

Project Title: Atliq Mart Supply Chain Insights

Project Overview

Atliq Mart, a fast-growing FMCG manufacturer headquartered in Gujarat, India, currently operates in Ahmedabad, Surat, and Vadodara. With plans to expand into metro and tier-1 cities over the next two years, the company is focusing on strengthening its supply chain efficiency.

This project analyzes daily delivery data across customers, products and cities to identify gaps in the supply chain. By leveraging data-driven insights, the company can understand performance bottlenecks, improve delivery efficiency, and make informed decisions to support its expansion strategy.

Problem Statement

AtliQ Mart is currently facing a problem where a few key customers have not extended their annual contracts due to service issues. It is speculated that some of the essential products were either not delivered on time or not delivered in full over a continued period, which could have resulted in bad customer service. Management wants to fix this issue before expanding to other cities and requested their supply chain analytics team to track the 'On time' and 'In Full' delivery service level for all the customers daily basis so that they can respond swiftly to these issues.

The Supply Chain team decided to use a standard approach to measure the service level in which they will measure 'On-time delivery (OT) %', 'In-full delivery (IF) %', and 'OnTime in full (OTIF) %' of the customer orders daily basis against the target service level set for each customer.

Project Summary

This project analyzes delivery performance by tracking key supply chain metrics (OT %, IF %, OTIF %, LIFR %, VOFR %) and comparing them against defined targets. It enables interactive analysis across customers, products, and cities to uncover insights on service performance and order patterns.

Project Objective

This project focuses on measuring and analysing delivery performance across multiple dimensions to identify gaps and drive operational improvements.

1. Track Key Delivery Metrics

Monitor core indicators — **On-Time Delivery (OT %)**, **In-Full Delivery (IF %)**, and **On-Time In-Full Delivery (OTIF %)**, **Line Fill Rate (LIFR %)**, and **Volume Fill Rate (VOFR %)** — on a daily basis.

2. Evaluate Metrics Against Their Target for Customers

Assess **OT%**, **IF%**, **OTIF%**, **LIFR %** and **VOFR %** against defined customer-level targets to measure delivery performance.

3. Analyse Metrics Against Their Target for City

Break down **OT%**, **IF%**, and **OTIF%** performance at the city level, comparing results against respective targets to evaluate regional delivery efficiency.

4. Product-Wise Metric Check

Analyse product-wise contribution to **LIFR %** and **VOFR %**, identifying top and bottom performers to highlight product-specific fulfilment gaps.

Metric Understanding

1. Line Fill Rate (LIFR %)

Measures how many **order lines** were shipped out of the **total lines** ordered.

2. Volume Fill Rate (VOFR %)

Measures the **total quantity shipped** for a customer's order against the **total quantity ordered** within a given period.

3. In-Full Delivery (IF %)

Measured at the **order level**. An order is considered *In-Full* only if **all line items** are delivered in the requested quantity.

4. On-Time Delivery (OT %)

Measured at the **order level**. An order is *On-Time* only if **all line items** are delivered within the **agreed delivery time**.

