

# Project Report

## Feast India Company - Food Truck

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**Course: MSIS 2621 - Business Intelligence and Data Warehousing**

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# Phase 1

## Business Analysis

### 1. Business Analysis

Business Analysis is the practice of enabling change in an organizational context, by defining needs and recommending solutions that deliver value to stakeholders. In this phase, we identified and articulated the business needs and devised solutions that facilitated these business requirements. This phase consists of identifying the business scenario, lead and lag measures and developing a swim lane diagram that notes key stakeholders of the business.

### 2. Domain: Street Food Industry

The food truck management system is a POS (Point of Sale) transaction designed for the Street Food Service Industry. A food truck is a large motorized vehicle (such as a van) or trailer, equipped to cook, prepare, serve, and/or sell food. Like any other POS system, the food truck management system assists in capturing transactions and managing inventory effectively. This regulates certain business measures that help run daily processes more efficiently. A setup may include both software and hardware, such as a cash register, computer/iPad and receipt printer.

### 3. Business Overview

Our team chose to do our project on the Feast India Company Food Truck. This food truck provides Indian Fast Food and has two locations, as of now - Milpitas & Sunnyvale in California. The food truck brand identified the lack of places where people can relish good Indian dishes that were made with great joy. The food truck's menu includes a range of Indian snacks which has authentic Indian essence and flavors. The brand's vision is to be a one-stop place for customers' cravings for wholesome Indian taste. The Feast India Company Food truck is located at two places where a large number of IT professionals work and its customer base comprises Indian, Asians, and Native.

### 4. Business Scenario

Milani, Mousmi, Pratik, Kirtana, and Jhaanvi went for a hike and wanted lunch around 11:30 AM. They found The Feast India Company food truck in Sunnyvale and decided to try it. The food truck offers a variety of Misal Pav and Vada Pav options along with beverages. The group ordered Butter Vada Pav, Cheese Butter Vada Pav, Vada Misal Pav, Jain Masala Pav, and Szechwan Vada Pav, all at medium spice level. The cashier asked for the mode of payment, and options included Credit/Debit Cards, Cash, Venmo, and Zelle. Pratik and Kirtana paid through the card, and the rest of the group paid through Venmo. Once their order was ready, they took the food from the counter and ate it in their car. The food was delicious, and they plan to recommend it to their friends as well as give a great rating as feedback. They may consider visiting the other location as well.

## 5. Leading Measures

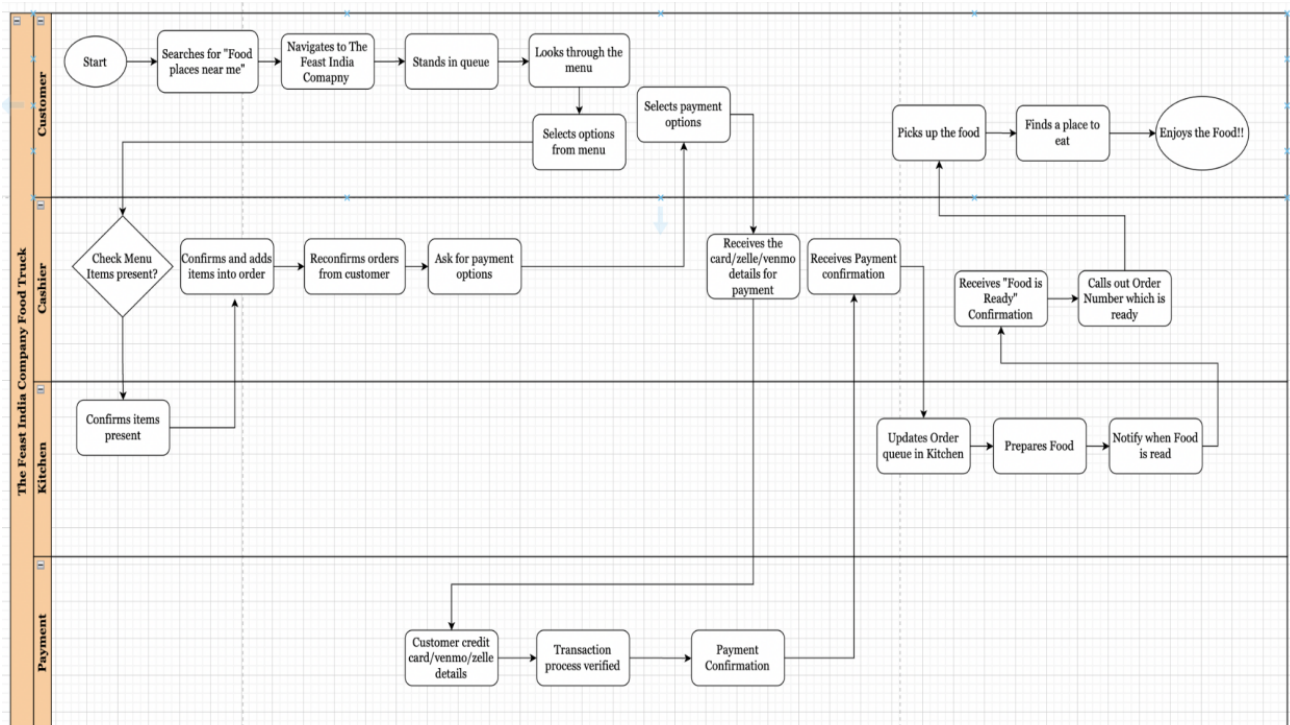
- Number of Orders per Day, Week
- Average Order Value
- Speed of order turnovers (From Order placement to final bill settlement)
- Location based metrics - Volume of orders by location, Outperforming timings by location
- Reviews & feedback - in-person and online platforms like Yelp

