Project 1:

DATA WAREHOUSING FOR BUSINESS INTELLIGENCE

Written By

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A Report Submitted in Partial Fulfillment of

the Requirements for

ITCS453 Data Warehousing and Data Mining

Faculty of Information and Communication Technology

Semester 2/2024

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Executive summary

This project is about the design and implementation of a Data Warehouse and Business Intelligence (BI) solution which improves the level of data driven decision making. The topics so far covered include business needs, data architecture, ETL, and reporting. The objective of the project is to solve specific business problems through the use of a comprehensive Data Warehouse and BI framework. It consists of business problem definitions, business goals, and stress on the importance of data analysis for increasing the operational efficiency of a company.

The business has problems with data availability, reporting, and evaluating the staff's workload performance. The requirements stress the need for a fully-fledged data warehouse which will help in the development of advanced operations analytics, tools for accurate reporting, as well as facilitate easier decision making. The project is concerned with the identification of important data sets, the construction of the ER diagram for the OLTP database, and the creation of the data dictionary. This design provides for smooth transition and mapping of data from the operational systems to the analytical reporting systems.

There are key measures and dimension tables outlined to allow detailed staff performance analysis. In support of this, a multidimensional model is built with the Fact_Staff_Performance table at the core to correlate staff productivity and their outcome. The ETL procedure starts with mapping the OLTP systems to the OLAP structures, extracting the date dimensions, and functioning Tableau Prep to streamline the workflow. The sequential execution of ETL makes certain that the data transformation is performed reliably and within the timeline set out.

The Business Intelligence component is built to answer six important questions that are augmented by interactive visualizations, enabling users to go beyond static reports. These reports delve into the crucial areas of employee productivity, business operational activities, and overarching business intelligence trends.

The result of this project accommodates the needs of data architecture and provides users and business leaders within the organization with accurate analytics and visualization to improve their decision making.

1. Project Overview

1.1 Business Case Overview

- **Company Background:**
    - Adidas was founded in 1949, is a globally recognized sportswear manufacturer headquartered in Herzogenaurach, Germany. The company specializes in designing, producing, and distributing athletic footwear, apparel and accessories. Adidas operates through a complex global supply chain and extensive retail network, with revenue generated from direct product sales, licensing agreements, and e-commerce platforms.
- **Revenue Streams:**

  Adidas's revenue is primarily driven by:
    - **Footwear Sales:** The most significant revenue stream, encompassing various categories such as running shoes, sneakers, cleats, and sports-specific footwear for basketball, soccer, and tennis.
    - **Apparel Sales:** Includes sports jerseys, athletics wear, compression clothing, and casual lifestyle apparel designed for performance and fashion.
    - **Accessories:** Comprising bags, socks, hats, gloves, and sports equipment like balls, and wristbands
- **Cost Structure:**
    - **Manufacturing and Production Costs:** Involving in labor expenses, raw material procurement, factory operations, and supply chain logistics
    - **Marketing and Advertising:** Investments in sponsorships, brand partnerships, digital marketing, and influence collaborations.
    - **Research and Development:** Expenses associated with innovation, product development, sustainability efforts, and technological advancements in athletic performance.
- **Key Business Processes:**
    - **Product Design and Innovation:** Developing new and improved products to meet market demands.
    - **Supply Chain Management:** Overseeing the production and distribution of products globally.

- **Marketing and Sales:** Promoting products and driving sales through various channels.

1.2 Business Problems and Requirements

Identified Business Problems:

- **Inventory Management:** Overstocking or understocking issues, leading to lost sales or excessive holding costs
- **Sales Performance Analysis:** Limited insights into which product categories, regions, or customer segments contributed most to revenue.
- **Customer Behavior Insights:** Lack of a data-driven approach to understanding customer behavior, preferences, and customer retention strategies.

Requirements for Building a Data Warehouse for BI:

To address these challenges, Adidas requires:

- **Integrated Data Sources:** Combining real-time and historical data from sales, supply chain, marketing, and customer interactions.
- **Real-Time Analytics:** Providing up-to-date information into demand forecasting, stock optimization, and revenue tracking.
- **Scalable Infrastructure:** A robust system can handle increasing data volumes and support global operations.

