IST 722 Project Fudgemart & Fudgeflix

Order Fulfillment – Group 2

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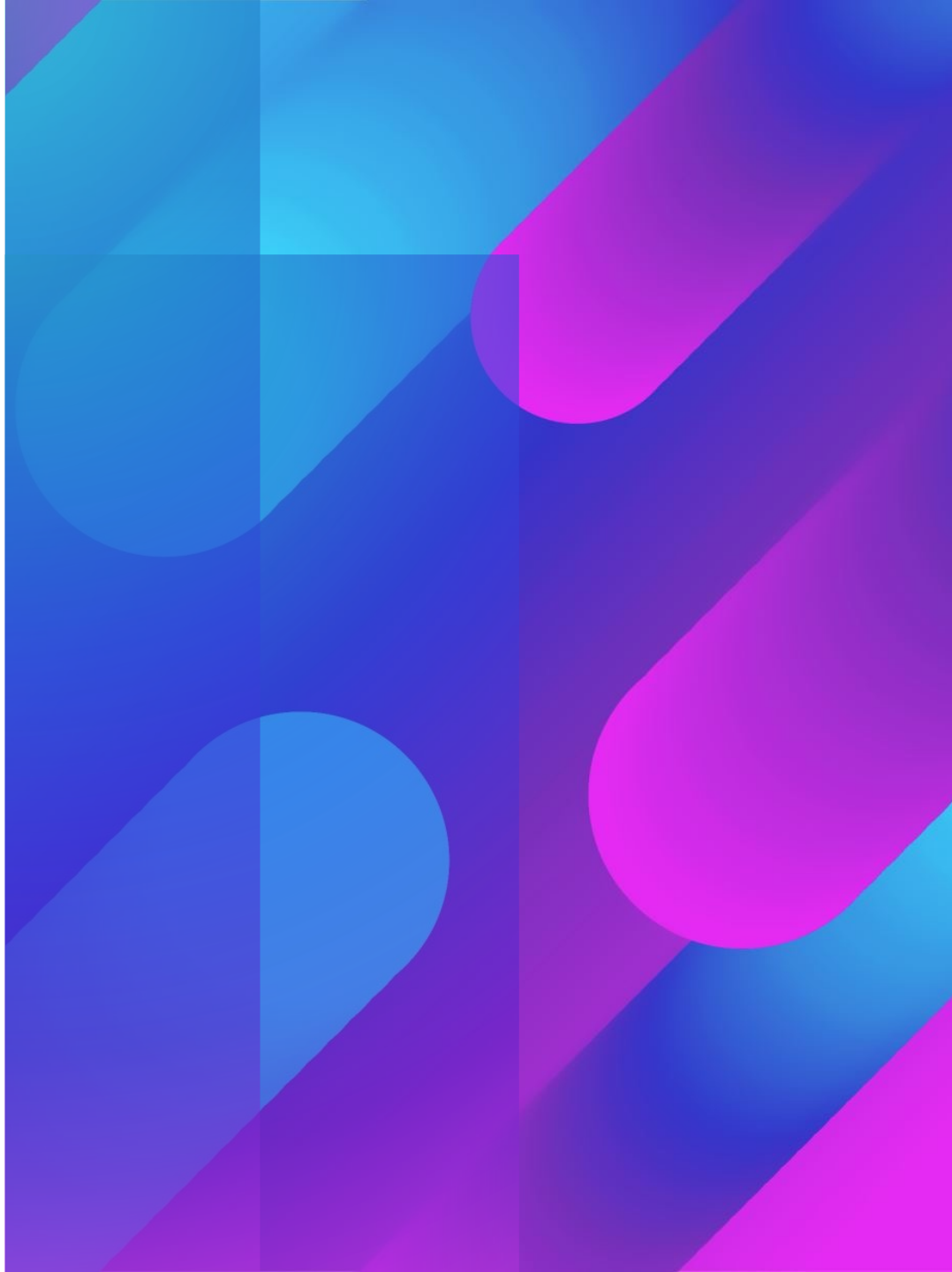


Project Objective

Create a Data Warehouse

Create a Business Intelligence Platform

Bring Fudgeflix and Fudgemart to a single source for the business

Derive insights for the Fulfillment Team

Business Objectives

Successfully guide merger of Fudgeflix and Fudgemart data sources to ensure minimal loss in business processes throughout the transition.

Ensure all aspects of the business remain operational from sales to inventory to order fulfillment and everything in-between.