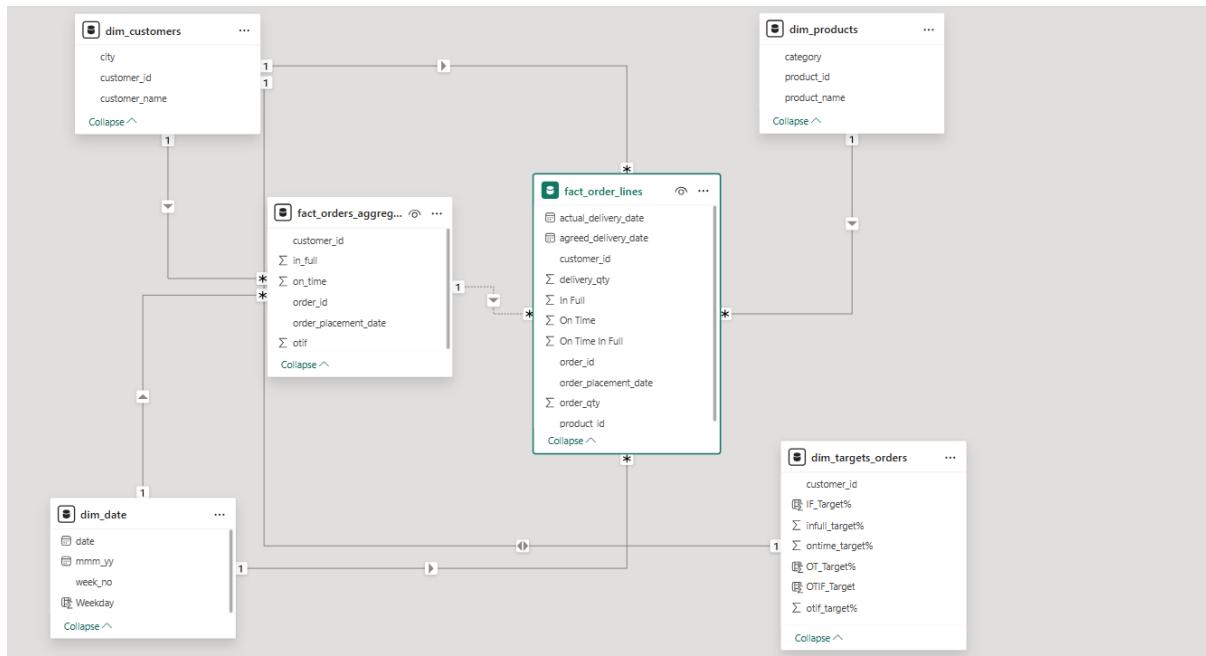
5. On-Time In-Full (OTIF %)

Measured at the **order level**. An order is *OTIF* only when **all line items** are delivered **In-Full (IF %)** and **On-Time (OT %)**.

Data Structure Overview

1 Data Source: CSV files

2 Data Model: Star schema consisting of 2 fact tables and 4-dimension tables



Tables

Fact Tables

- fact_order_lines** – Captures detailed order transactions at item level
 - order_id – Unique order identifier
 - order_placement_date – Date when the order was placed
 - customer_id – Unique ID of the customer
 - product_id – Unique ID of the product
 - order_qty – Quantity requested by customer
 - agreed_delivery_date – Date agreed for delivery
 - actual_delivery_date – Actual delivery date
 - delivered_qty – Quantity actually delivered
- fact_orders_aggregate** – Aggregated delivery performance at order level per customer
 - order_id – Unique order identifier
 - customer_id – Unique ID of the customer
 - order_placement_date – Order date
 - on_time – Delivery on-time flag (1 = Yes, 0 = No)
 - in_full – Delivery in-full flag (1 = Yes, 0 = No)
 - otif – On-Time In-Full flag (1 = Yes, 0 = No)

Dimension Tables

1. **dim_customers** – Customer details
 - o customer_id – Unique ID of customer
 - o customer_name – Customer name
 - o city – City of customer
2. **dim_products** – Product details
 - o product_id – Unique product ID
 - o product_name – Product name
 - o category – Product category
3. **dim_date** – Date hierarchy for analysis
 - o date – Daily date level
 - o mmm_yy – Monthly level (MMM-YY)
 - o week_no – Week number of the year
4. **dim_targets_orders** – Customer-level target metrics
 - o customer_id – Unique ID of customer
 - o ontime_target % – Target OT %
 - o infull_target % – Target IF %
 - o otif_target % – Target OTIF %

