

# Developing a Data Warehouse and Business Intelligence System

## DUNKIN' DONUTS

*MIS 633-A Team-5*

***Team Members:***

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## Introduction:

- ❑ Dunkin' Donuts is a global leader in the quick-service restaurant industry, with over 12,900 restaurants in 40 countries
- ❑ The company generates vast amounts of data from its various operations, including sales transactions, customer interactions, and inventory management.
- ❑ To effectively manage this data and derive actionable insights, Dunkin' Donuts is embarking on a project to develop a comprehensive data warehouse and business intelligence system.

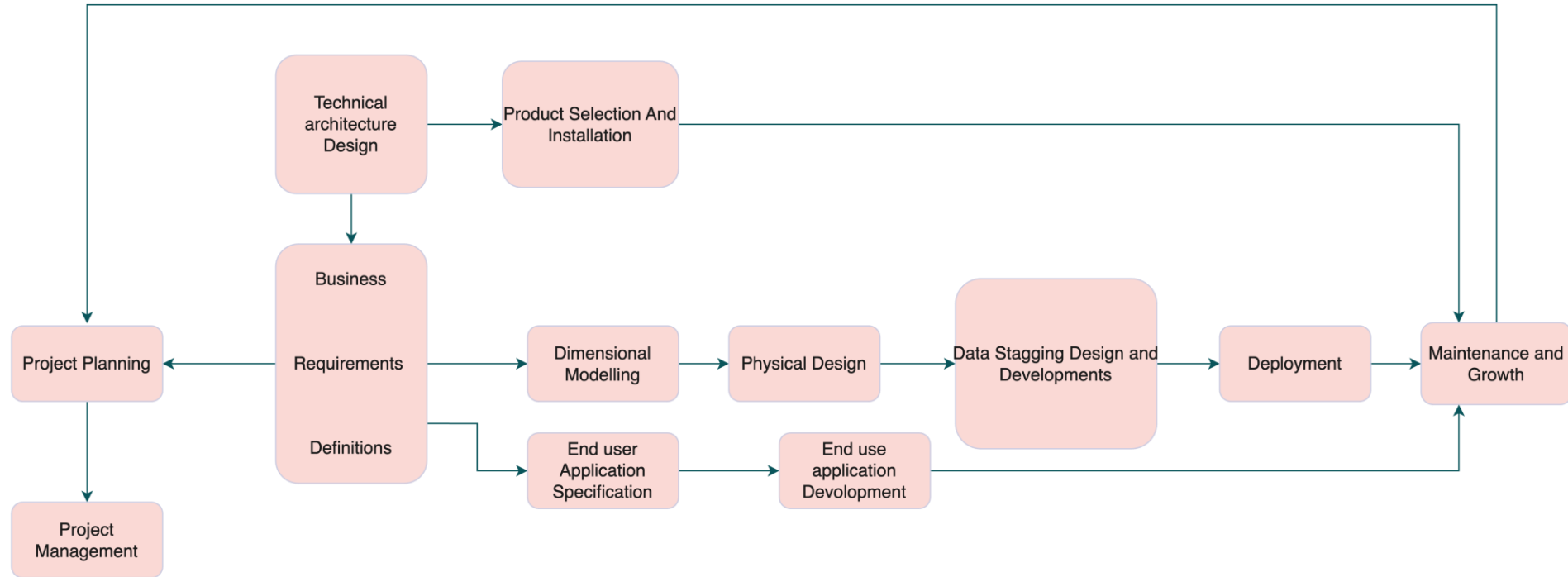


# Project Objectives

- ❑ Establish a centralized repository of Dunkin' Donuts data from disparate sources.
- ❑ Implement a robust data warehouse architecture to ensure data integrity, security, and scalability.
- ❑ Develop a business intelligence system to provide users with self-service access to data visualizations, dashboards, and reports.
- ❑ Enable data-driven decision-making across all levels of the organization.



# Business Dimensional Lifecycle





# Opportunity Matrix

Business Process / Event	Sales	Logistics / Delivery	Customer Service / Marketing	Operations / Finance
1. Walk-In Transactions			X	X
2. Mobile Order Transactions		X		
3. Processing Walk-In Transactions	X			
4. Processing Supplier Transactions	X			
5. Restocking Inventory		X		X
6. Priority Customer Identification			X	