Business Processes

Order Fulfillment

Sales

Inventory

Customer Service

Sales Coverage

Project Goal:

The business should be able to perform all their analytical needs regarding order fulfillment for Fudgmart and Fudgeflix from a single source. This will include the ability to analyze lead times of products by day of week, month of the year, department, and where the product was shipped to.

Dimensional Modeling

Bus Matrix

Business Process	Fact Table	Fact Grain Type	Granularity	Facts
Order Fulfillment	fact_order_fulfillment	Accumulating Snapshot	One row per order	order_date, shipped_date, carrier, order_to_ship_lag
Sales	fact_sales	Transaction	One row per sale	product_retail_price, order_qty, ab_billed_amount
Inventory	fact_inventory	Periodic Snapshot	One row per product	qty, return_date
Customer Service	fact_customer_service	Periodic Snapshot	One row per review	rating, review_date
Sales Region	fact_sales_region	Periodic Snapshot	One row per location	city, state, zip, product_retail_price, ab_billed_amount

Detailed Dimensional Model (part 2)

Example Fact Table

Column Name	Display Name	Description	Example Values	SCD Type	ETL Rules
ProductKey	ProductKey	Key to DimProduct	1, 2, 3		Key lookup from DimProduct.ProductKey
CustomerKey	CustomerKey	Key to DimCustomer	1, 2, 3		Key lookup from DimCustomer.CustomerKey
CarrierID	CarrierID	Business key from source system (aka natural key)	1, 2, 3...	key	
OrderDateKey	OrderDateKey	Key to DimDate	20120108		Key lookup from DimDate.DateKey
ShippedDateKey	ShippedDateKey	Key to DimDate	20120108		Key lookup from DimDate.DateKey
OrderID	OrderID	The natural key for the fact table, which represents an order that is being fulfilled	1, 2, 3		
OrderToShipLagInDays	OrderToShipLagInDays	shipped_date - order_date	1, 22, 45		

Detailed Dimensional Model (part 2)