Tools & Skills

 **Tools:** Power BI

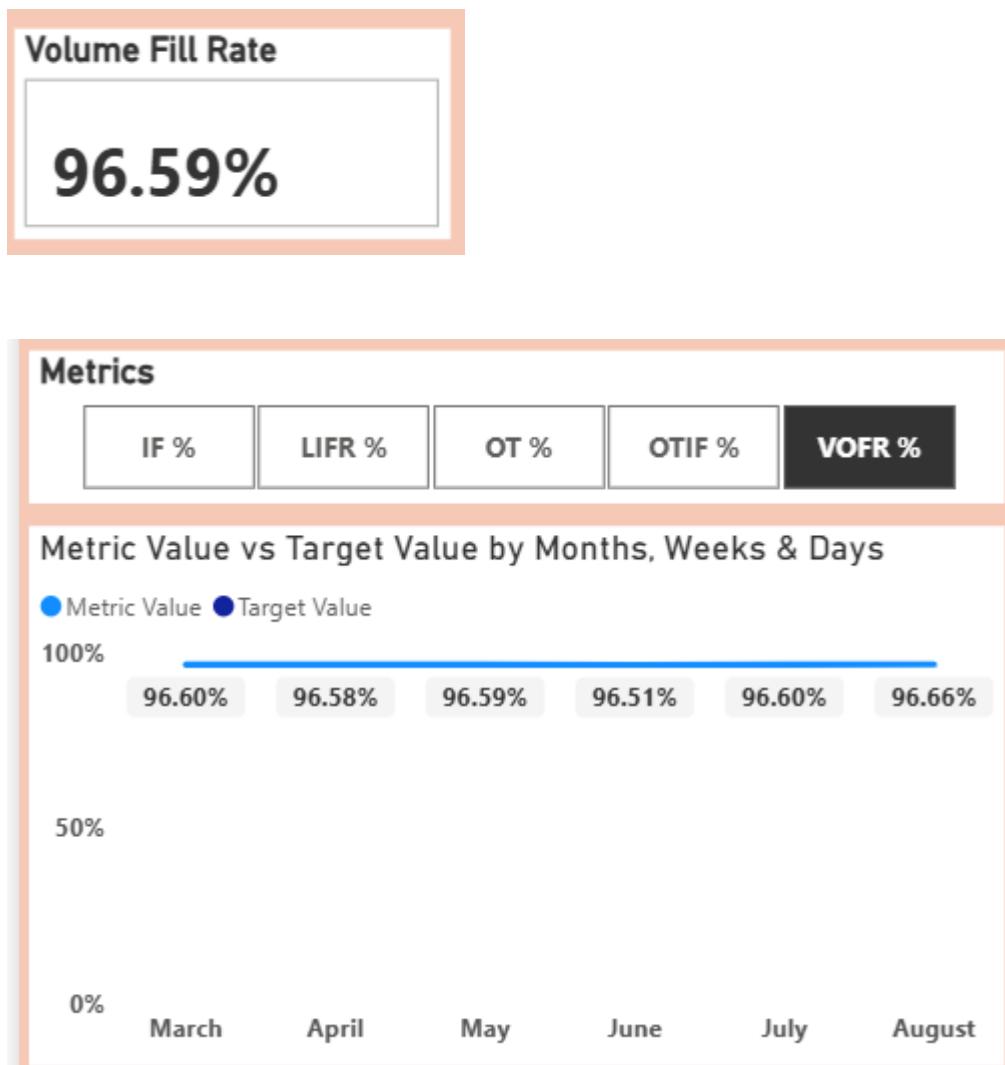
 **Skills:** Data Modelling, DAX, Visualization (KPIs, Tables, Matrix, Charts, Slicers)

Insights

Insights for Project Objective 1 Track Key Delivery Metrics:

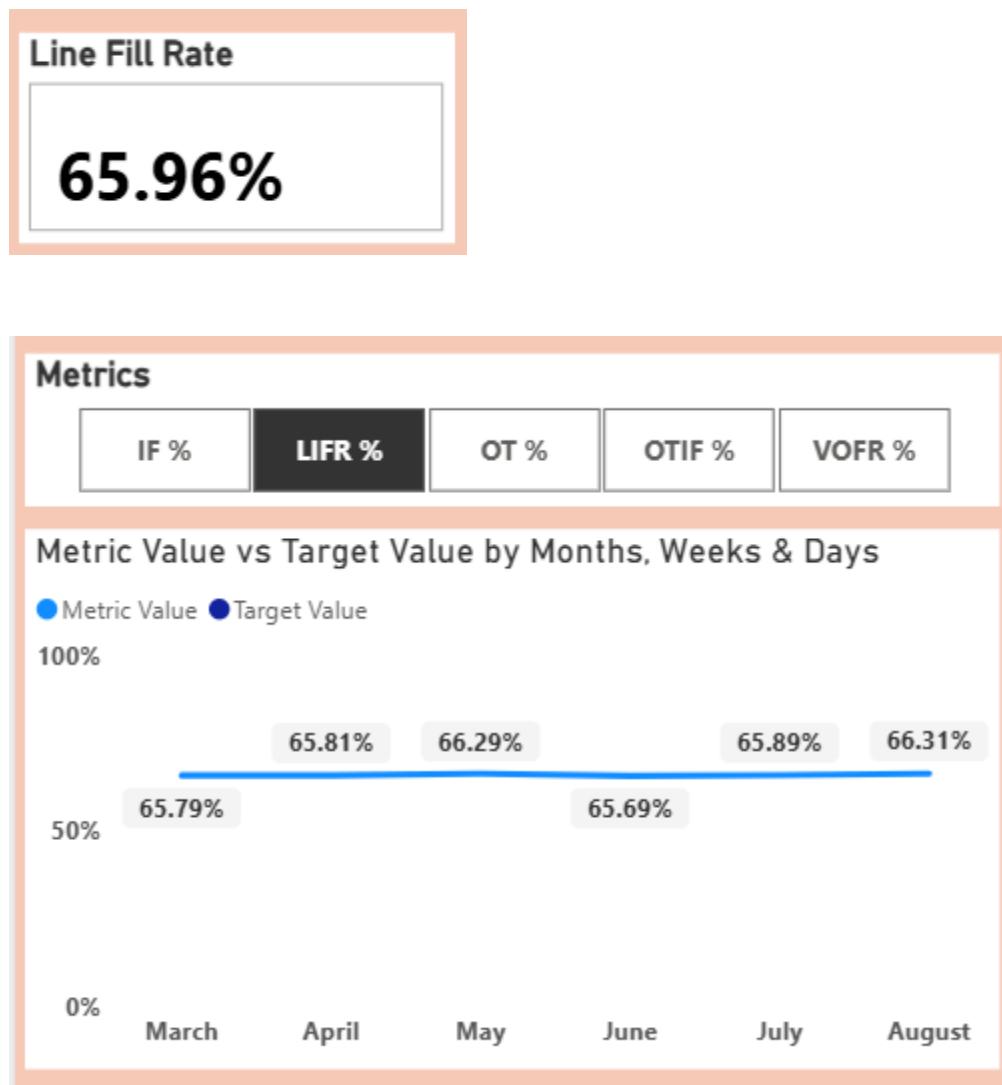
Metric Insights (Mar–Aug 2022)

1. Volume Fill Rate (VOFR%)



- **Performance:** Averaged **96.59%** across the period, with minimal month-to-month variation (**96.51%–96.66%**) but noticeable weekly dips (**96.07%–96.85%**).
- **Interpretation:** Overall stability indicates strong fulfilment consistency. Weekly volatility, however, points to intermittent operational or supply-side issues.
- **Key Takeaways for Improvement:**
 - Target VOFR $\geq 97\%$.
 - Implement **weekly performance alerts**.
 - Prioritize **inventory and forecasting fixes** for top-volume SKUs to strengthen LIFR% and IF%, thereby improving OTIF%.

2. Line Fill Rate (LIFR%)



- **Performance:** Averaged **65.96%** across the period. Monthly results ranged from **65.69% (June)** to **66.31% (August)**, showing stable performance with limited fluctuation. Weekly variation was more pronounced (**63.66% – 67.99%**).
- **Interpretation:** LIFR% improves when VOFR% increases (e.g., July 96.60% → 65.89% vs. August 96.66% → 66.31%), confirming dependency between the two metrics. Lower LIFR% may result from:
 - **Supplier issues:** late or short deliveries.
 - **System priorities:** ERP/WMS splitting orders into partial shipments to protect OT% at the expense of IF%.

- **Key Takeaways for Improvement:**
 - Improve **supplier reliability** and **inventory availability**.
 - Balance ERP/WMS rules to minimize trade-offs between OT% and IF%.

3. In-Full Delivery (IF%)

Daily In-Full % vs Target

52.78%

Goal: 76.51% (-31.02%)

Metrics

IF %

LIFR %

OT %

OTIF %

VOFR %

Metric Value vs Target Value by Months, Weeks & Days

● Metric Value ● Target Value

100%

76.51% 76.51% 76.51% 76.51% 76.51% 76.51%

52.56% 53.66% 52.48% 53.61%

52.34%

52.04%

0%

March

April

May

June

July

August

- **Performance:** Averaged **52.78%**, which is **23.7 percentage points below target (76.51%)**. Monthly variation was minor (**52.04%–53.66%**). Weekly values fluctuated more widely (**46.58%–55.40%**).
- **Interpretation:** Persistent underperformance highlights systemic fulfillment gaps. Contributing factors may include:
 - Inventory shortfalls.
 - Supplier delays or incomplete deliveries.