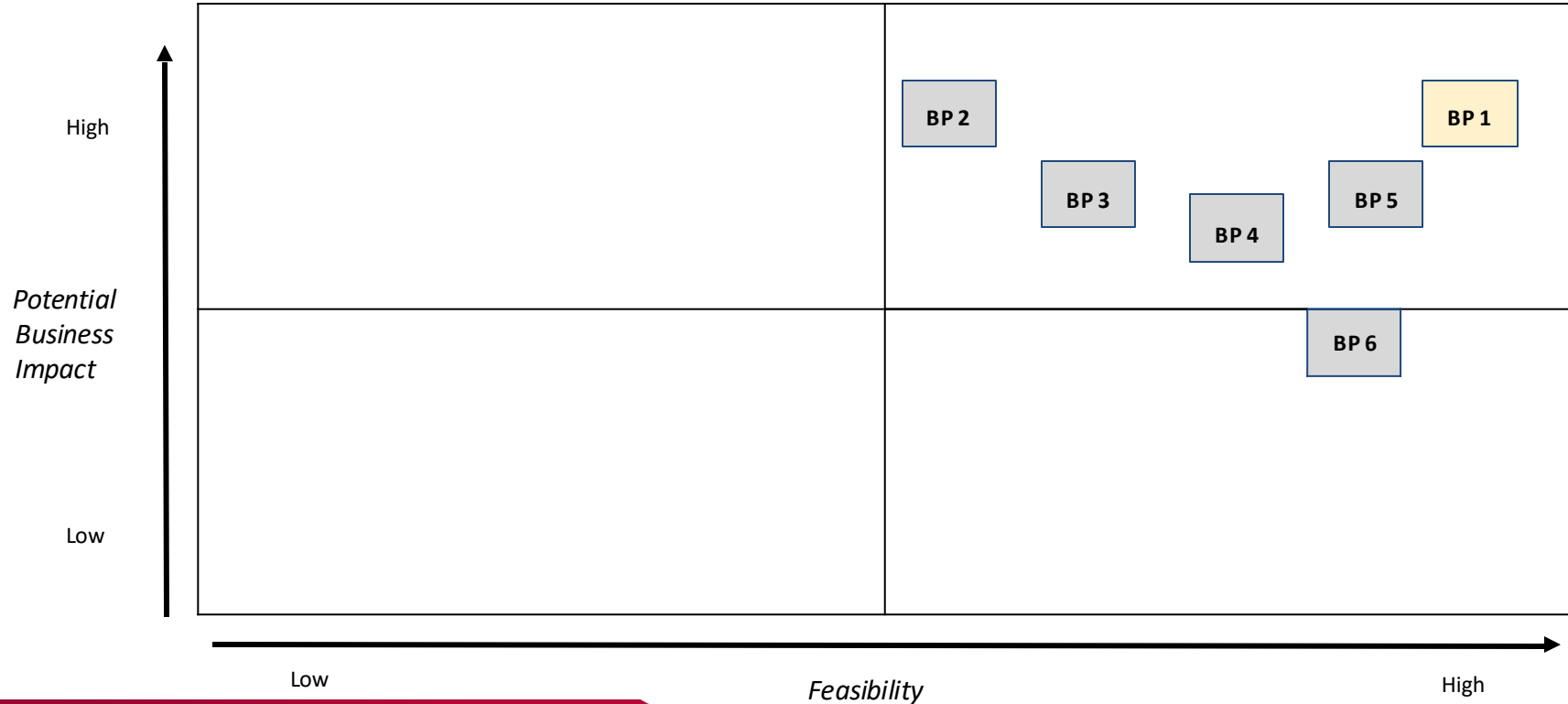


# High Level DW Bus Matrix

Business Process / Event	Date	Product	Payment Method	Timestamp	Promo Discount
1. Walk-In Transactions	X	X	X	X	X
2. Shipping Sales Transactions	X	X	X		X
3. Processing In-store Transactions	X	X	X		X
4. Processing Shipping Transactions	X	X	X		X
5. Restocking Inventory		X	X		
6. Priority Customer Identification				X	

Confirmed Dimensions

# Prioritization Grid



# Data Transformation



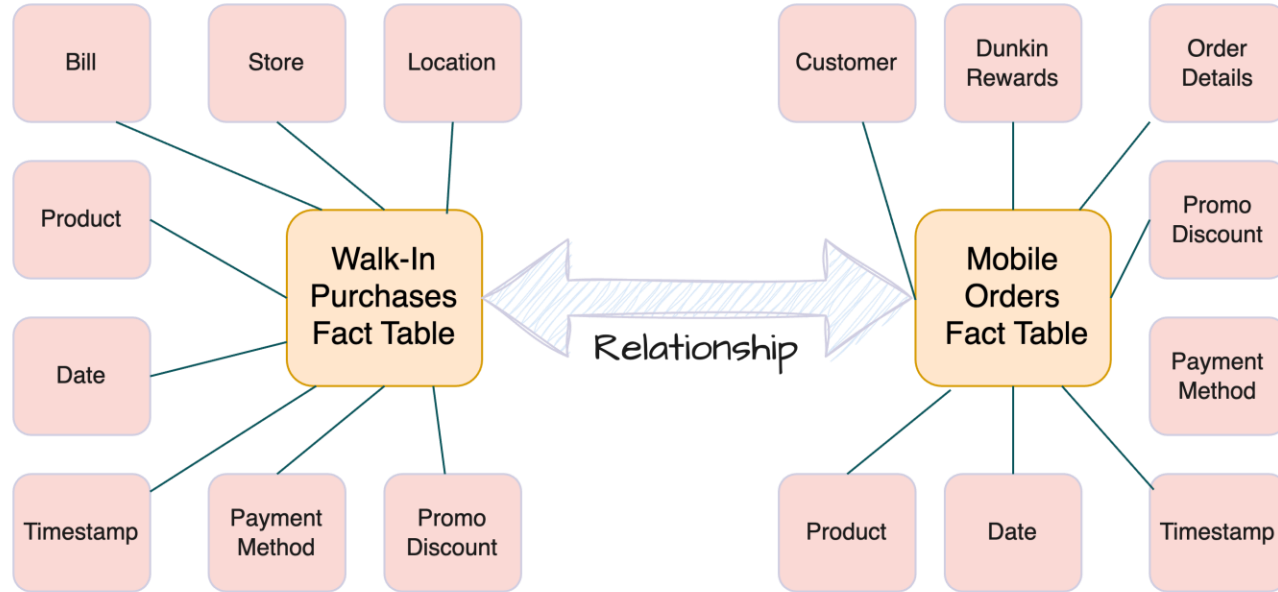
After extraction, the information should be changed. For example, bringing together information types, managing spelling blunders, wiping out information uncertainty, and parsing into standard configurations. Information change is normally the most intricate part. It is additionally the longest advance in ETL improvement. The scope of information change is extremely wide. The interaction is to change the information from basic information type to very intricate information cleaning innovation.

## (7) Data Transformation Rules:

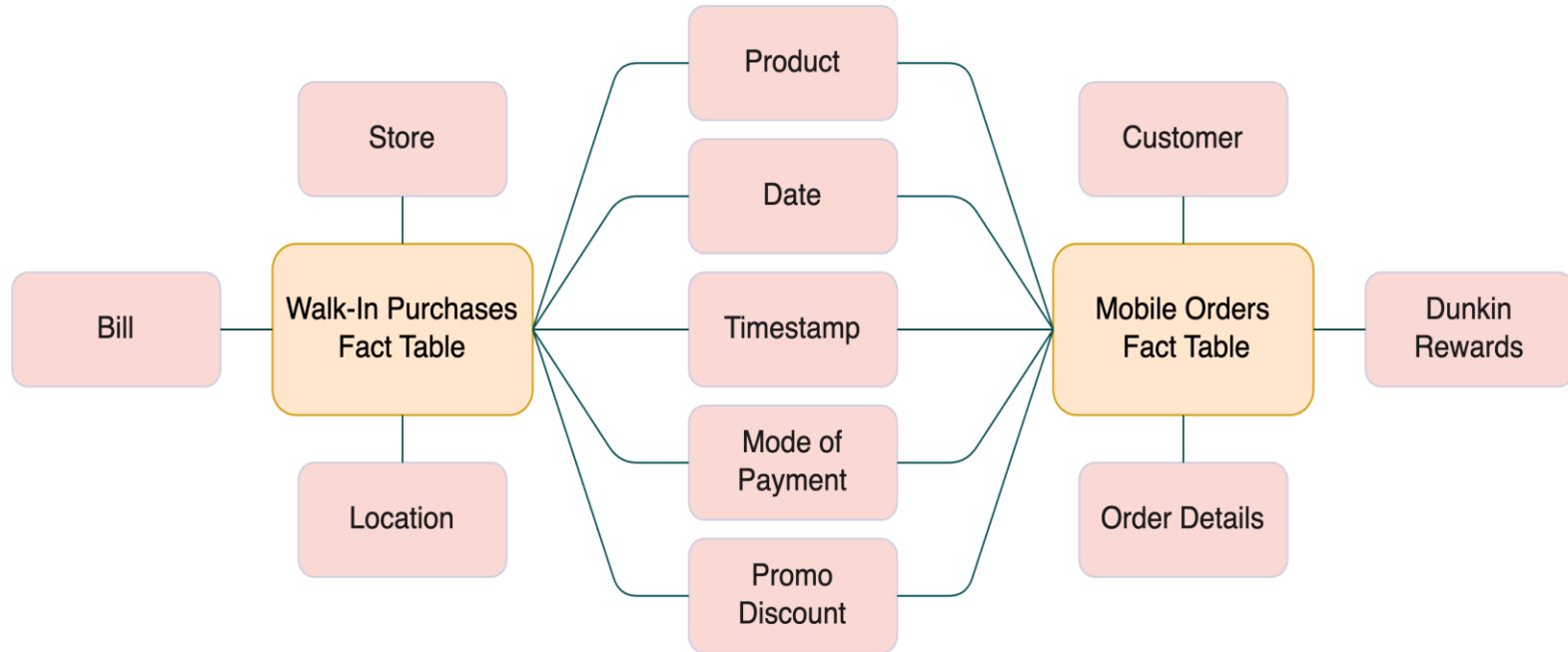
1. Only specific data columns are loaded
2. Unified coding
3. Reordering improves query performance
4. Merge data sources and remove duplicates
5. Row column Transformation
6. Merge duplicate columns
7. Data validation