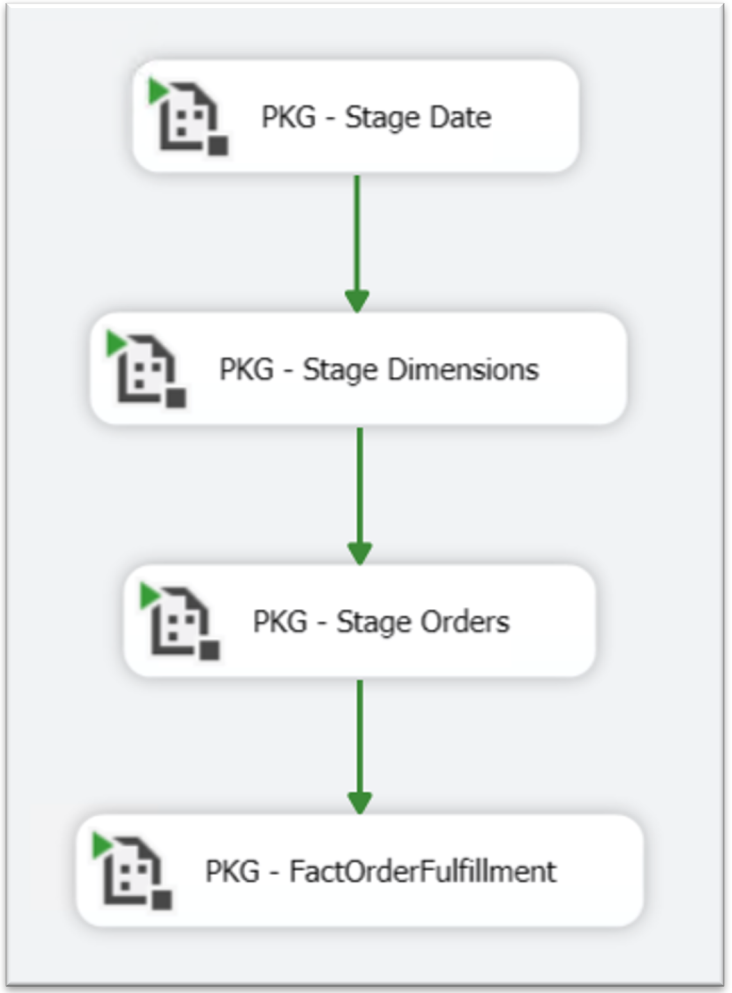
Example Dimension

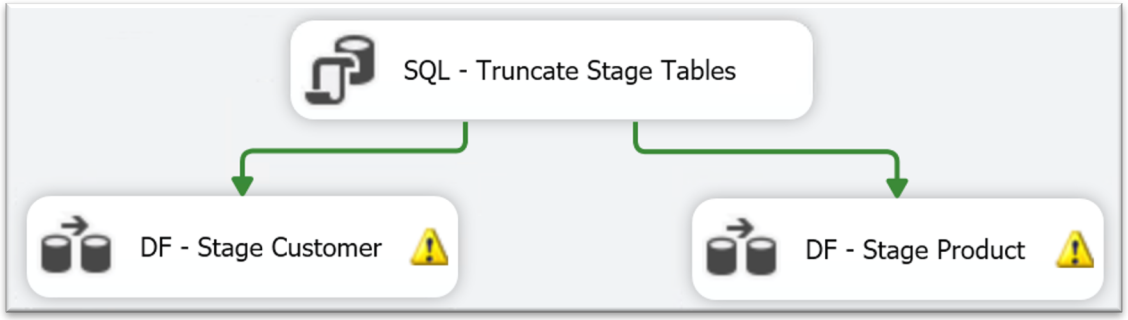
Column Name	Display Name	Description	Unknown Member	Example Values	SCD Type	Display Folder	ETL Rules
ProductKey	ProductKey	Surrogate primary key	-1	1, 2, 3...	key		
ProductID	ProductID	Business key from source system (aka natural key)	-1	1, 2, 3...	key		
product_department	product_department	Department for product	Unk Department	Electronics	2		
product_name	product_name	Name of product	Unk Product	DVD Player	2		
RowIsCurrent	Row Is Current	Is this the current row for this member (Y/N)?	1	TRUE, FALSE	n/a	Exclude from cube	Standard SCD-2
RowStartDate	Row Start Date	When did this row become valid for this member?	1/1/00	1/24/11	n/a	Exclude from cube	Standard SCD-2
RowEndDate	Row End Date	When did this row become invalid? (12/31/9999 if current row)	12/31/99	1/14/1998, 12/31/9999	n/a	Exclude from cube	Standard SCD-2
RowChangeReason	Row Change Reason	Why did the row change last?	N/A		n/a	Exclude from cube	Standard SCD-2

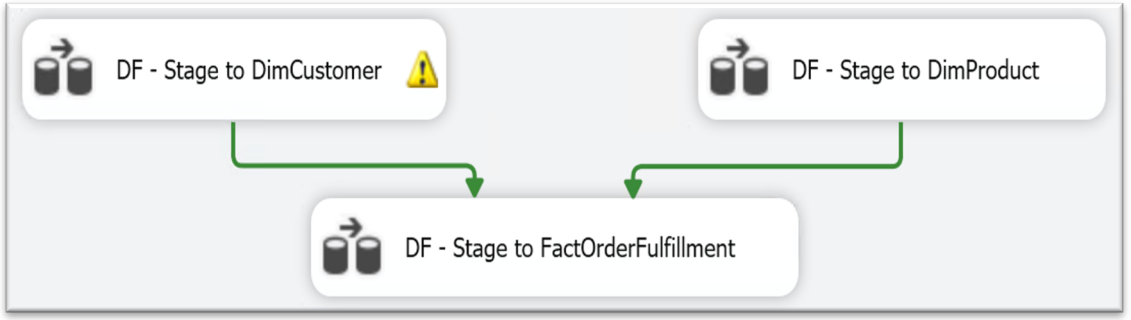
ETL Process

ETL Process Overview:

- The ETL process consisted of loading Date, Product, Customer, and Orders into the staging database.
- During staging, data conversion and derived columns fixed any differences in data type between companies.
  - Example: truncating the Zip Code from Fudgemart to the standard 10-character length and increasing Fudgeflix to 10 characters.
- Linking primary keys to the correct Fudgemart and Fudgeflix databases was integral to this process for mapping the correct orders to the appropriate customers and products.