1.3 Objectives and Scope

Project Objectives:

This project is focusing on developing a centralized data warehouse and implementing business intelligence tools to enhance Adidas's sales performance in the U.S. market. This will involve data from various sources to provide real-time information on sale trends, top selling items, and staff performance. The system will enable Adidas to optimize inventory management, refine marketing strategies, and improve decision-making through data-driven analysis. By predictive analytics, Adidas can ensure a balanced stock level, enhance customer engagement, and drive revenue growth.

Scope of the Project:

- **Data Integration:** Aggregating data across departments, including sales, supply chain, customer engagement, and marketing.
- **Analytical Reporting:** Creating interactive dashboards, real-time sales tracking, and trend analysis reports.
- **User Training:** Ensuring seamless adoption of BI tools among Adidas's business and technical teams.

1.4 Importance of Data Warehouse and BI

Data warehouse and BI solution are crucial for Adidas to remain competitive and enhance operational efficiency. The key benefits include:

- **Improved Decision-Making:** Enabling leadership to make data-backed strategic choices.
- **Operational Efficiency:** data collection, integration, and analysis across global operations.
- **Enhanced Customer Insights:** Understanding customer behavior to refine marketing strategies.
- **Competitive Advantage:** Using data-driven insights to outmaneuver competitors and adapt to market changes.

2. ER Diagrams and Data Dictionary

2.1 Data Sources

Our data is collected from two primary sources:

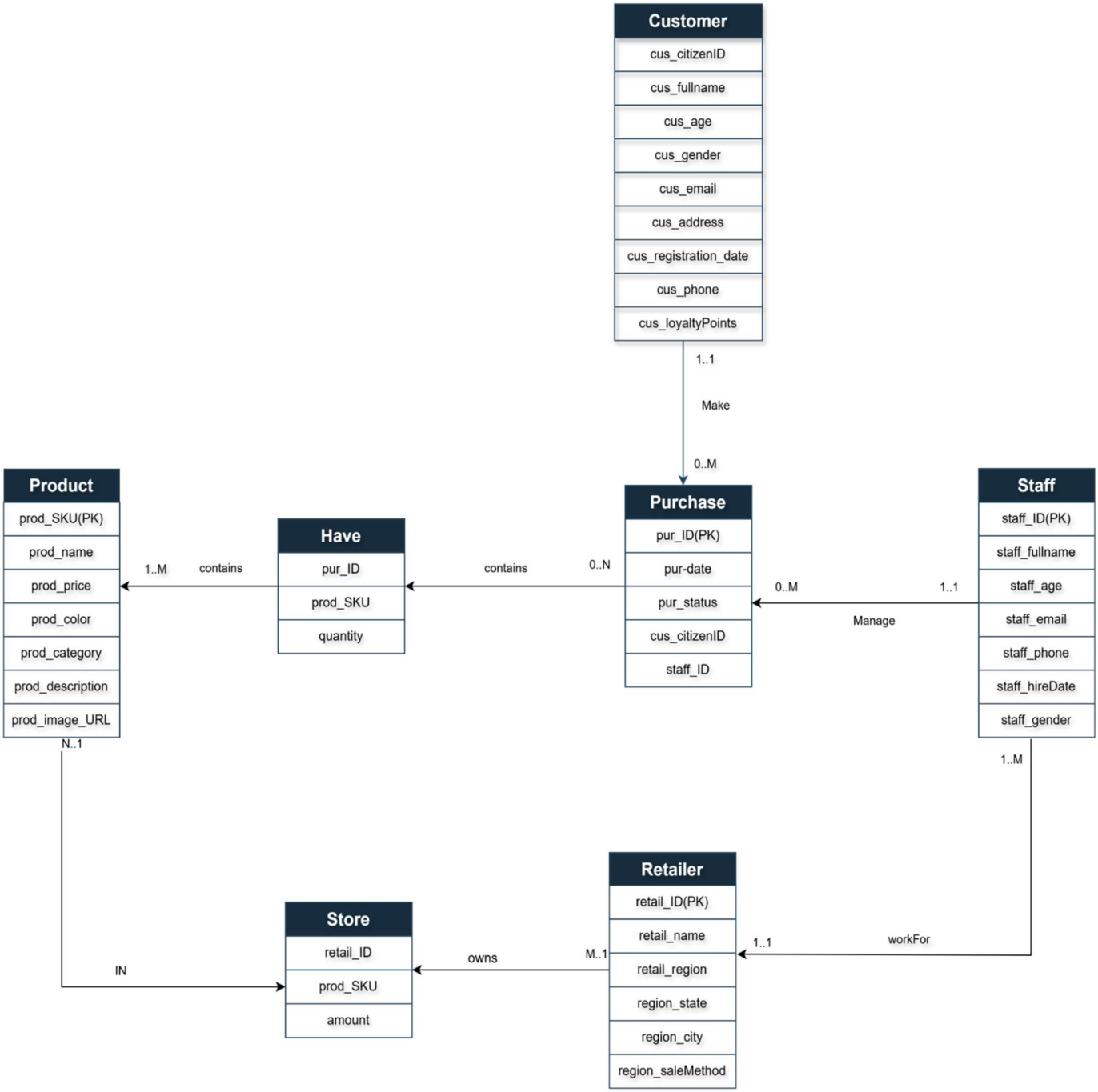
1. **Adidas Webstore Shoe Data**
    - Source: Kaggle Dataset
    - This dataset was selected as it contains information about Adidas products. After data cleaning and synthesis, we extracted key attributes, including:
        - prod_SKU (Product SKU)
        - prod_name (Product Name)
        - prod_price (Product Price)
        - prod_category (Product Category)
        - prod_description (Product Description)
        - prod_image_url (Product Image URL)
2. **Adidas Sales Analysis**
    - Source: LinkedIn Article
    - This dataset was selected after preprocessing. It consists of retail-related data with the following attributes:
        - retail_ID (Retailer ID)
        - retail_name (Retailer Name)
        - retail_region (Retailer Region)
        - retail_state (Retailer State)
        - retail_city (Retailer City)
        - retail_saleMethod (Retailer Sales Method)

