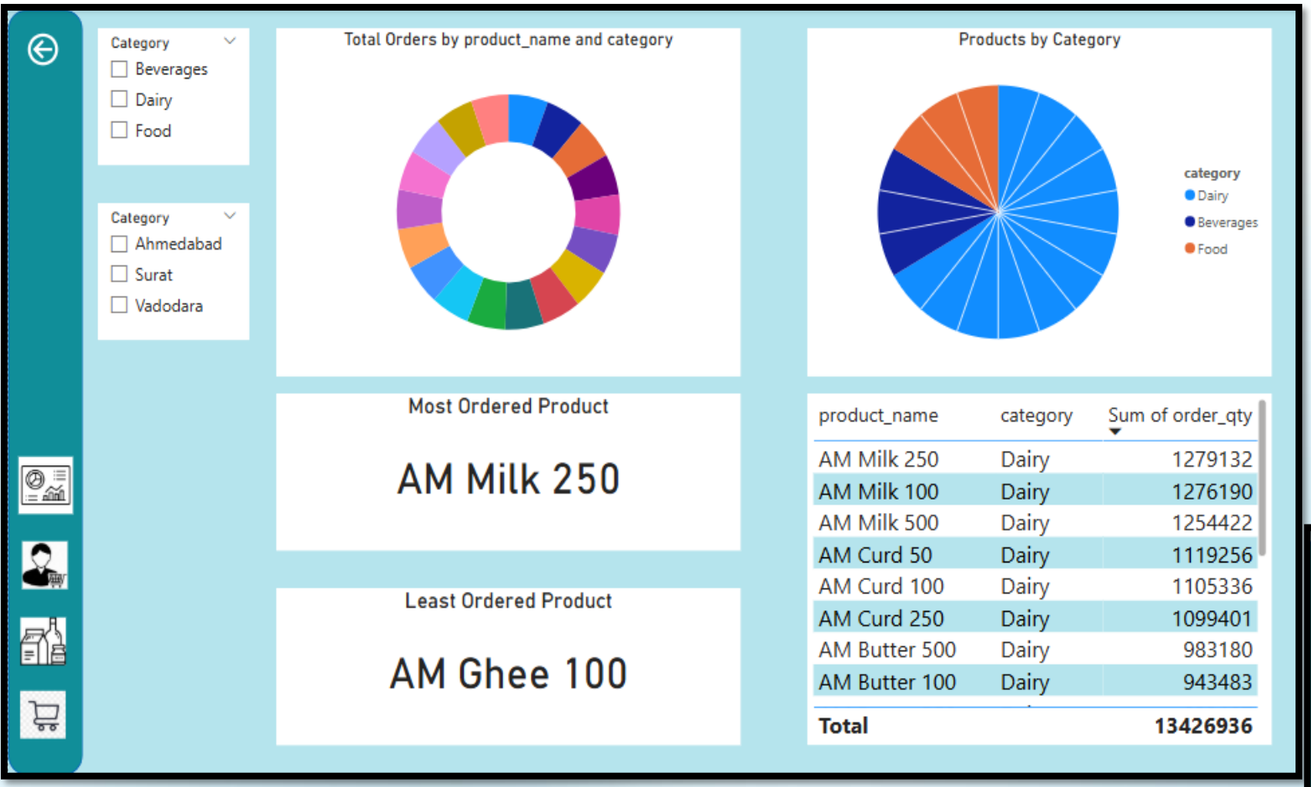
4. Bottom Customer: Logic Stores

Objective: To know who are the top and bottom customers based on the number of products ordered.

Line Chart:

Count of orders placed date-wise based on total In-Full, On-Time and OTIF Orders:

PRODUCT INSIGHTS



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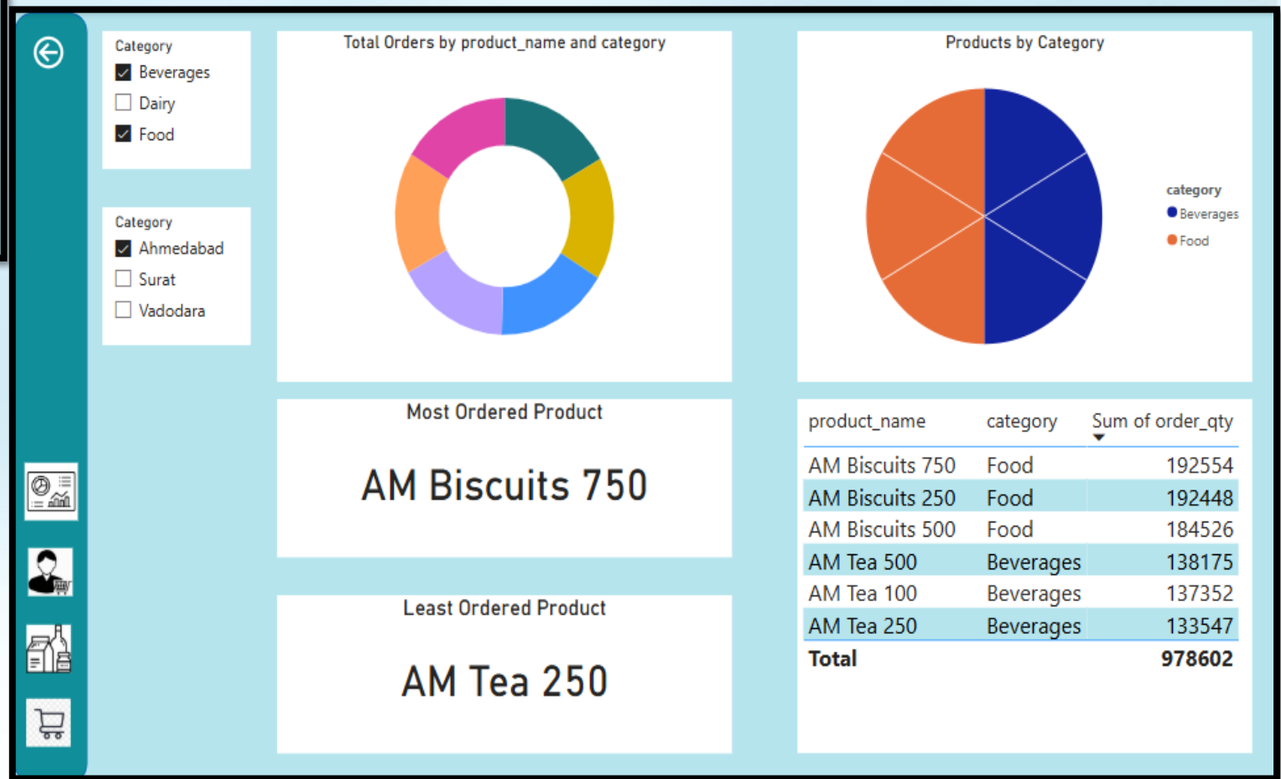

PRODUCT INSIGHTS

Page is displayed based on the following filters:

a. Product Category

b. City

1. Total Orders by Product Name and Category: Donut Chart

Objective: To know the total customers based on their businesses and locations.

2. Total Days Delayed: Pie Chart

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Objective: To know the total days of delay based on different customers.