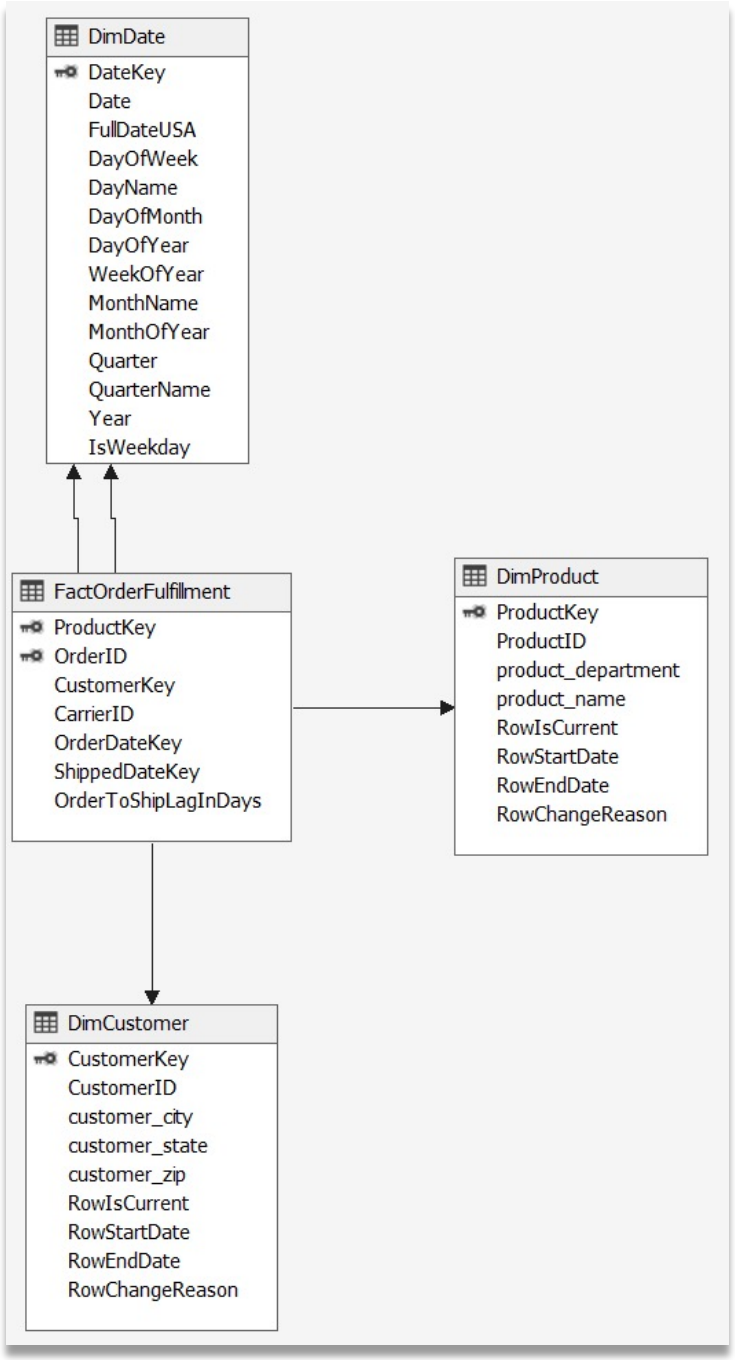




Star Schema & Cube

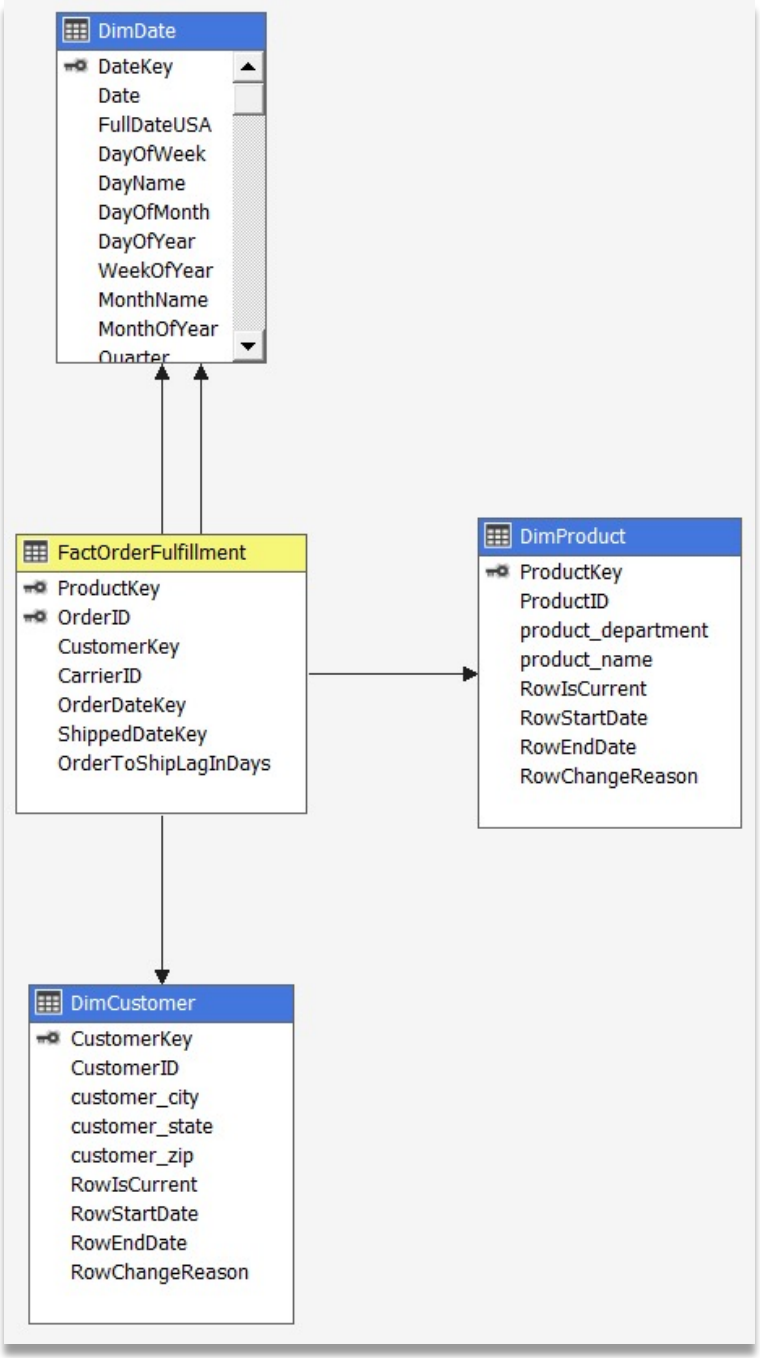
Star Schema

- The star schema contains a single fact table in the middle representing a business process for the organization.
- The fact table is surrounded by dimensions that provide context to the information contained by the fact table.
- Order Fulfillment has the business keys connected to Product and Order along with connections to Customer, Carrier, Order Date, Shipped Date, and the derived Order to Ship Lag in days.



MOLAP Order Fulfillment Cube

- The Multidimensional Online Analytical Processing (MOLAP) cube contains the three dimensions contained within the data warehouse:
  - Date
  - Product
  - Customer
- The Fact Table Order Fulfillment in the center of the cube drives each order processed by the merged companies.
- Measures within the cube include the Order to Ship Lag aggregated by order instead of looking at a single row in the dimension table to prevent skewing of the average order fulfillment time in favor of larger orders.