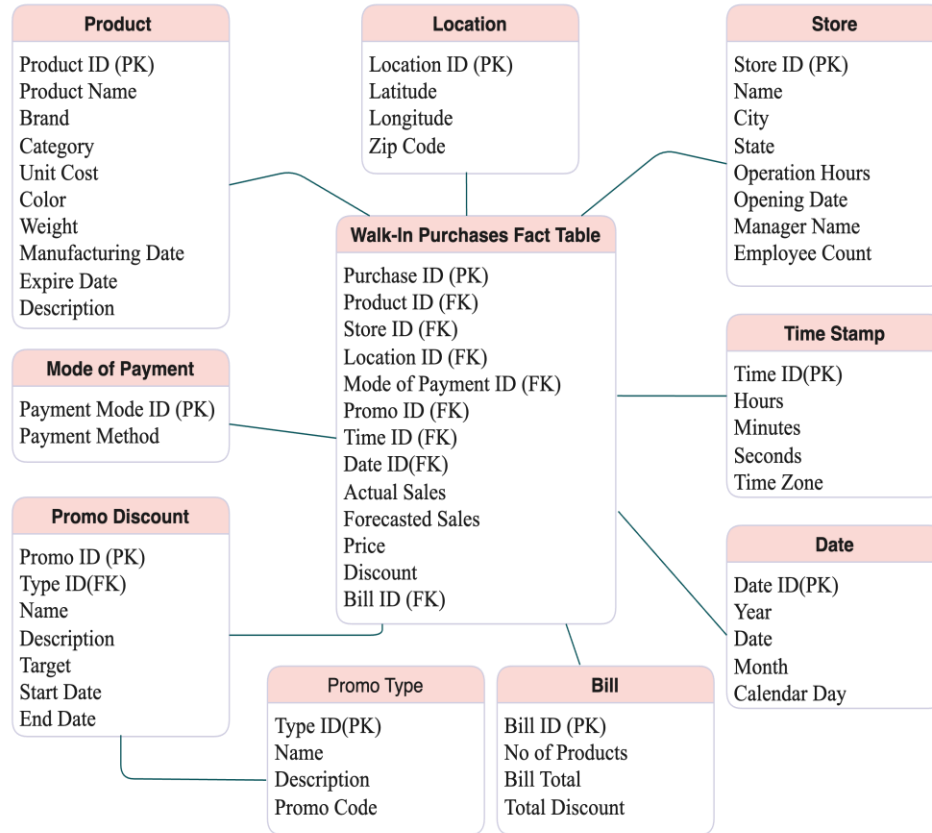
# Logical Fact Diagram



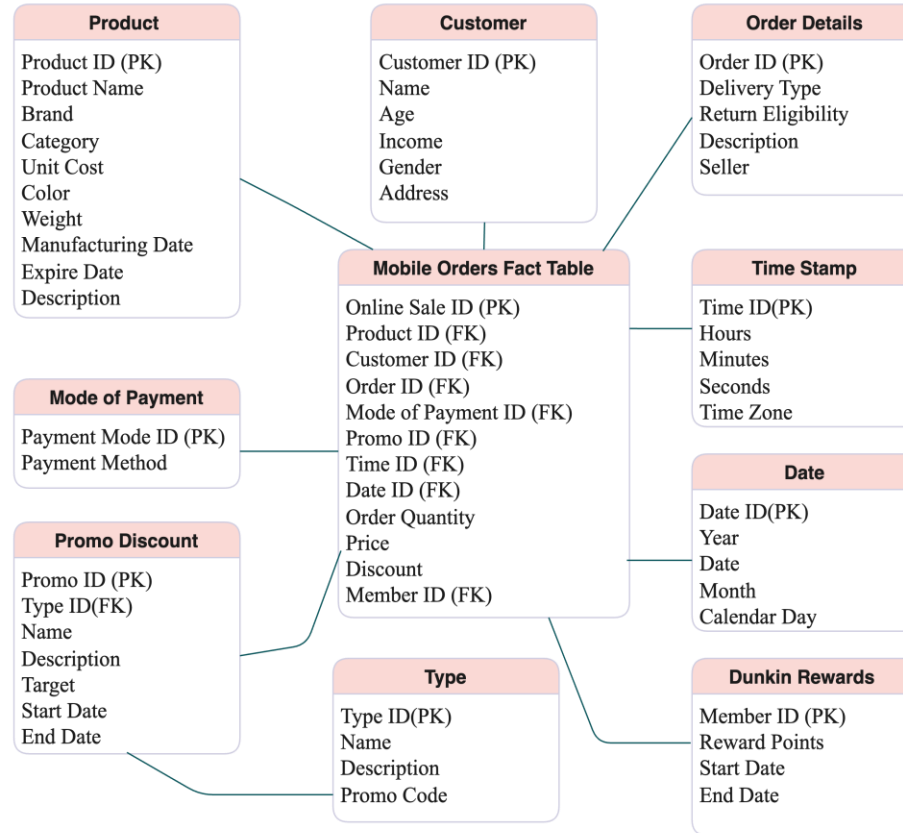
# High Level Data Model



# Star Schema of Walk-In Orders Fact



# Star Schema of Mobile Orders Fact





# Dimension Attribute Description: Store Dimension

Name	Description	Cardinality	Slowly Changing Dimension Policy	Sample Values
<b>Store id</b>	ID number assigned for the store.	5678	No Update	1, 2, 3, 4, 5, 6, 7, 8, 9... 5678.
<b>Name</b>	Name of the Store	5678	Type 2	Union 33, Hoboken Rail Station,.....
<b>City</b>	City where the store is located.	967	Type 2	Hoboken, Los Angeles, .....
<b>State</b>	State where the store is located.	12	Type 2	New Jersey, Florida, .....
<b>Operating Hours</b>	Opening and Closing time of the store.	8	Type 1	6:00 – 18:00, 8:00 – 20:00, .....
<b>Manager Name</b>	Name of the Store Manager.	3	Type 1	Michael Ross, Stuart Radley, .....
<b>Employee Count</b>	No. of employees working at the store.	x	Type 1	5,8,4....