Additionally, our team generated five synthetic datasets for further analysis, covering:

- store
- customer
- staff
- purchase
- data table

These datasets were generated due to privacy constraints, as personal and company-related information was not publicly accessible.

2.2 ER Diagram for OLTP Database



2.3 Data Dictionary

- **Product Table**

Name	Data Type	Description
prod_SKU (PK)	INT	Unique identifier for each product
prod_name	VARCHAR(255)	Name of product
prod_price	DECIMAL(10, 2)	Price of product
prod_category	VARCHAR(100)	Category of product
prod_description	VARCHAR(150)	Description of product
prod_image_url	VARCHAR(255)	URL for product image

- **Retailer Table**

Name	Data Type	Description
retail_ID(PK)	INT	Unique identifier for the retailer
retail_name	VARCHAR(255)	Name of the retailer
retail_region	VARCHAR(100)	Region of the retailer
retail_state	VARCHAR(100)	State of the retailer
retail_city	VARCHAR(100)	City of the retailer
retail_salesMethod	VARCHAR(50)	Sale method use

- **Store Table**

Name	Data Type	Description
retail_ID (PK, FK)	INT	Unique identifier for retailer
prod_SKU (PK, FK)	VARCHAR(6)	Identify each product
amount	INT	Amount of products stored in the retailer

- **Customer Table**

Name	Data Type	Description
cus_citizenID PK)	INT	Unique identifier for customer
cus_fullname	VARCHAR(255)	Name of customer
cus_age	INT	Age of customer
cus_gender	VARCHAR(6)	Customer's gender
cus_email	VARCHAR(255)	Customer's email address
cus_phone	VARCHAR(15)	Customer's contact number
cus_address	VARCHAR(255)	Address of the customer
cus_registration_date	VARCHAR(255)	Date of the customer registered
cus_loyaltyPoints	INT	Loyalty point earned by the customer

- **Have Table**

Name	Data Type	Description
pur_ID (PK, FK)	CHAR(8)	Unique identifier for each purchase transaction
prod_SKU (PK, FK)	CHAR(6)	Unique identifier for each product
quantity	INT	Quantity of product in the purchase