Business Intelligence

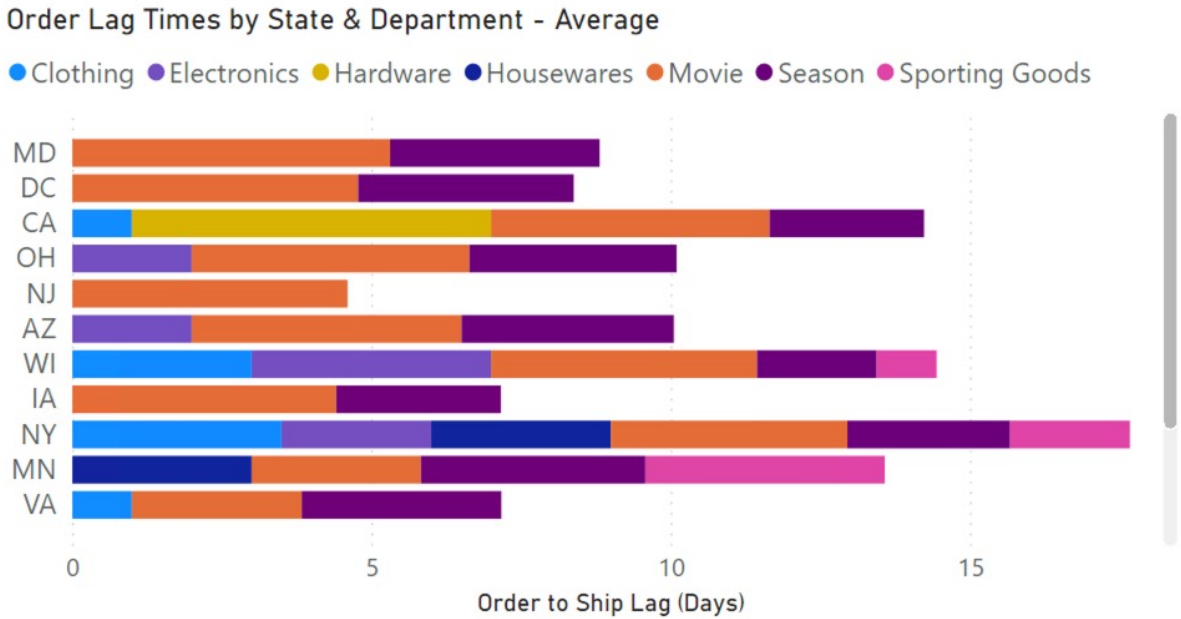
Business Intelligence Goal

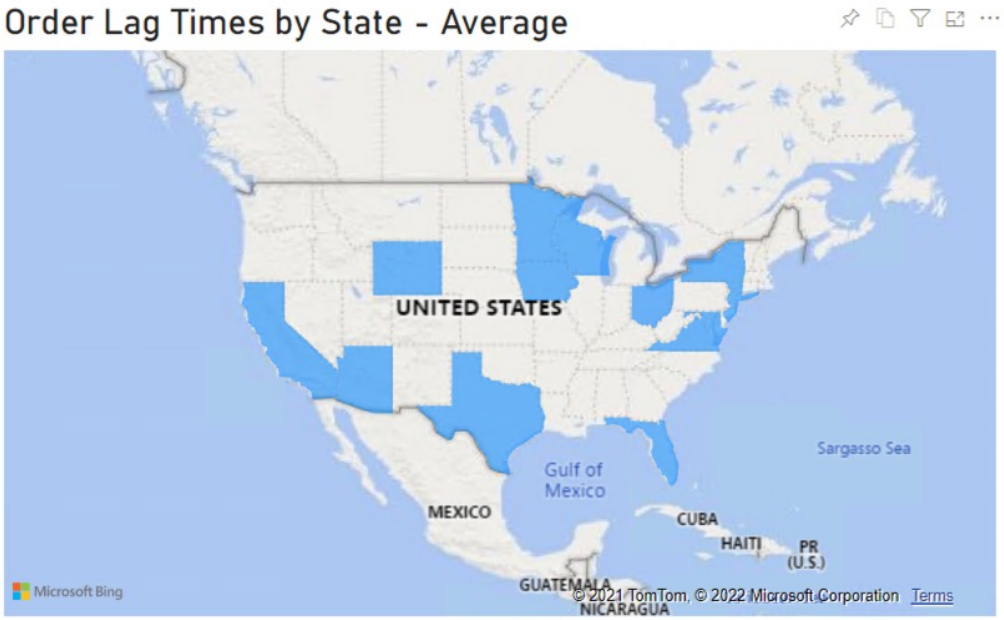
Empower the business to perform Analytics

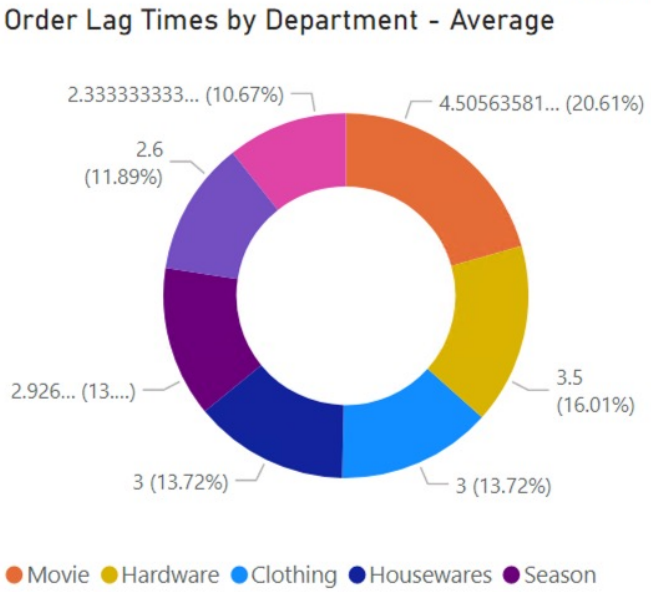
Allow access to multiple dimensions to slice and filter data