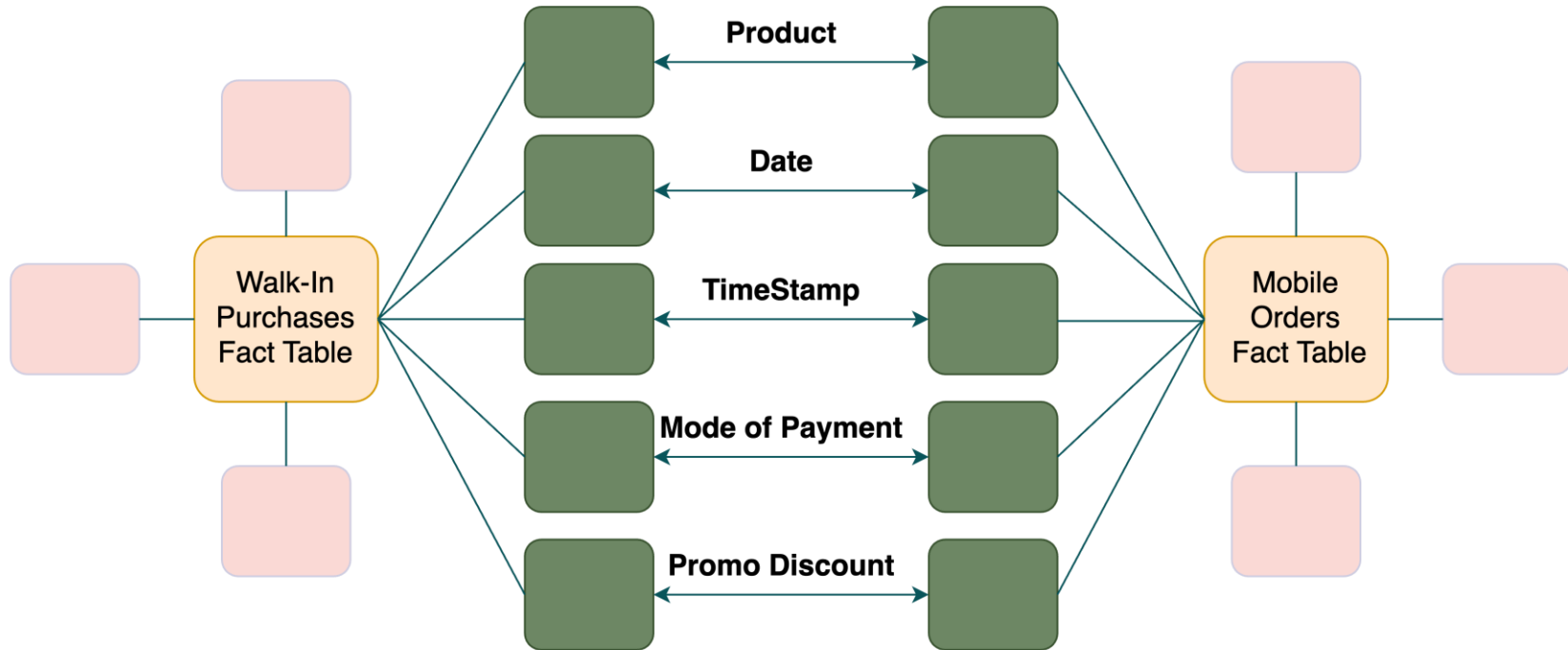


# Conformed Dimensions

The Dimensions that are common between all the facts are called Confirmed Dimensions. In our Dunkin Donuts DW, the following are the confirmed Dimensions:

- ☐ Product
- ☐ Date
- ☐ Timestamp
- ☐ Mode of Payment
- ☐ Promo Discount

# Conformed Dimensions (cont'd.)





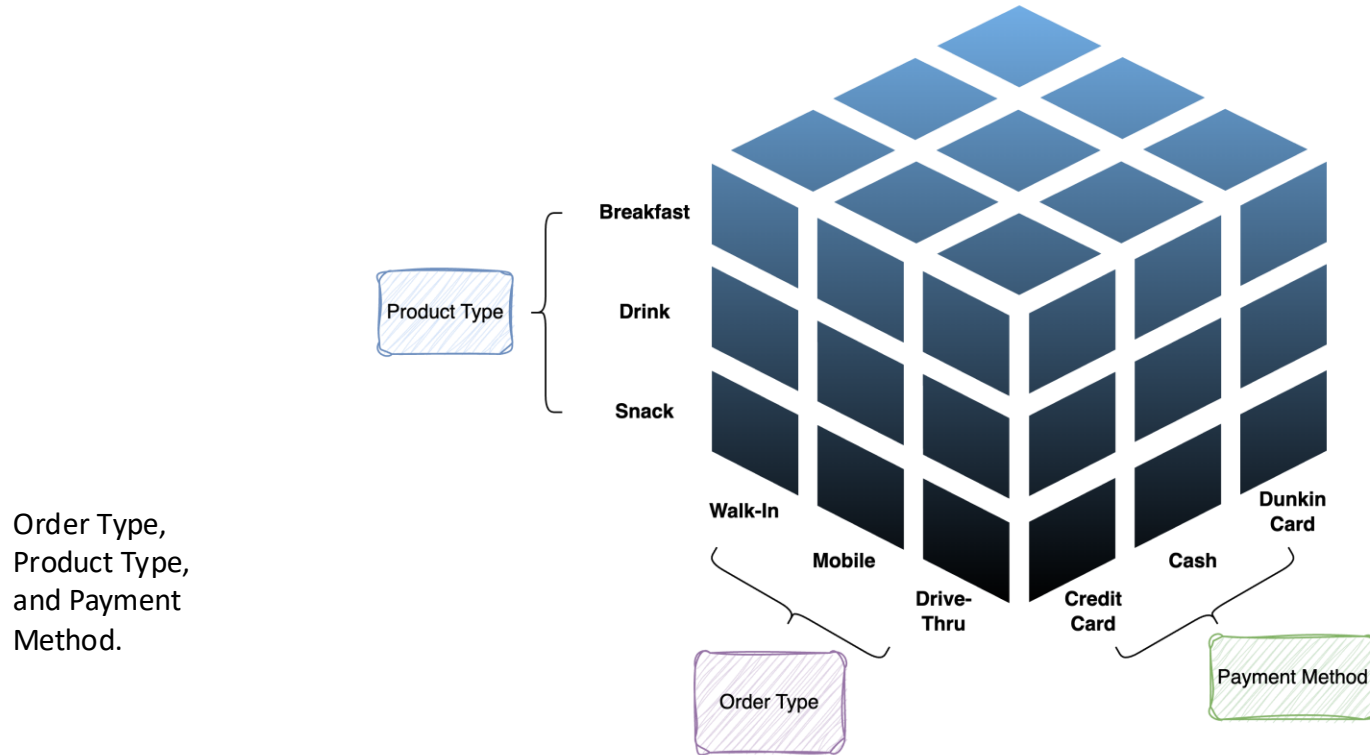
# Transformation Rules

A data transformation involves converting a collection of data values from the data format used by a source data system to the data format employed by a destination data system.