3. Most Ordered Product: AM Milk 250

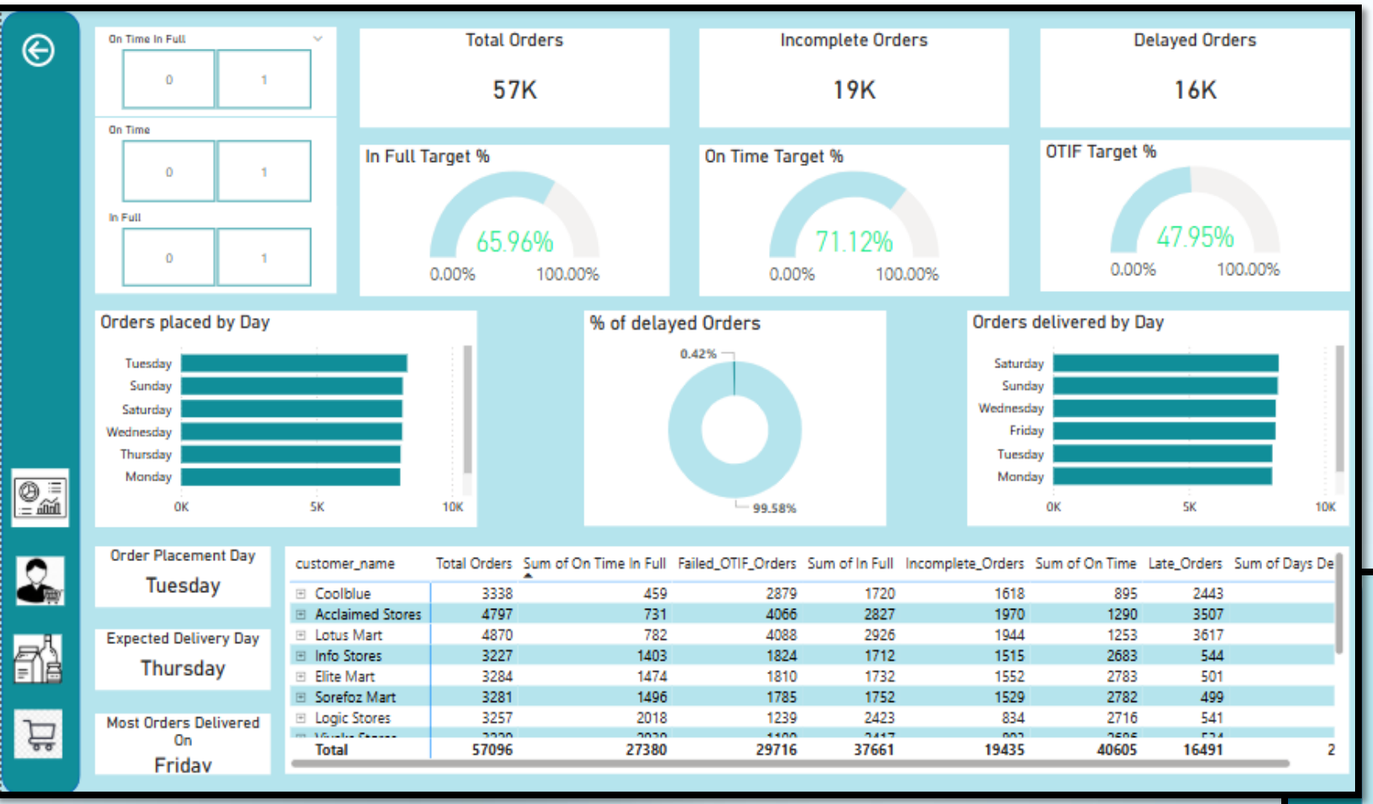
4. Least Ordered Product: AM Ghee 100

Objective: To know which are the top and least ordered products.

4. Table:

Objective: To display the products, their category and its total order quantity

ORDER INSIGHTS



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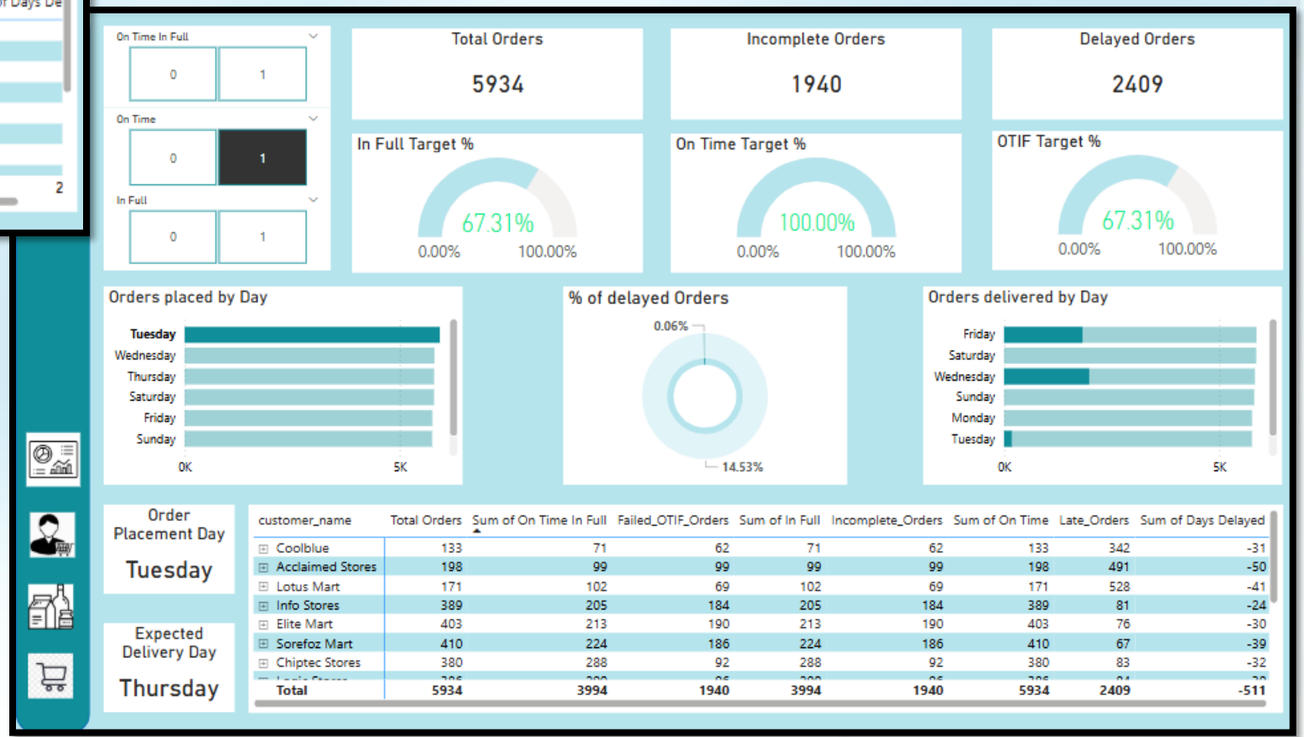