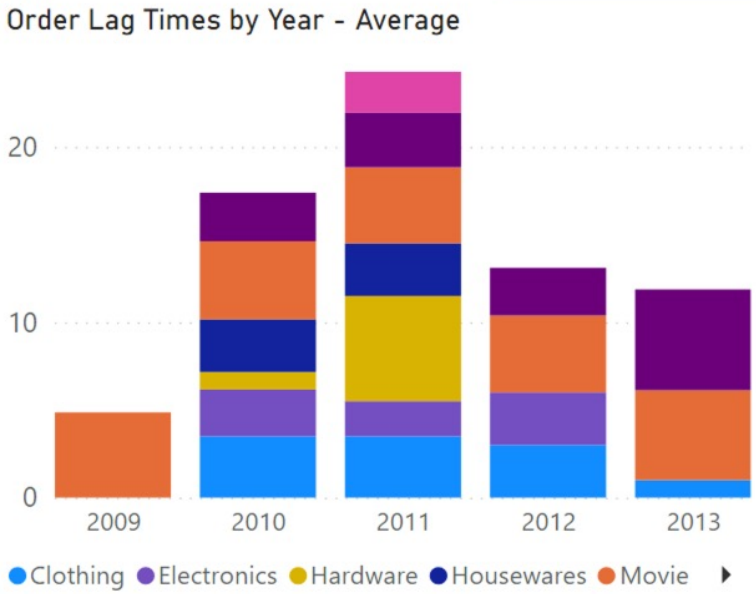
Provide tools necessary for visualization