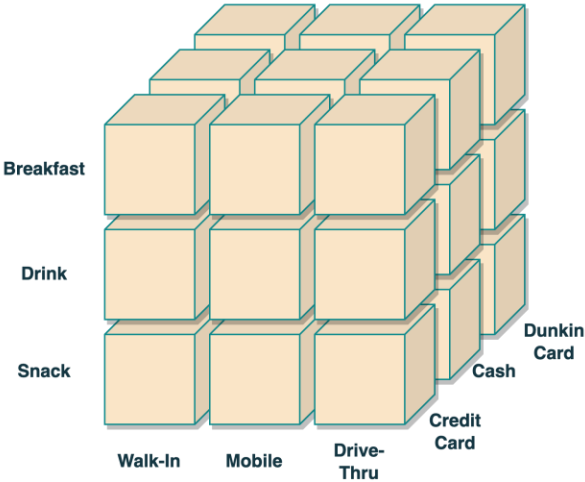
Rule Type	Paraphrased Description			
Move	Copy data from source to destination without any transformation.			
Transform	Convert data from source to match the destination format.			
Default	Assign default values to destination fields when source values are missing.			
Derive	Calculate destination values based on source data using arithmetic or other rules.			
Drop	Exclude specific fields from the source data when loading into the destination.			
Lookup	Enrich destination data by matching source values to a reference table.			



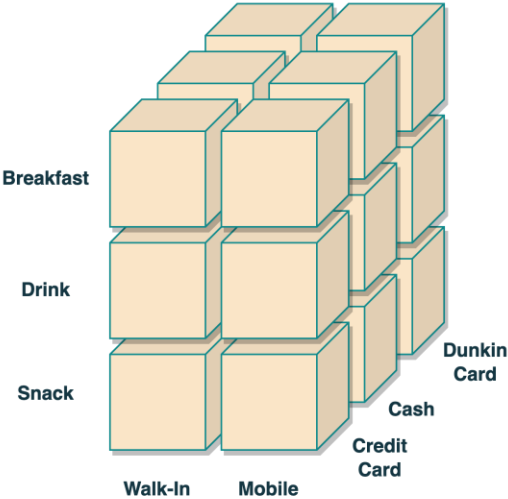
# OLAP MDDB Cube



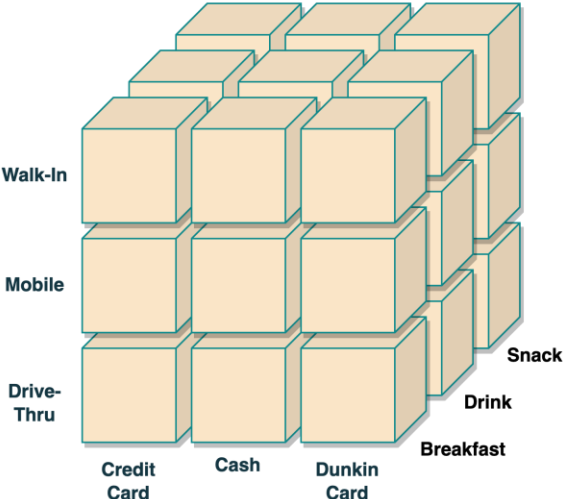
# OLAP MDDDB Cube (cont.)



**Drill-Down**

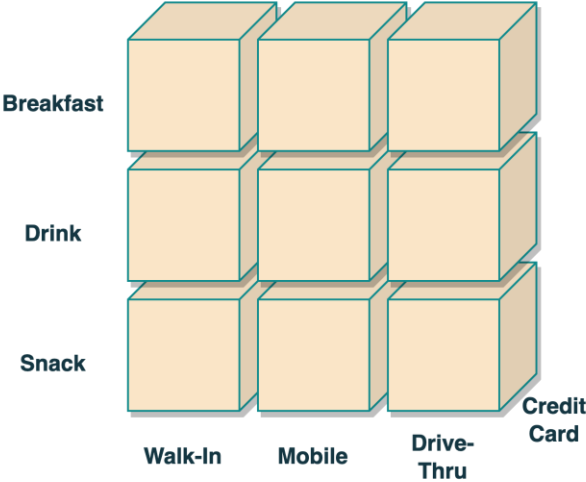


**Dice**

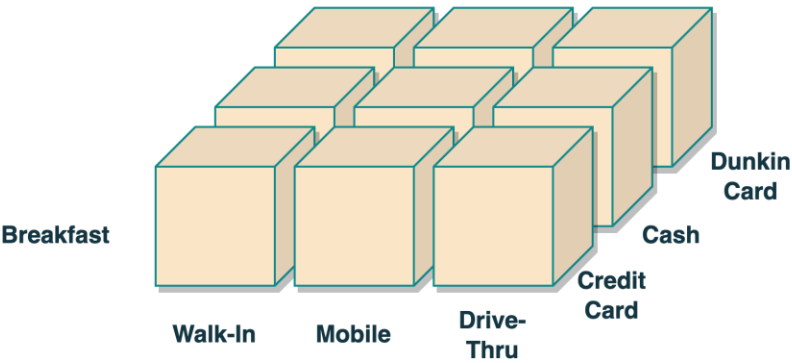


**Pivot**

# OLAP MDDB Cube (cont.)



**Roll-Up**



**Slice**



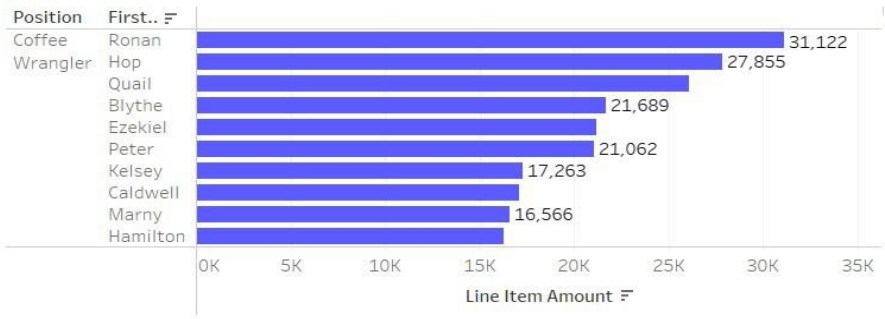
BI will enable Dunkin' Donuts to:

- ❑ Dunkin' Donuts uses BI to analyze sales data by menu item, location, and time of day to identify popular items and areas for potential expansion.
- ❑ By analyzing historical sales data and current demand trends, Dunkin' Donuts can optimize its inventory levels to reduce waste and ensure that products are always in stock.
- ❑ Dunkin' Donuts can use BI to analyze customer behavior and preferences to develop targeted marketing campaigns and personalize customer experiences.
- ❑ BI will help Dunkin' Donuts to streamline its operations, reduce costs, and improve customer service.