- ERP/WMS systems splitting shipments to prioritize OT%.
- **Key Takeaways for Improvement:**
 - Strengthen **supplier agreements** and **delivery terms**.
 - Optimize **inventory planning** to reduce shortfalls.
 - Re-evaluate **ERP/WMS logic** to reduce excessive order-splitting.

4. On-Time Delivery (OT%)

Daily On-Time % vs Target

59.03%

Goal: 86.09% (-31.43%)

Metrics

IF %

LIFR %

OT %

OTIF %

VOFR %

Metric Value vs Target Value by Months, Weeks & Days

● Metric Value ● Target Value

100%

86.09% 86.09% 86.09% 86.09% 86.09% 86.09%

50%

59.57% 59.32%

58.50%

58.88%

0%

March

April

May

June

July

August

- **Performance:** Averaged **59.03%**, which is **27 percentage points below target (86.09%)**. Monthly values were stable (**58.50%–59.57%**), while weekly values showed more variability (**57.35%–62.69%**).
- **Interpretation:** Consistently below target, with week-to-week fluctuations suggesting logistical and scheduling inefficiencies. Likely drivers:
 - Dispatch planning gaps.

- Transportation delays.
- Workforce scheduling issues.
- **Key Takeaways for Improvement:**
 - Enhance **dispatch planning**.
 - Strengthen **transportation management**.
 - Address **workforce scheduling** to reduce delays.

5. On-Time In-Full (OTIF%)

Daily OTIF % vs Target

29.02%

Goal: 65.91% (-55.97%)

Metrics

IF %

LIFR %

OT %

OTIF %

VOFR %

Metric Value vs Target Value by Months, Weeks & Days

● Metric Value ● Target Value

100%

50%

0%

65.91% 65.91% 65.91% 65.91% 65.91% 65.91%

28.87%

29.13%

29.35%

29.39%

28.67%

28.72%

March

April

May

June

July

August

- **Performance:** Averaged **29.02%**, which is **36.9 percentage points below target (65.91%)**. Monthly results were very stable (28.67%–29.39%), while weekly variation was more significant (27.10%–38.84%).

- **Interpretation:** Persistent underperformance reflects systemic issues across OT% and IF%. Occasional weekly spikes suggest temporary improvements, but not sustained progress. Likely causes include:
 - Inventory shortages.
 - Supplier unreliability.
 - ERP/WMS order-splitting.
 - Last-mile logistics inefficiencies.
- **Key Takeaways for Improvement:**
 - Focus on **end-to-end process improvements** across supply, inventory, and logistics.
 - Monitor **OT% and IF% drivers** closely, as both directly suppress OTIF%.
 - Establish **root-cause analysis** for weekly volatility and replicate best practices during peak weeks.

Insights for Project Objective 2 Evaluate Metrics Against Their Target for Customers:

Customers	OT Gap	IF Gap	OTIF Gap	LIFR %	VOFR %
Acclaimed Stores	-46.90%	-22.97%	-42.20%	58.93%	95.85%
Elite Mart	-18.55%	-35.06%	-42.13%	52.74%	95.29%
Lotus Mart	-49.22%	-21.98%	-41.66%	60.08%	96.01%
Coolblue	-47.87%	-26.27%	-40.75%	51.53%	95.08%
Info Stores	-21.06%	-29.84%	-39.98%	53.05%	95.24%
Vijay Stores	-16.89%	-31.02%	-39.72%	59.23%	95.87%
Sorefoz Mart	-14.33%	-32.81%	-36.61%	53.40%	95.33%
Expert Mart	-18.46%	-20.19%	-33.89%	75.48%	97.44%
Chiptec Stores	-17.38%	-20.65%	-33.27%	75.61%	97.58%
Viveks Stores	-18.39%	-20.93%	-33.06%	75.06%	97.57%
Rel Fresh	-15.68%	-20.64%	-31.49%	74.54%	97.43%
Expression Stores	-18.58%	-17.17%	-30.61%	75.28%	97.54%
Atlas Stores	-16.19%	-18.22%	-28.95%	75.48%	97.58%
Propel Mart	-13.03%	-19.60%	-27.74%	75.62%	97.70%
Logic Stores	-16.68%	-15.86%	-27.72%	74.39%	97.45%
Total	-27.05%	-23.73%	-36.89%	65.96%	96.59%