Order Fulfillment Dashboard









1/1/2009 12/31/2014

Quarter

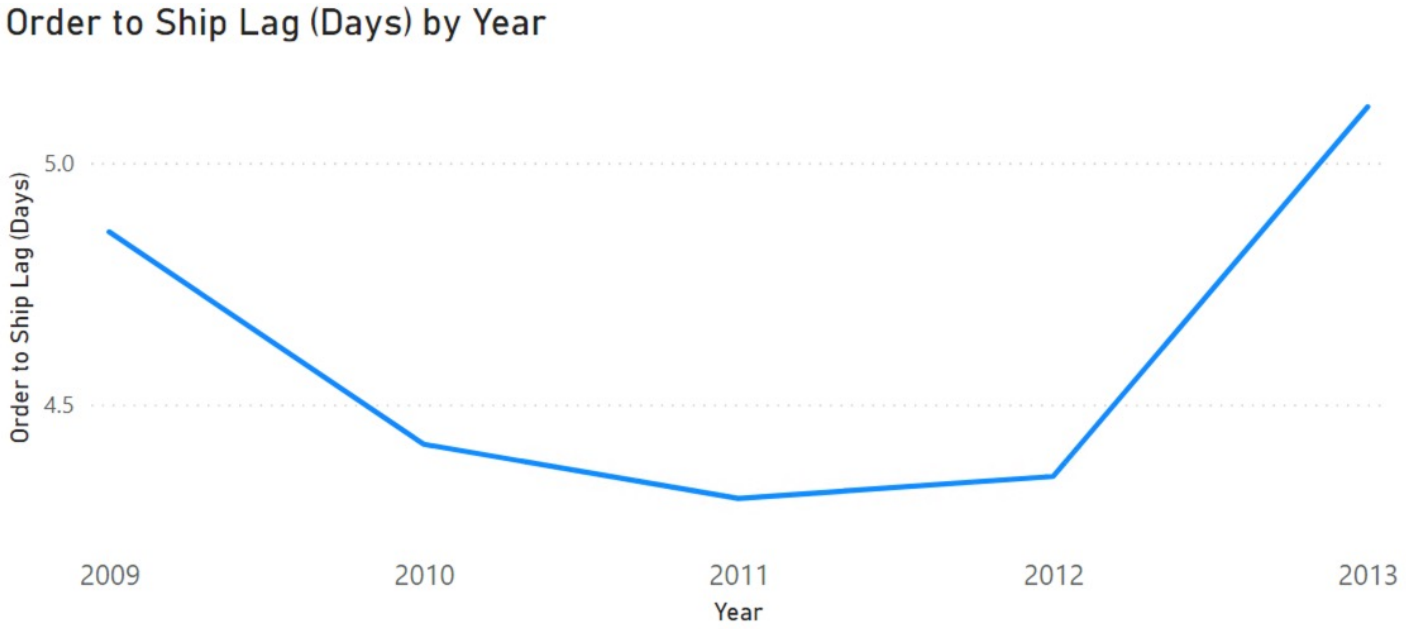
All

Order Lag Times Overall - Average

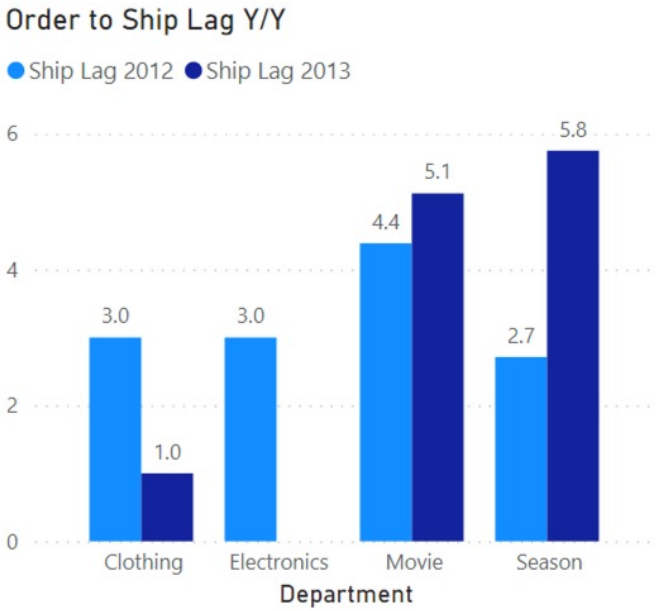
4.48

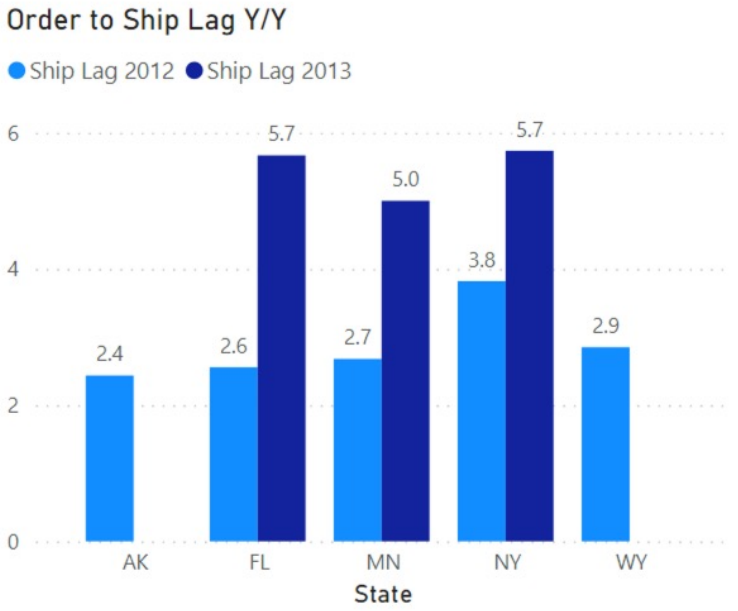
Average	Median
Count	Stdev

Fulfillment Health



Quarter	2009	2010	2011	2012
Qtr 1				
January	4.52	4.19	4.34	4.02
February	4.97	4.41	4.45	4.58
March	5.65	4.58	3.86	4.73
Qtr 2				
April	4.21	4.43	3.95	4.44
May	4.72	4.65	4.22	4.04
June	5.17	4.36	4.29	4.38
Qtr 3				
July	5.06	4.40	4.94	4.52
August	4.52	4.60	4.45	4.46
September	5.69	4.26	4.12	4.06
Qtr 4				
October	4.63	4.21	4.42	4.20
November	4.41	4.23	4.42	4.56
December	5.03	4.70	4.09	4.24

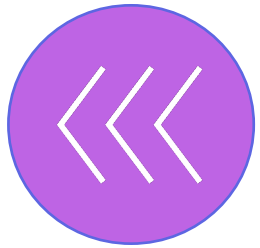




Average	Median
Count	Stdev

Business Recommendations

Capture received date to perform end-to end BI



Reduce lead time for processing movie orders

Offer promotional discounts to customers who experience high lead time

Transform Fudgeflix into a full-fledged streaming service