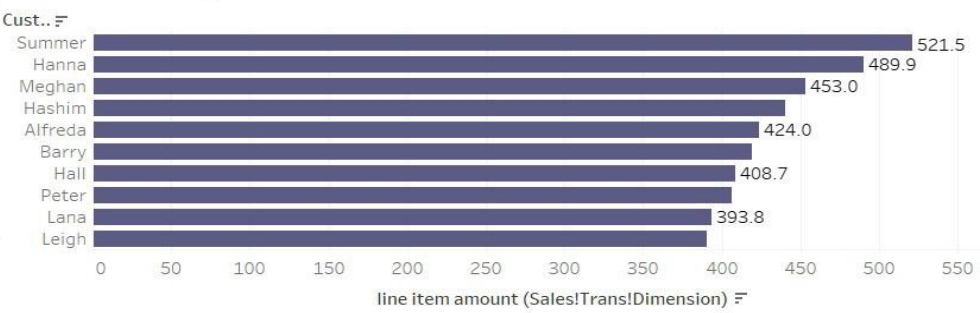


# Executive Dashboard using Tableau

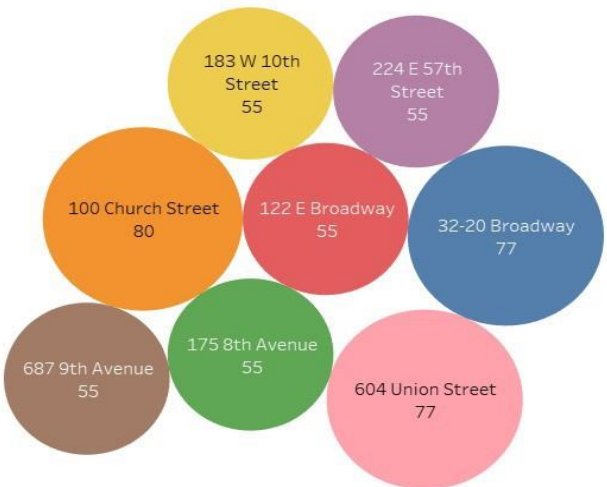
Top 10 coffee wrangler



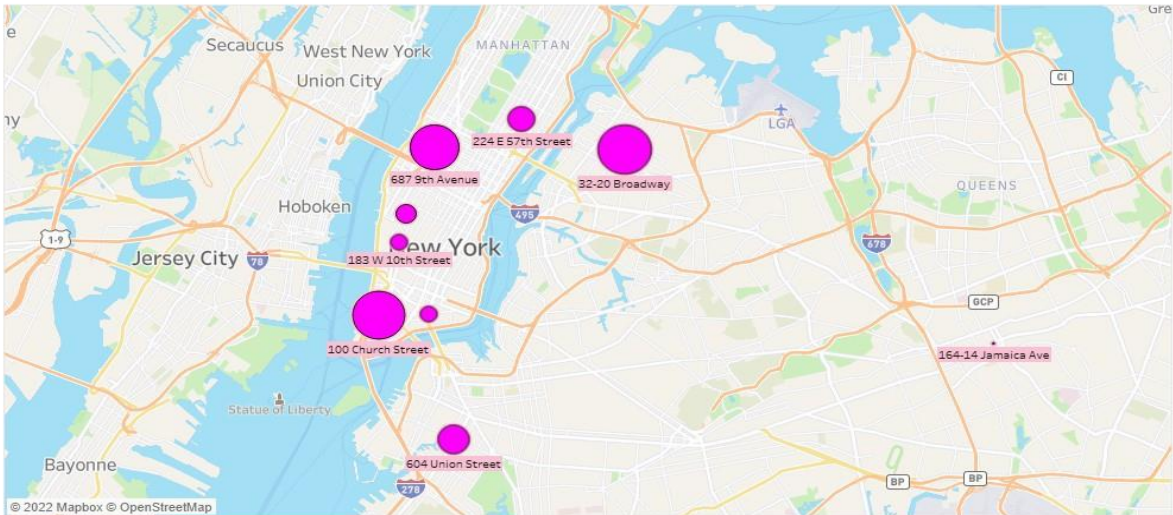
Top 10 customer by sales



Types of products available in each store



Size indicates sales of the store

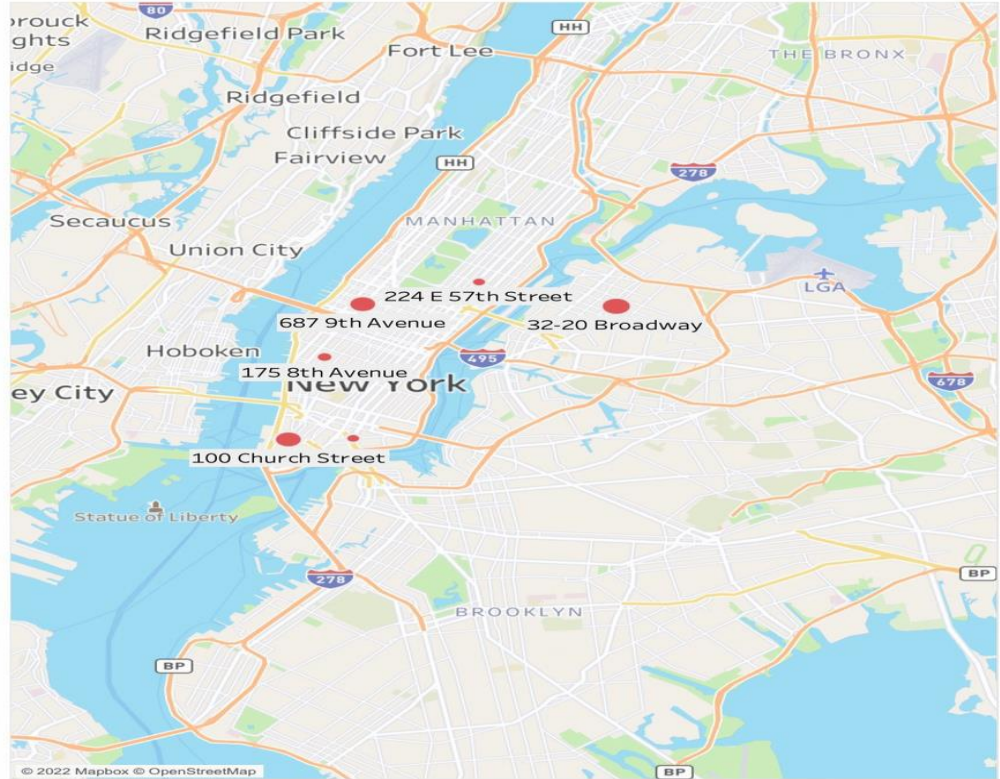


# Sales comparison between Wednesday and Sunday

Size indicates sales of each store on wednesday



Size indicates sales of each store on sunday

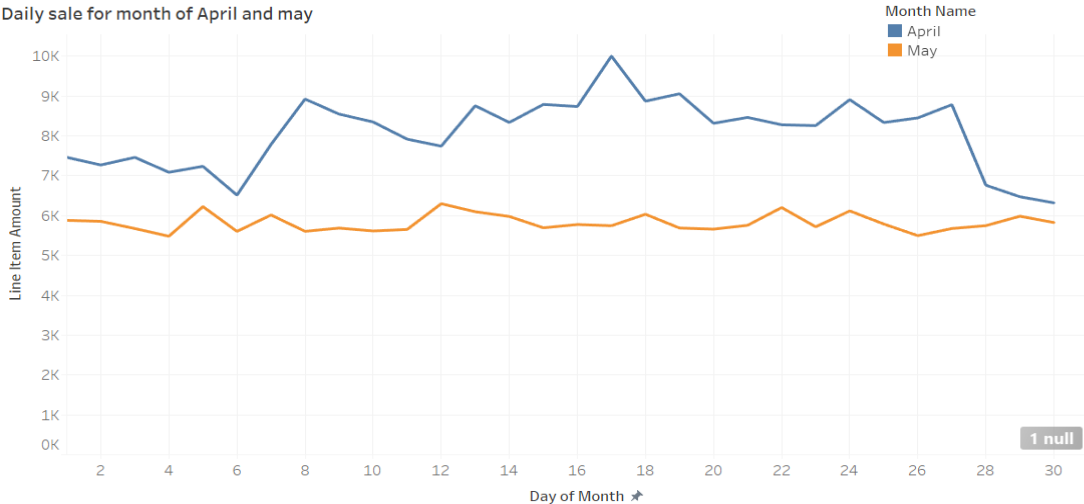




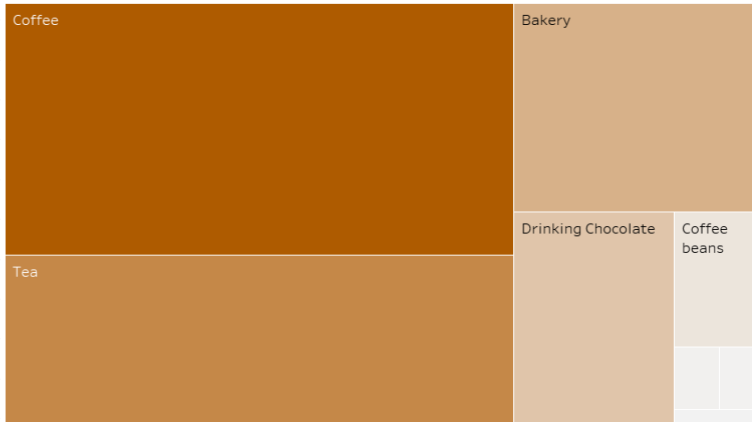