## 6. Lagging Measures

- Total Revenue Per Quarter, Annual
- Lowest popular Menu Items (Can be replaced)
- Which Menu items brought the most revenue?
- Which Menu items were the most popular?
- Food wastage
- Sentiment Analysis (based on reviews and feedback)

## 7. Swim Lane Diagram

We created a Swim Lane Diagram to break down the entire ordering process. This helped us understand the data collection points and breakdown of the business.



### A. Description of the Swim Lane Diagram

The customer searches for various options of restaurants/food trucks “near me”. The customer finds Feast India Company and navigates to the food truck location. Now the customer stands in the queue and looks through the menu. The customer chooses items listed on the menu to place the order. The cashier checks with the kitchen if the item is still available. After the kitchen confirms the items available, the cashier checks with the customer for the final order and asks for the mode of payment which could be cas/card/venmo/zelle. The customer chooses a mode and gives the necessary information for the payment. Once the transaction is processed, the customer and cashier receives payment confirmation. The cashier then updates the order queue in the kitchen where they prepare the food and notifies when the food is ready. Cashier calls out the order number and the customer picks up the food from the cashier and enjoys his/her meal.

### B. Scenario Details/ Parsing Scenario to Identify key Information

**Stakeholders:** Customers, Cashier, Kitchen Staff, Staff/Employees, Managers, Suppliers

**Products:** Menu items like Vada Pav, Misal Pav, Chaas, Gulab Jamun

**Infrastructure:** Computer, Receipt Printer, Truck (food is prepared and orders are taken), Kitchen equipment,

#### Interpreting the Tasks and the Goals:

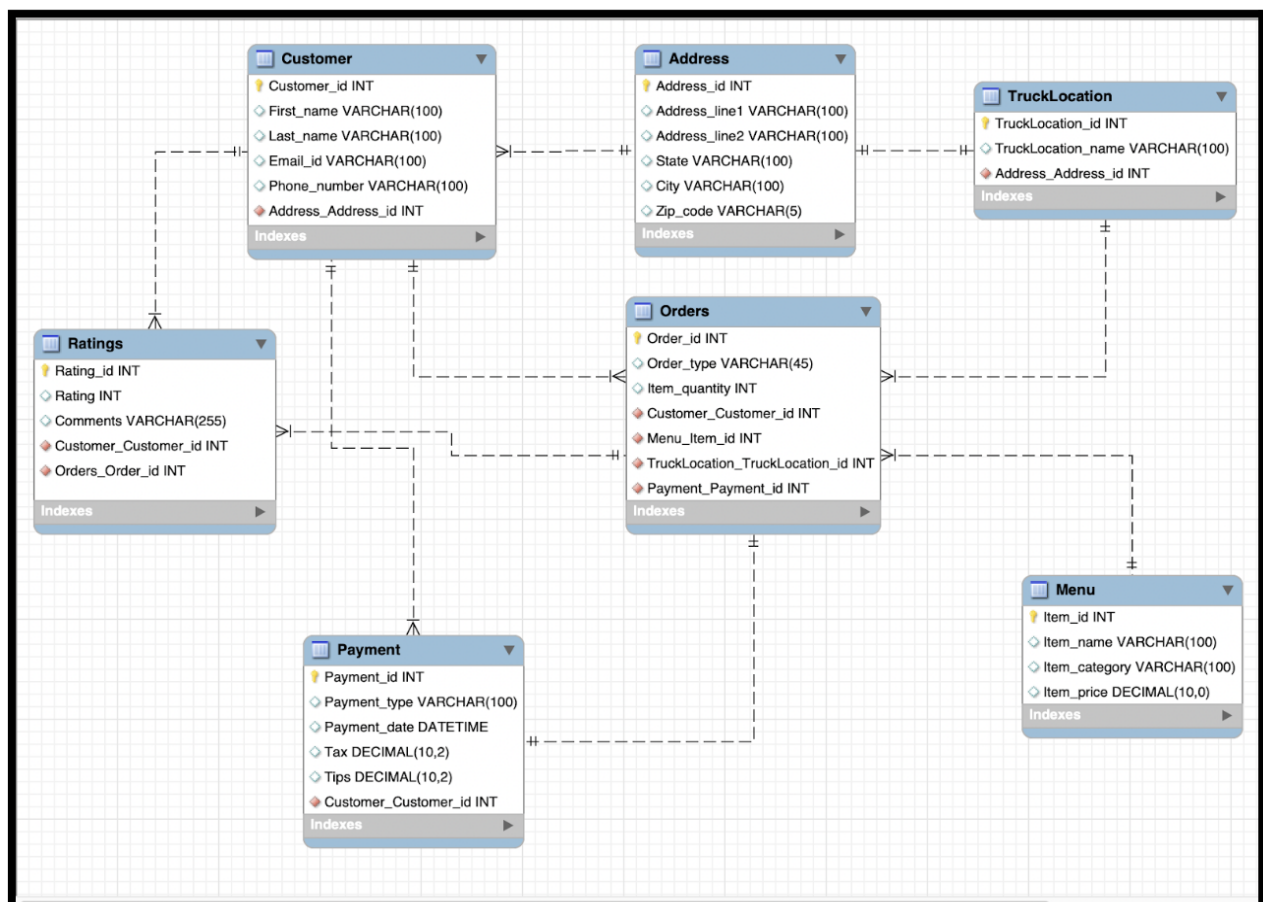
	Customer	Front-end staff: Cashier	Back-end staff: Chef/cleaning staff
<b>Tasks</b>	Navigate to the food truck Look through the menu Order food Choose a mode of Payment Pay the cashier for the order Wait for food to be prepared Collect the food from cashier	Welcomes and greets the customer Hands over the menu Takes order from customer Checks for menu items if available Confirms with customer for final order Collects payment information Updates the order queue in Kitchen Hands over prepared food to the customer	Takes order from cashier Updates to the cashier if the menu item is available Prepares the food Hands over the food to the cashier Cleans the kitchen after all orders
<b>Goals</b>	Buy and eat food	Help customer with end to end process of placing an order	Prepare the food and clean the kitchen

## Phase 2

### Data Modeling

#### 1. OLTP Schema

OLTP uses a fully normalized schema for database consistency. The response time of the OLTP system is short. It strictly performs only the predefined operations on a small number of records. OLTP stores the records of the last few days or a week. Using what we learnt from the Swim Lane Diagram, we constructed the following OLTP Schema.