- **Staff Table**

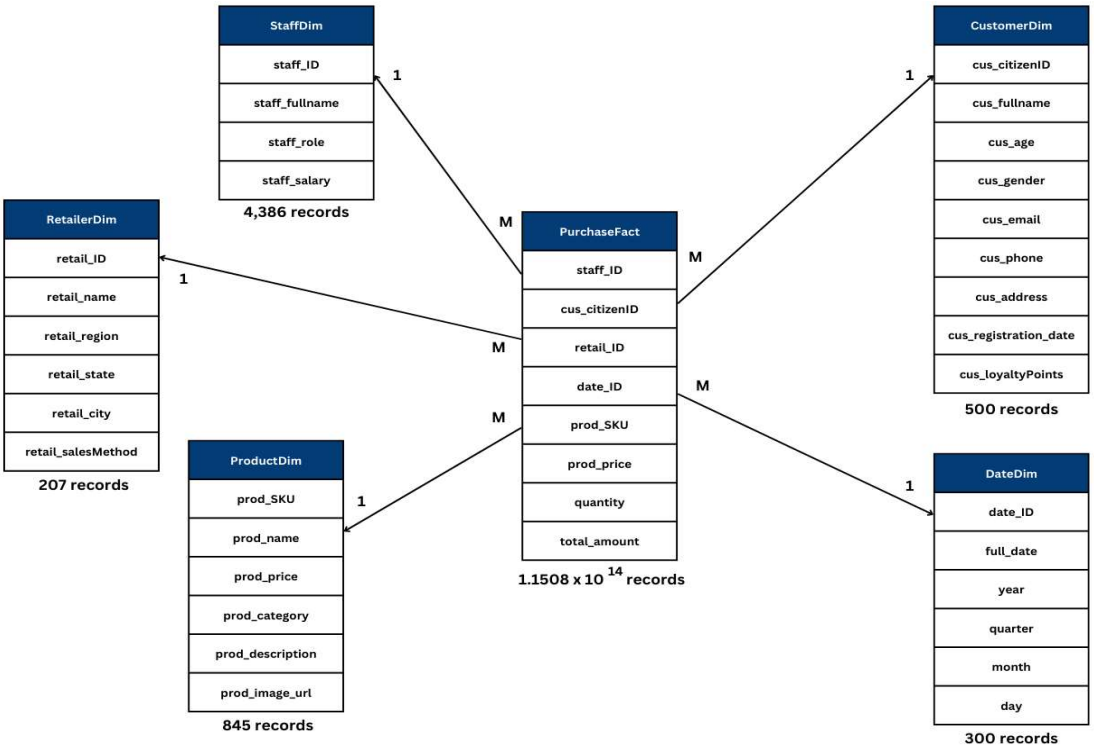
Name	Data Type	Description
staff_id (PK)	INT	Unique identifier for staff
staff_fullname	VARCHAR(255)	Name of staff
staff_role	VARCHAR(50)	Role of the staff member
staff_gender	VARCHAR(6)	Staff's gender
staff_age	INT	Age of staff
staff_salary	INT	Salary of staff
staff_email	VARCHAR(255)	Staff's email address
staff_phone	VARCHAR(15)	Staff's contact number
staff_hireDate	VARCHAR(50)	Date the staff member was hired
retail_ID (FK)	INT	Unique identifier for retailer

- **Purchase Table**

Name	Data Type	Description
pur_ID (PK)	CHAR(8)	Unique identifier for each purchase transaction
pur_date	VARCHAR(255)	The date when the purchase was made
pur_status	VARCHAR(9)	Current status of purchase order
cus_citizenID	INT	Reference to the customer who made the purchase
staff_ID (FK)	INT	Unique identifier for staff