# Sales Manager Dashboard



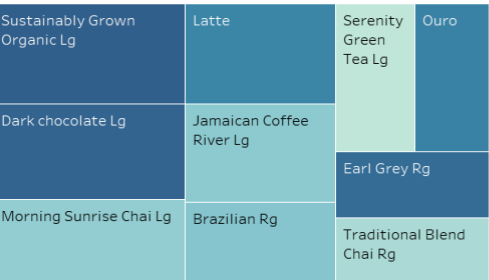
Daily sale for month of April and may



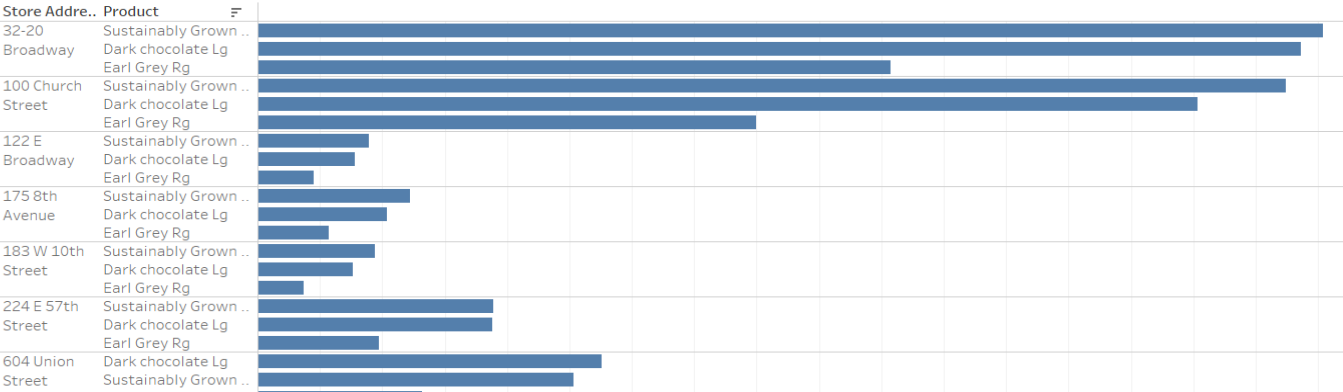
Sales By category



Top 10 products by sales

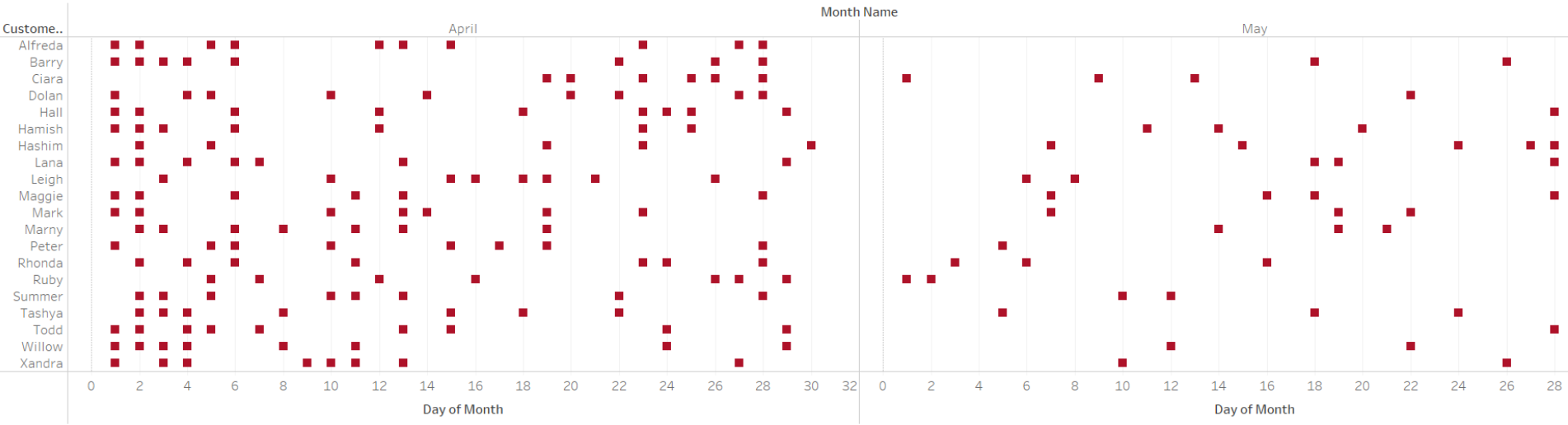


Top 3 products by sales in each store



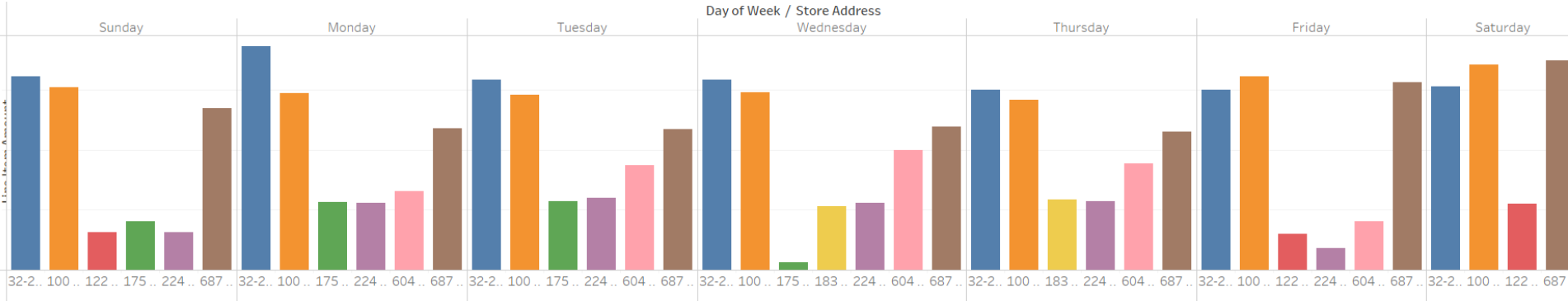


Visits by customers

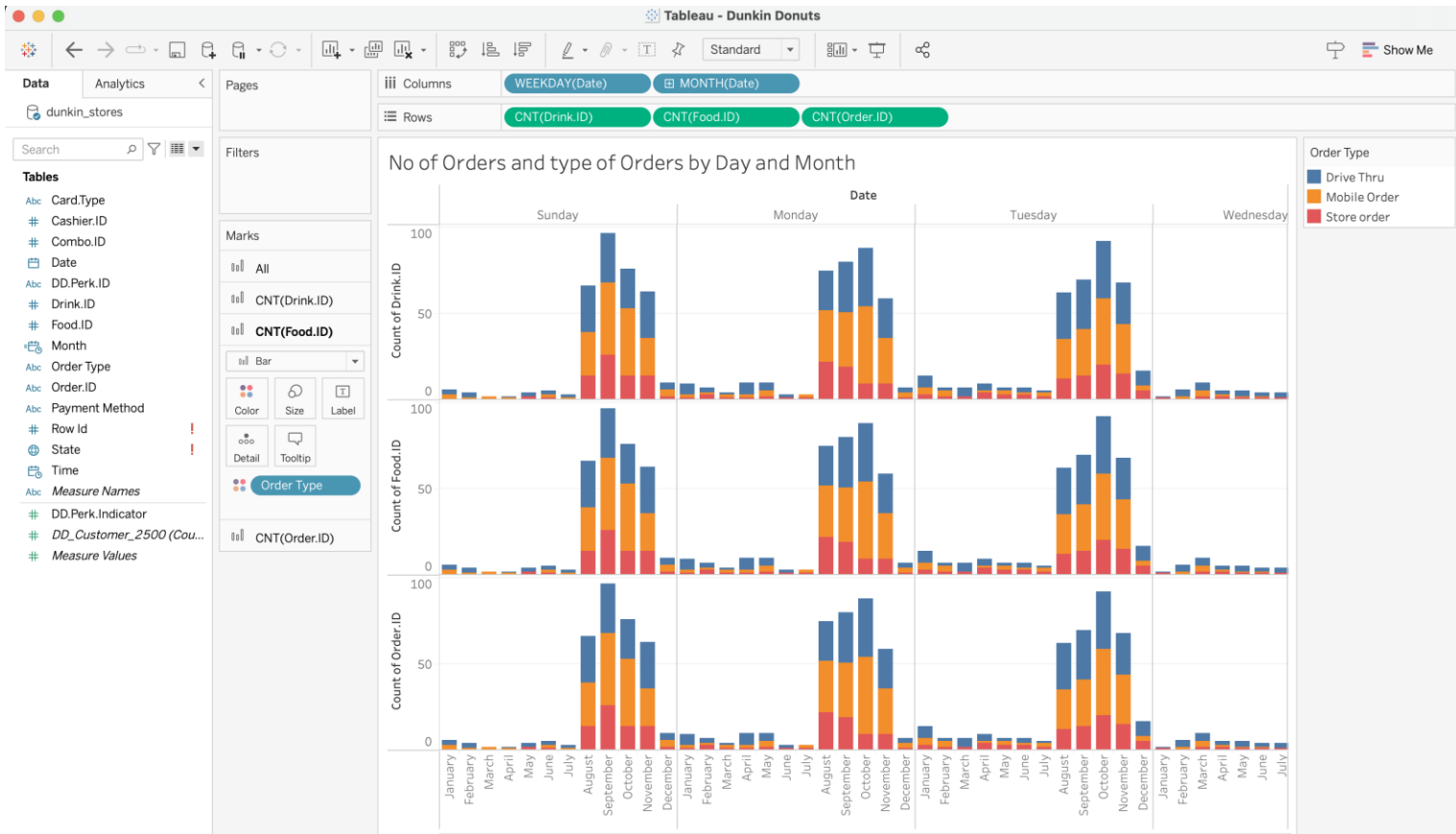


Store Ad.. 32-20 Broad.. 100 Church .. 122 E Broad.. 175 8th Ave.. 183 W 10th .. 224 E 57th .. 604 Union S.. 687 9th Ave..

Sales By week









# Conclusion:

- A data warehouse and business intelligence system can provide a number of benefits to an organization, including:
  - Improved decision-making
  - Increased efficiency
  - Reduced costs
  - Enhanced customer satisfaction
- The success of a data warehouse and business intelligence system depends on several factors, including:
  - Careful planning and design
  - Data quality
  - User adoption
- Organizations that are considering implementing a data warehouse and business intelligence system should carefully consider their needs and goals, and develop a comprehensive plan for success.



Thank you  
for your  
Time!!