#### 2. Data Warehouse

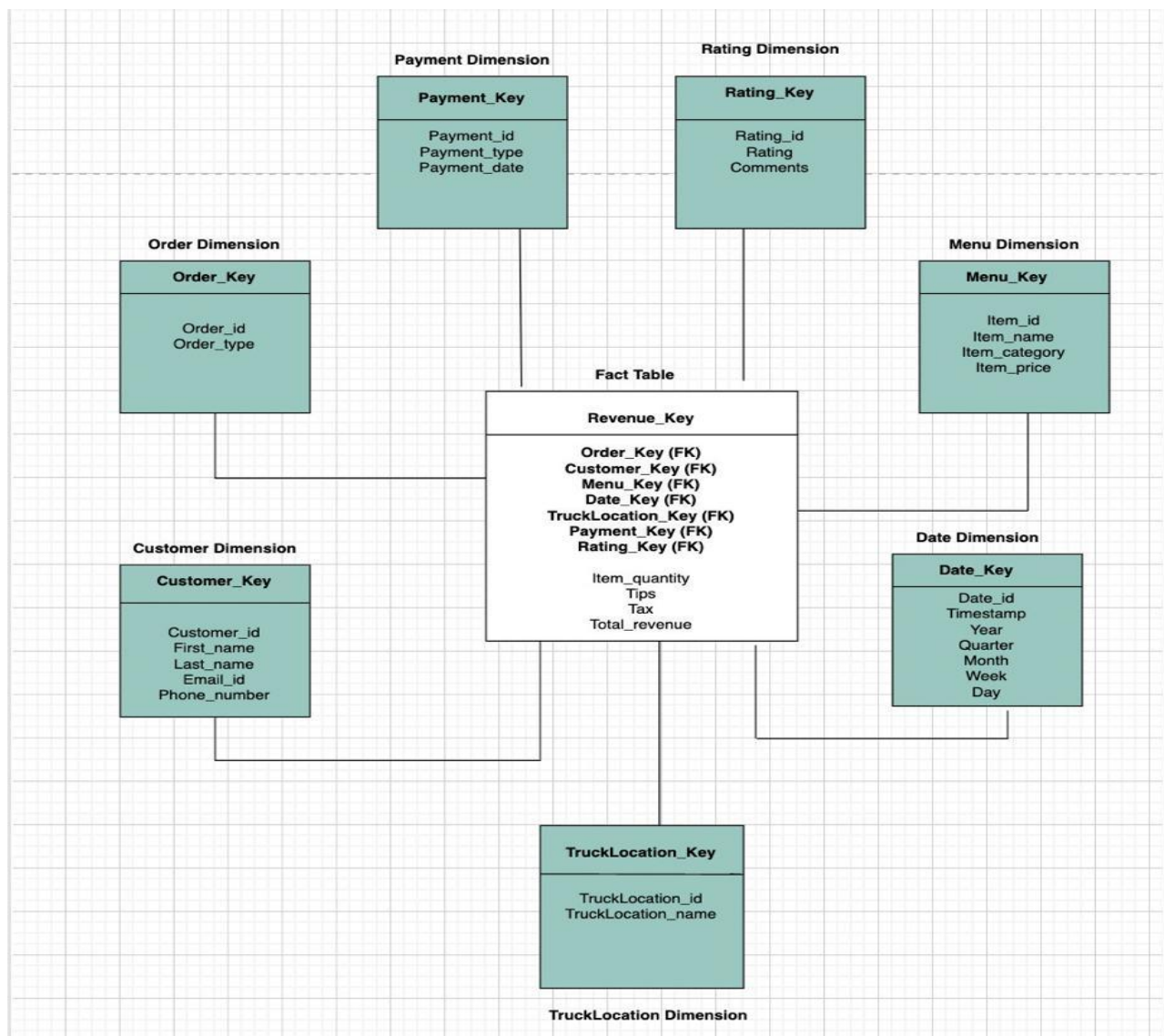
Based on the OLTP Schema and our leading and lagging measures that we were interested in building, we constructed the OLAP Star Schema consisting of seven dimensions and one fact table.