customer_name	Total Orders	Sum of On Time In Full	Failed_OTIF_Orders	Sum of In Full	Incomplete_Orders	Sum of On Time	Late_Orders	Sum of Days Delayed
Coolblue	133	71	62	71	62	133	342	-31
Acclaimed Stores	198	99	99	99	99	198	491	-50
Lotus Mart	171	102	69	102	69	171	528	-41
Info Stores	389	205	184	205	184	389	81	-24
Elite Mart	403	213	190	213	190	403	76	-30
Sorefoz Mart	410	224	186	224	186	410	67	-39
Chiptec Stores	380	288	92	288	92	380	83	-32
Total	**5934**	**3994**	**1940**	**3994**	**1940**	**5934**	**2409**	**-511**

ORDER INSIGHTS

Page is displayed based on the following filters:

a. OTIF Orders

b. On Time Orders

c. In Full Orders

Clustered Bar Charts

1. Orders Placed by Days: Tuesday had maximum orders placed throughout the week.
2. Orders Delivered by Days: Highest delivery was done on Weekends, especially on the Saturdays.

3. Expected Delivery Day: Thursday

Objective: This card shows what was the expected delivery day for the orders that were delayed.

4. % of Delayed Orders: Donut Chart ()

Objective: To check percentage of delayed orders out of all orders placed.

5. Table:

This table shows the customer name, total orders, and its respective successful and failed on-time, in-full, OTIF orders.

Solutions to Key Findings

Increase manpower and operations

Most orders are expected on Thursdays, also out of which most are delivered during weekend. Thus, the manpower should be either directed towards or increased for the weekdays

Focus

Increase the logistics and operations for the top-selling products, categories, and seasons, also focusing on the cities that place the highest orders.

Customer Retention

As Lotus Mart has consistently been poorly served (max. failed OTIF orders), focus on their retention by meeting their expectations and providing OTIF delivery of orders as this customer is mostly likely to churn.

Root-cause Analysis

As 30K orders fail to meet OTIF delivery, find the root cause for the same, whether it is the mode of transport, specific product or customer, weekend rush, or unrealistic customer expectations, etc. so as to improve te OTIF delivery %

Strategies for Improvement

Invest in Technology

Implementing advanced tracking and logistics management software can enhance visibility and streamline delivery processes for improved timing.

Build Strong Relationships

Developing solid relationships with suppliers and logistics providers fosters collaboration, ensuring better communication and reliability.

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Set Clear Expectations

Define delivery timelines clearly with customers and suppliers. Transparency allows for better planning and preparedness for unforeseen circumstances.

Regular Performance Reviews

Establish key performance indicators (KPIs) to assess delivery performance regularly. This helps identify areas for improvement and implement corrective actions.

Conclusion

1. A Data Visualization tool like Power BI helped to get insights on top customers, top products, order placement seasons, and locations, etc.

2. Important insights were received on the On-time, In-Full, and OTIF deliveries, such as the percentage of successful and failed deliveries.

3. Most orders that were able to achieve On-time delivery were incomplete. This can be due to the agreement of partial delivery of orders on the expected date, whereas the rest will be delivered later.

4. The logistics and management of operations need to be improved regarding manpower, mode of transport, availability of vehicles, number of inventories, and transparency between customer expectations and supplier commitments.

5. Targeted actions can improve OTIF from 65% to above industry benchmarks.

6. Continuous monitoring is key to achieving supply chain excellence.

7. Collecting customer feedback regarding delivery experiences can provide qualitative data on performance and will also help in understanding the setbacks, customer expectations and will help analyze the root causes for failed OTIF deliveries.

Thank You

- Arya Chavan