3. Data Warehouse Design - OLAP

3.1 PurchaseFact (Customer Purchase Behavior Cube)

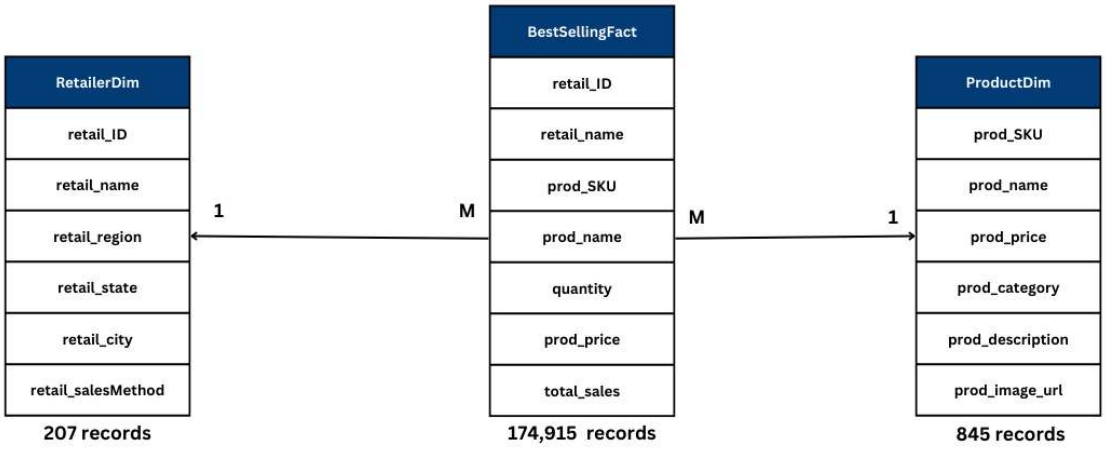


Total size = 9.2061 x 10^14

- **Purpose:** This cube tracks individual customer purchases, including "who bought what, from which retailer, when, and in what quantity". It provides insights into customer buying behavior, purchase trends, and product preferences.
- **Business Relevance:**
    - **Customer Segmentation:** Identify high-value customers based on purchase history and loyalty points.
    - **Personalized Marketing:** Target customers with promotions based on past purchases.
    - **Inventory Optimization:** Understand product demand to manage stock levels efficiently.
    - **Sales Performance Tracking:** Analyze customer trends over different time periods to adjust sales strategies.
    - **Loyalty Program Insights:** Evaluate how effective loyalty points are in influencing repeat purchases.

- **Fact Attributes:**
  - `staff_ID` → FK to StaffDim
  - `cus_citizenID` → FK to CustomerDim
  - `retail_ID` → FK to RetailerDim
  - `date_ID` → FK to DateDim
  - `prod_SKU` → FK to ProductDim
  - `prod_price` → Price of each product purchased
  - `quantity` → Number of products purchased
  - `total_amount` → Sum of purchase price
- **Measures:**
  - `total_amount`: Total spending per customer (`total_amount = quantity × prod_price`)
- **Dimension Tables**
  - **StaffDim** (`staff_ID, staff_fullname, staff_role, staff_age, staff_salary, staff_email, staff_phone, staff_hireDate, staff_gender, retail_ID`)
  - **RetailerDim** (`retail_ID, retail_name, reatil_region, retail_state, retail_city, retail_salesMethod`)
  - **ProductDim** (`prod_SKU, prod_name, prod_price, prod_category, prod_description, prod_image_url`)
  - **CustomerDim** (`cus_citizen_ID, cus_fullname, cus_age, cus_gender, cus_email, cus_phone, cus_address, cus_registration_date, cus_loyaltyPoints`)
  - **DateDim** (`date_ID,year, quarter, month, day`)