The dimension table is a table or entity in a star, snowflake, or starflake schema that stores details about the facts. The seven Dimension tables are:

- a. Customer Dimension

- b. Order Dimension
- c. Menu Dimension
- d. Payment Dimension
- e. Rating Dimension
- f. Truck Location Dimension
- g. Date Dimension

The fact table is an entity in a star or snowflake schema that stores measures that measure the business, such as sales, cost of goods, or profit. Fact tables and entities aggregate measures, or the numerical data of a business. Here the fact table has various keys of the dimension tables and details of the cost of menu item and order value per order.





## Phase 3

### ETL Implementation

#### Data Sources for Implementation

1. CSV
2. Excel
3. MySQL Database

#### Data Sets

The datasets were initially generated manually. Few data such as order, ratings and payments were generated using Yelp and generatedata.com.

#### Websites

1. Generatedata.com
2. Yelp

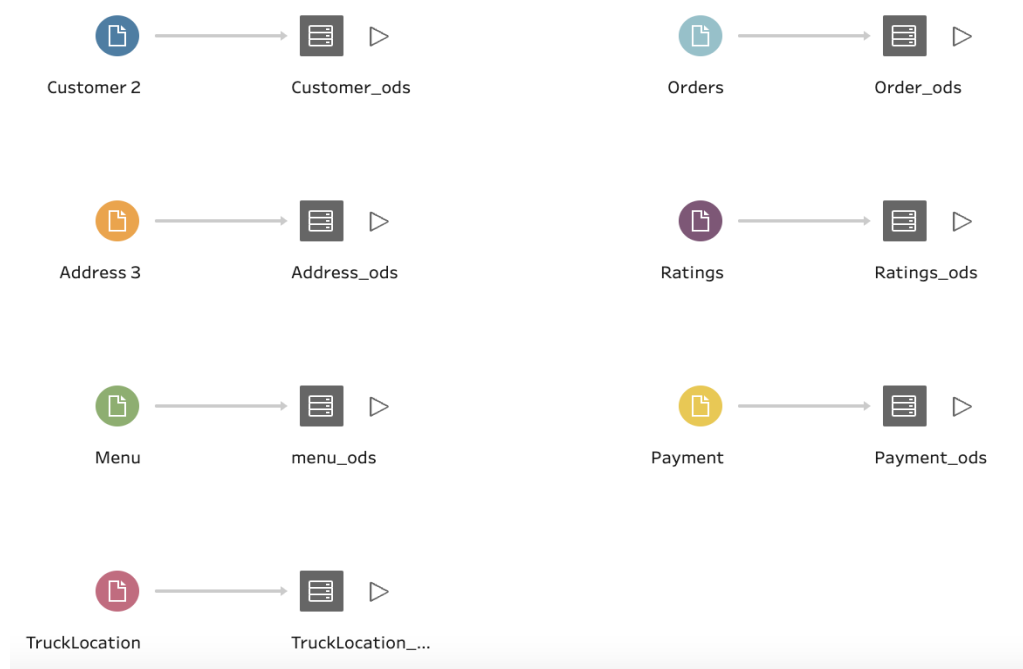
#### Tables of Generated Data

1. Customer
2. Address
3. Menu
4. Truck Location
5. Orders
6. Ratings
7. Payment

### Part 1: Transferring OLTP Data into the ODS Tables

First we transferred OLTP (Online Transaction Processing) data into the ODS (Operational Data Store) database for setup using Tableau Prep Builder. This is the phase where we extract data from different data sources like Excel and CSV.





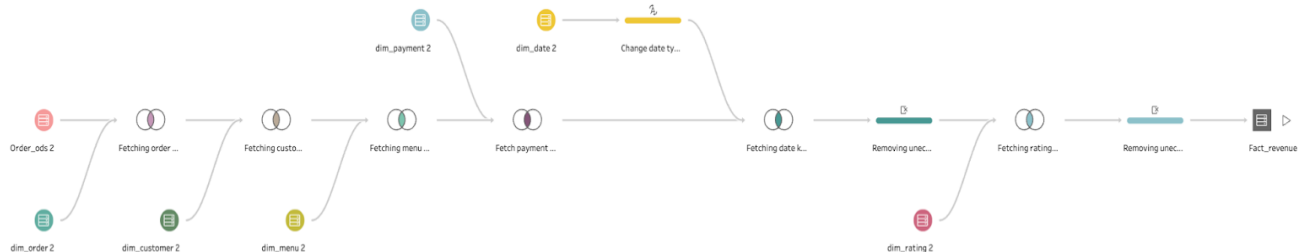
## Part 2: Transferring ODS Tables into Dimension Tables

Here, we generate various keys for each table and load the tables into dimension tables. We also cleaned up fields that were necessary to arrive at our star schema / data warehouse setup.