1. Overall Observations

- All customers fall below target for **OT %**, **IF %**, and **OTIF %**, with consistent gaps indicating systemic issues in timeliness and completeness of orders.
- **VOFR %** is relatively strong across customers (95%–98%), showing that most of the ordered volume is delivered.
- **LIFR %** shows greater variability (52%–76%), indicating challenges in delivering full line items per order.
- **Key insight:** while volume fulfilment is strong, on-time and in-full execution is the main challenge.

2. Top-Performing Customers

- **Propel Mart, Chiptec Stores, Atlas Stores, Viveks Stores, Expression Stores**
 - **VOFR %:** consistently 97.5%–97.9%
 - **LIFR %:** above 75.2%
- These customers lead in both VOFR % and LIFR %, making them the **benchmark group**.
- They also show smaller OT & IF Gaps, resulting in comparatively better OTIF % performance.

3. Bottom-Performing Customers

- **Coolblue, Elite Mart, Info Stores, Sorefoz Mart, Acclaimed Stores**
 - **VOFR %:** 95.1%–95.9% (lowest group)
 - **LIFR %:** 51.5%–58.9% (lowest group)
- These customers consistently appear at the bottom across multiple metrics.
- **Elite Mart & Sorefoz Mart** also show the largest IF Gaps (-32% to -35%) and OTIF Gaps (-39% to -42%), making them **critical focus accounts**.

4. Metric-Wise Insights

a) IF % (In-Full Delivery)

- Best performers: Logic Stores, Expression Stores, Atlas Stores, Propel Mart, Expert Mart
 - Gap ranges from -15.9% to -20.2%
- Worst performers: Elite Mart, Sorefoz Mart, Vijay Stores, Info Stores, Coolblue
 - Gap ranges from -26.3% to -35.1%

- Bottom customers also align with lower VOFR % (<96%) and low LIFR % (<55%), showing a strong link between poor IF % and weaker fulfillment metrics.

b) OT % (On-Time Delivery)

- Best performers: Propel Mart, Sorefoz Mart, Rel Fresh, Atlas Stores, **Logic Stores**
 - Gaps between -13.0% and -16.7%
- Worst performers: Lotus Mart, Coolblue, Acclaimed Stores, Info Stores, Expression Stores
 - Gaps between -18.6% and -49.2%

c) OTIF % (On-Time In-Full)

- Best performers: Logic Stores, Propel Mart, Atlas Stores, Expression Stores, Rel Fresh
 - Gaps between -27.7% and -31.5%
- Worst performers: Acclaimed Stores, Elite Mart, Lotus Mart, Coolblue, Info Stores
 - Gaps between -40.0% and -42.2%

5. Key Takeaways & Improvement

- **Systemic Issue:** Every customer is below OT, IF, and OTIF targets → process efficiency must improve.
- **On-Time Delivery (OT %):** Gaps are largely due to **delayed deliveries against agreed dates** → stronger order scheduling and proactive dispatch planning are required.
- **Inventory & Order Management:** Bottom customers (Elite Mart, Sorefoz Mart, Coolblue, Info Stores, Acclaimed) require **tighter inventory planning, ERP checks, and improved delivery/transport efficiency**.
- **Benchmarking:** Top customers (Propel Mart, Atlas, Expression, Chiptec) should be used as **best-practice benchmarks** for LIFR & VOFR performance.
- **Linked Improvement:** Improving **VOFR % + LIFR %** directly supports higher IF %, which in turn boosts OT % and ultimately OTIF %.