3.2 BestSellingFact (Top-Selling Products Cube)

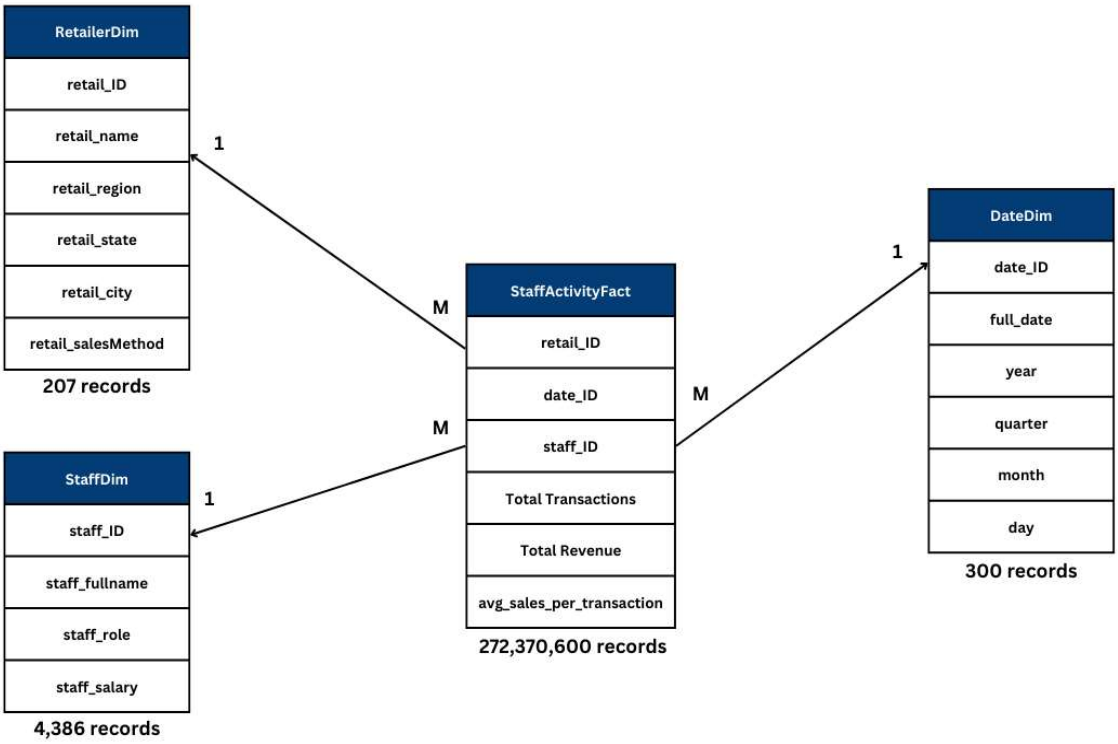


Total size = 1,224,405

- **Purpose:** This cube tracks the best-selling products, providing insights into product popularity, sales volume, and revenue generation. It helps businesses understand which products drive the most sales and optimize inventory, pricing, and marketing strategies accordingly.
- **Business Relevance:**
  - **Product Performance Analysis:** Identify the highest-selling products based on quantity and revenue.
  - **Demand Forecasting:** Predict future sales trends to optimize stock levels.
  - **Revenue Insights:** Assess how product pricing impacts overall sales performance.
  - **Marketing Strategy Optimization:** Target promotions for top-selling products to maximize profits.
  - **Sales Growth Analysis:** Track sales trends over time to inform business decisions.
- **Fact Attributes:**
  - `retail_ID` → FK to RetailerDim
  - `retail_name` → Name of the retailer
  - `prod_SKU` → FK to ProductDim
  - `prod_name` → Name of product
  - `quantity` → Number of products purchased
  - `prod_price` → Price of product
  - `total_sales` → Total revenue generated from product sales

- **Measures:**
  - `total_sales`: Total revenue per product (`total_sales = quantity × prod_price`)
- **Dimension Tables**
  - **RetailerDim** (`retail_ID, retail_name, reatil_region, retail_state, retail_city, retail_salesMethod`)
  - **ProductDim** (`prod_SKU, prod_name, prod_price, prod_category, prod_description, prod_image_url`)

3.3 StaffPerformanceFact (Staff Productivity Cube)



Total size = 1,634,223,600

- **Purpose:** This fact table evaluates staff performance by tracking their sales contributions, customer interactions, and overall productivity. It helps businesses optimize workforce management, improve customer service, and design effective incentive programs.
- **Business Relevance:**
  - **Identify High-Performing Staff** – Recognize top employees based on sales.
  - **Incentives & Bonus Programs** – Reward employees based on performance.
  - **Optimize Workforce Management** – Adjust staffing based on productivity.
  - **Customer Service Insights** – Understand how staff influence customer retention.
- **Fact Table:**
  - `retail_ID` → FK to RetailerDim
  - `date_ID` → FK to DateDim
  - `staff_ID` → FK to StaffDim
  - `Total Transactions` → Number of purchases handled by staff
  - `Total Revenue` → Total revenue generated by staff
  - `avg_sales_per_transaction` → Average revenue per transaction
- **Measures:**
  - `Total Transactions` → `COUNT(pur_ID)`

    - Total Revenue → SUM(total_amount)
    - Avg_sales_per_transaction → total_sales / total_transactions
- **Dimension Tables:**
    - **StaffDim** (staff_ID, staff_fullname, staff_role, staff_age, staff_salary, staff_email, staff_phone, staff_hireDate, staff_gender, retail_ID)
    - **RetailerDim** (retail_ID, retail_name, retail_region, retail_state, retail_city, retail_salesMethod)
    - **DateDim** (date_ID,year, quarter, month, day)

4. ETL Process

4.1 Mapping Between OLTP and OLAP

OLTP Table	OLTP Column	Mapped OLAP Table	OLAP Column	Transformation
Product	prod_SKU	**ProductDim**	prod_SKU	Direct Mapping
	prod_name		prod_name	Direct Mapping
	prod_price		prod_price	Direct Mapping
	prod_category		prod_category	Direct Mapping
	prod_description		prod_description	Direct Mapping
	prod_image_url		prod_image_url	Direct Mapping
Retailer	retail_id	**RetailerDim**	retail_id	Direct Mapping
	retail_name		retail_name	Direct Mapping
	retail_region		retail_region	Direct Mapping
	retail_state		retail_state	Direct Mapping
	retail_city		retail_city	Direct Mapping
	retail_salesMethod		retail_salesMethod	Direct Mapping
Customer	cus_citizenID	**CustomerDim**	cus_citizen_ID	Direct Mapping
	cus_fullname		cus_fullname	Direct Mapping
	cus_age		cus_age	Direct Mapping
	cus_gender		cus_gender	Direct Mapping
	cus_email		cus_email	Direct Mapping
	cus_phone		cus_phone	Direct Mapping
	cus_address		cus_address	Direct Mapping