## Part 3: Load fact Table by using the Dimension Tables in Warehouse Schema

Finally, we joined all the ods tables in accordance with our star schema, cleaning the data if necessary and added everything into our fact table. This setup enabled us to use Tableau Desktop to create a Dashboard and analyze the business.



## MySQL Result of Loaded Fact Table

1 • `SELECT * FROM FeastIndia_wh.Fact_revenue;`

100% 1:1

Result Grid Filter Rows: Search Export:

	Order_id	item_quant...	menu_item_id	trucklocation...	order_key	Customer_id	customer_key	Item_id	Item_price	menu_key	Payment_id	Payment_key	DATE_SK
▶	660	5	15	2	660	77	77	15	4.45	15	660	660	20220602
	357	5	8	2	357	25	25	8	7.78	8	357	357	20220603
	155	5	14	1	155	3	3	14	5.45	14	155	155	20220603
	457	7	3	1	457	72	72	3	12.98	3	457	457	20220605
	299	4	11	2	299	44	44	11	7.78	11	299	299	20220605
	963	5	5	2	963	30	30	5	12.98	5	963	963	20220606
	963	5	5	2	963	30	30	5	12.98	5	963	963	20220606
	772	5	4	2	772	33	33	4	12.98	4	772	772	20220606
	772	5	4	2	772	33	33	4	12.98	4	772	772	20220606
	196	5	6	2	196	46	46	6	6.98	6	196	196	20220606
	196	5	6	2	196	46	46	6	6.98	6	196	196	20220606
	174	5	15	2	174	58	58	15	4.45	15	174	174	20220606
	174	5	15	2	174	58	58	15	4.45	15	174	174	20220606