Insights for Project Objective 3 Analyse Metrics Against Their Target for City:

City	OTIF %	OTIF Target	IF %	IF Target	OT %	OT Target
Ahmedabad	29.33%	66.50%	54.20%	77.33%	58.16%	85.83%
Surat	30.07%	66.36%	52.55%	76.91%	61.21%	86.27%
Vadodara	27.78%	64.92%	51.56%	75.33%	57.98%	86.17%
Total	29.02%	65.91%	52.78%	76.51%	59.03%	86.09%

In-Full Delivery (IF %)

- Ahmedabad: **54.20%** vs. target **77.33%**
- Surat: **52.55%** vs. target **76.91%**
- Vadodara: **51.56%** vs. target **75.33%**

Reason: Lower IF % across all cities is primarily due to weaker **VOFR %** and **LIFR %**, indicating incomplete order fulfilment.

Key Takeaways & Improvements:

- **Strengthen inventory management and supplier coordination.**
- Ensure SKU availability for higher order completeness.

On-Time Delivery (OT %)

- Ahmedabad: **58.16%** vs. target **85.83%**
- Surat: **61.21%** vs. target **86.27%**
- Vadodara: **57.98%** vs. target **86.17%**

Reason: Lower OT % across cities is linked to weaker **LIFR %**, meaning not all order lines were ready for dispatch on the agreed delivery date.

Key Takeaways & Improvements:

- Improve **dispatch planning and workforce readiness.**
- Strengthen **delivery management efficiency and proactive tracking.**

On-Time In-Full (OTIF %)

- Ahmedabad: **29.33%** vs. target **66.50%**

- Surat: **30.07%** vs. target **66.36%**
- Vadodara: **27.78%** vs. target **64.92%**

Reason: OTIF % performance is directly impacted by gaps in VOFR %, LIFR %, IF %, and OT %, leading to incomplete and delayed deliveries.

Key Takeaways & Improvements:

- Focus on integrated improvements across supplier readiness, inventory, and delivery execution.
- Addressing IF % and OT % drivers will uplift OTIF %.

Insights for Project Objective 4 Product-Wise Metric Check:

Products	LIFR %	VOFR %
AM Biscuits 750	68.05%	96.85%
AM Milk 500	67.51%	96.71%
AM Curd 250	67.05%	96.72%
AM Curd 100	66.73%	96.62%
AM Ghee 150	66.72%	96.69%
AM Butter 100	66.66%	96.59%
AM Tea 500	66.14%	96.52%
AM Biscuits 500	66.10%	96.49%
AM Milk 250	65.91%	96.61%
AM Ghee 100	65.75%	96.59%
AM Curd 50	65.55%	96.62%
AM Milk 100	65.55%	96.54%
AM Tea 100	65.32%	96.59%
AM Ghee 250	65.25%	96.53%
AM Butter 500	65.19%	96.46%
AM Tea 250	65.16%	96.52%
AM Biscuits 250	65.16%	96.58%
AM Butter 250	63.52%	96.36%
Total	65.96%	96.59%

Top Products Performance

- **VOFR%:** Highest performing products include AM Biscuits 750, AM Curd 250, AM Milk 500, AM Ghee 150, and AM Curd 100, with VOFR% ranging from **96.62% to 96.85%**.
- **LIFR%:** Leading products include AM Biscuits 750, AM Milk 500, AM Curd 250, AM Curd 100, and AM Ghee 150, with LIFR% ranging from **66.72% to 68.05%**.
- **Observation:** Higher VOFR% aligns with higher LIFR%, indicating that when more volume is fulfilled, more line items are successfully delivered.

Bottom Products Performance

- **VOFR%:** Lowest performing products include AM Butter 250, AM Butter 500, AM Biscuits 500, AM Tea 500, and AM Tea 250, with VOFR% ranging from **96.52% to 96.36%**.
- **LIFR%:** Products with the lowest fill rate include AM Butter 250, AM Biscuits 250, AM Tea 250, AM Butter 500, and AM Ghee 250, with LIFR% ranging from **63.52% to 65.25%**.
- **Observation:** Common underperforming products (AM Butter 250, AM Butter 500, AM Tea 250) show that lower VOFR% leads to lower LIFR%, highlighting fulfilment and delivery gaps.

Key Takeaways for Improvement

- Strengthen **supplier-side delivery terms** to ensure timely product availability.
- Enhance **inventory management** aligned with order demand.
- Improve **delivery-side management** to achieve consistent on-time performance.