Result Grid Form Editor Field Types

## Phase 4

### Tableau Implementation

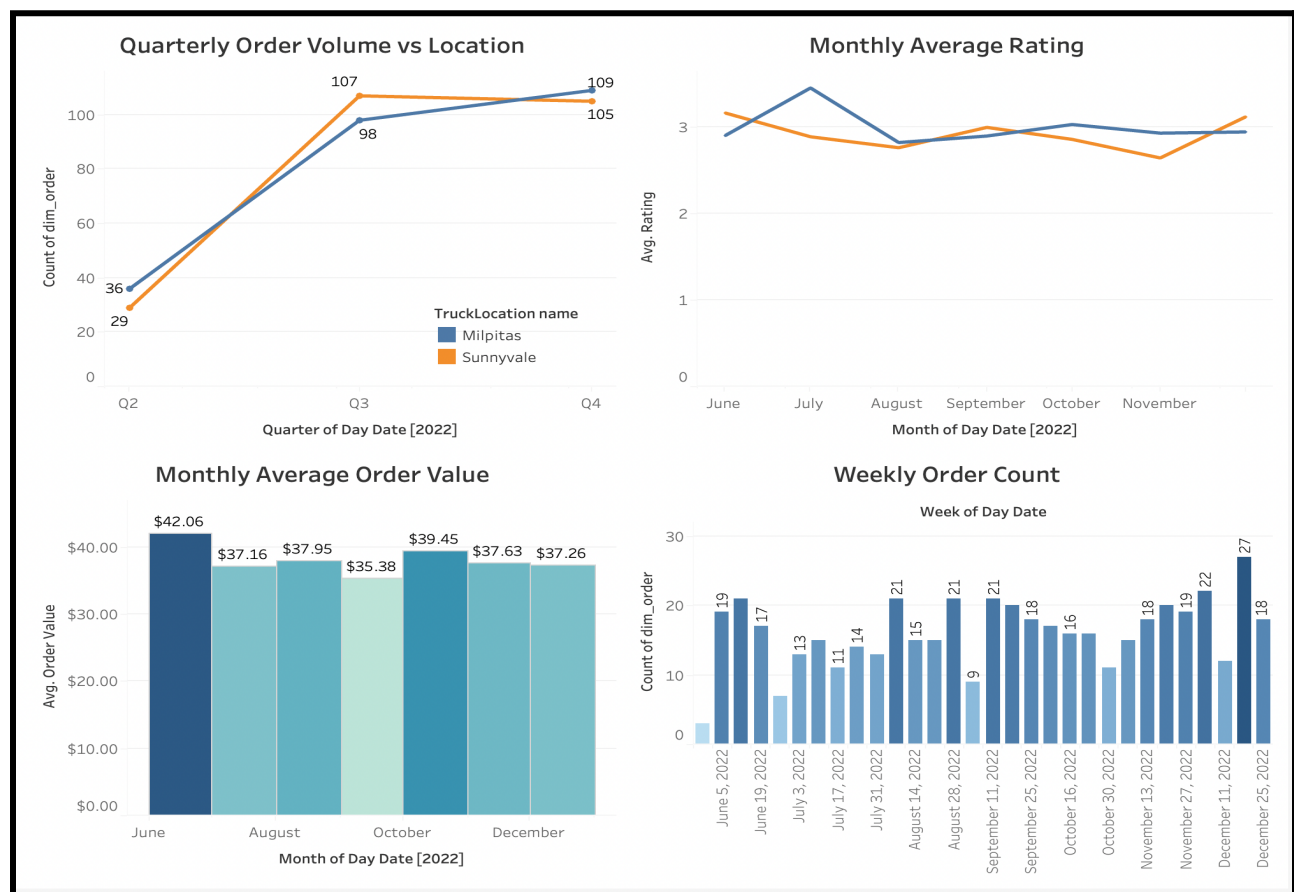
The Tableau file export has 2 types of analytics - Descriptive and Predictive Analysis.

**Descriptive analytics** is the process of parsing historical data to better understand the changes that occur in a business. Using a range of historic data and benchmarking, decision-makers obtain a holistic view of performance and trends on which to base business strategy.

**Predictive analytics** is a branch of advanced analytics that makes predictions about future outcomes using historical data combined with statistical modeling, data mining techniques and machine learning. Businesses employ predictive analytics to find patterns in this data to identify risks and opportunities.

#### 1. Dashboard - Descriptive Analytics 1

1. Finding Quarterly Order Volume for each location
2. Average Monthly Rating for each location
3. Average Total Order Value - Monthly
4. Weekly Order Count



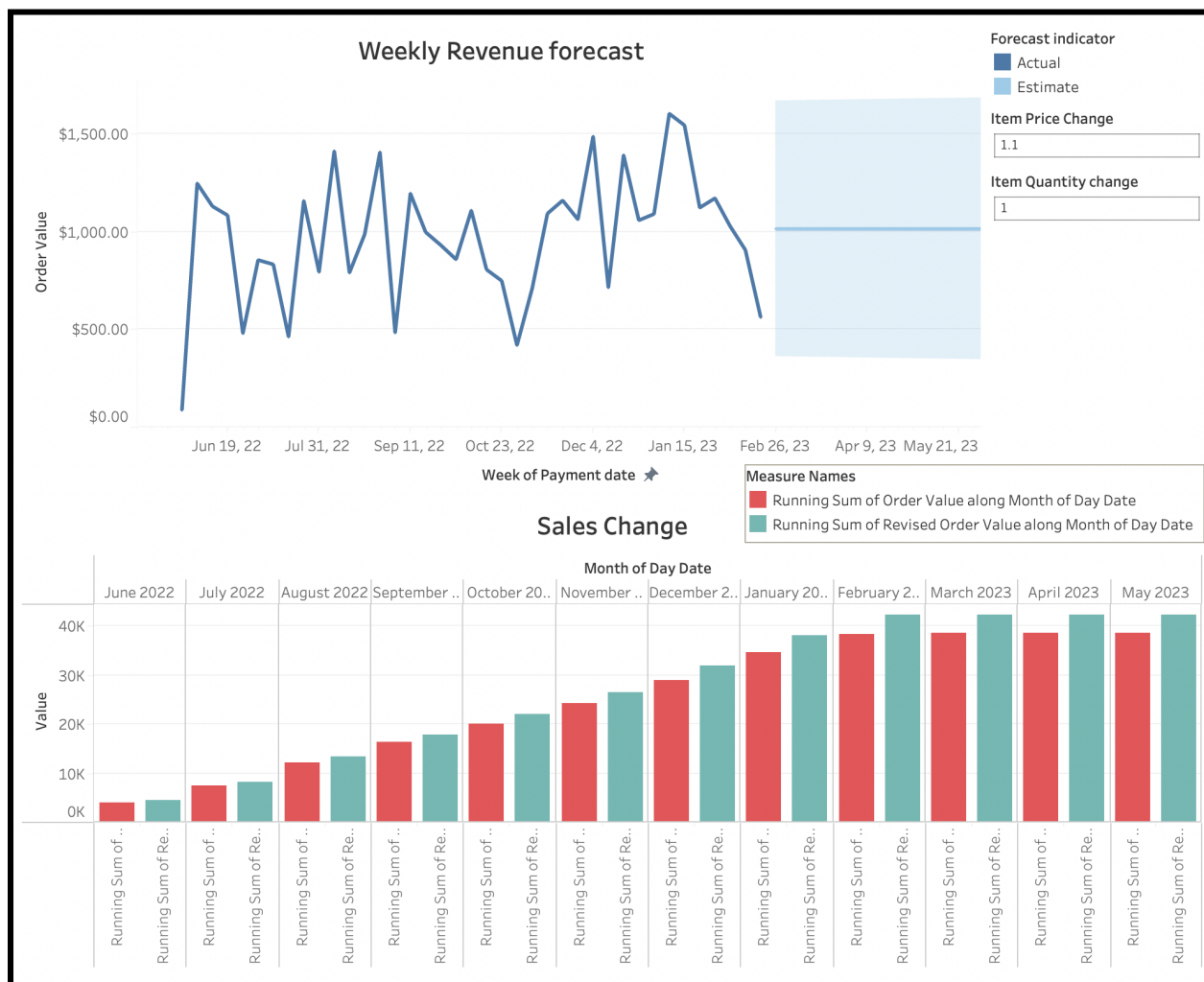
## 2. Dashboard - Descriptive Analytics 2

1. Popular Item (Monthly and Quarterly) - Date Parameter
2. Total Revenue (Monthly and Quarterly) - Date Parameter



### 3. Dashboard - Predictive Analytics and Forecasting

1. Revenue Forecast (Weekly)
2. Sales Change (Monthly) - Measuring Sales change by using Parameter for change in item price and item quantity



## **Conclusions**

1. The descriptive dashboard provides valuable insights on location-specific order volume, performance, and menu optimization, enabling the business to make data-driven decisions to enhance customer experience, increase revenue, and optimize resources.
2. The second descriptive dashboard helps identify the popular items, enabling the business to optimize its menu and allows selecting the date range and filtering popular items to see total revenue and revenue breakdown for the selected item.
3. Due to a limited dataset, we cannot get an accurate forecast, however we can still get an average, min and high values for our revenue to plan our business and growth strategies. (\$1000 avg weekly order value)
4. Predictive analytics helps us to further enhance our strategy building and business decisions to drive growth.

## **Key Learnings**

1. Understanding data and business requirements are really important for accurate metrics to track our business.
2. After the transformation, the validation of data at the source as well as the destination is really important.
3. A dashboard should be created keeping the user in mind and should be user-friendly.
4. Planned Analytics - lead and lag measures, at the beginning serve as a guide, but with actual data and user in mind we can create more relevant visualizations.

## **Challenges**

1. We had to truncate and load our table multiple times because of minor issues.
2. We had limited (1000 rows) sample data for analytics, forecasting and visualizations.