	cus_registration_date		cus_registration_date	Direct Mapping
	cus_loyaltyPoints		cus_loyaltyPoints	Direct Mapping
Purchase	pur_ID	**PurchaseFact**	pur_ID	Direct Mapping
	pur_date	**DateDim**	date_ID	Date transformation (YYYY-MM-DD → date_ID)
	cus_citizenID	**PurchaseFact**	cus_citizenID	Direct Mapping
	staff_ID		staff_ID	Direct Mapping
	retail_ID		retail_ID	Direct Mapping
Have	pur_ID	**PurchaseFact**	pur_ID	Join with Purchase Table
	prod_SKU		prod_SKU	Join with Product Table
	quantity		quantity	Direct Mapping
Store	prod_SKU, retail_ID	**RetailerSalesFact**	prod_SKU, retail_ID	Aggregate total sales
Staff	staff_ID	**StaffDim**	staff_ID	Direct Mapping
	staff_fullname		staff_fullname	Direct Mapping
	staff_role		staff_role	Direct Mapping
	staff_age		staff_age	Direct Mapping
	staff_salary		staff_salary	Direct Mapping
	staff_email		staff_email	Direct Mapping
	staff_phone		staff_phone	Direct Mapping
	staff_hireDate		staff_hireDate	Direct Mapping

	retail_ID		retail_ID	Direct Mapping

Date Dimension Extraction

Since there is **no dedicated Date table in OLTP**, we extract it from `pur_date` in the **Purchase** table. We break `pur_date` into:

- `date_ID (PK)`
- `full_date`
- `year`
- `quarter`
- `month`
- `day`

4.2 ETL Process using Tableau Prep

We will now extract data from OLTP, transform it into the required OLAP schema, and load it into the data warehouse.

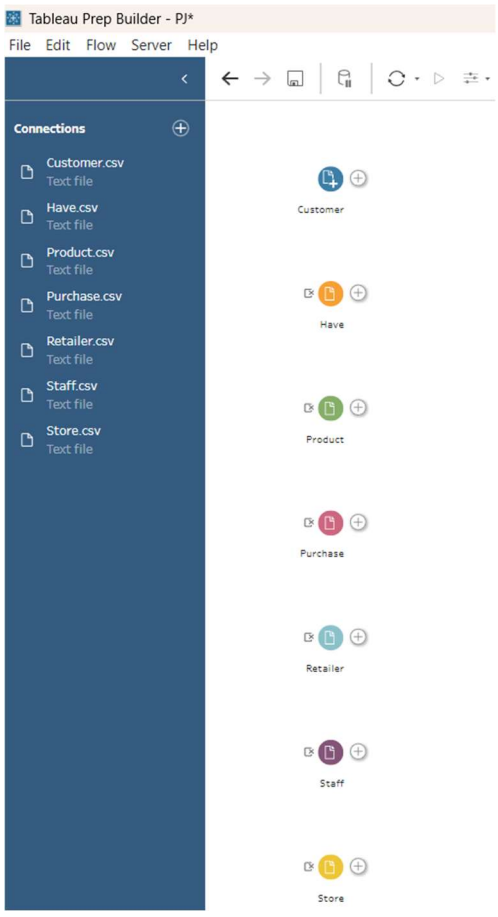
1. Extract (E) - Data Collection

In this step, we extract data from OLTP sources and load it into Tableau Prep for processing.

Steps:

1. Open **Tableau Prep Builder**.
2. Connect to the data source (e.g., Excel, CSV, or a database) containing OLTP tables.
3. Load the following tables into the Tableau Prep flow:
   - Product, Retailer, Store, Customer, Staff, Purchase, and Have.
4. Drag and drop all tables into the **Flow pane**.
5. Since there is no dedicated **Date** table in OLTP, we extract pur_date from the **Purchase** table to create a **Date Dimension**.

Example Screenshot: Importing OLTP tables:



2. Transform (T) - Data Cleaning and Structuring

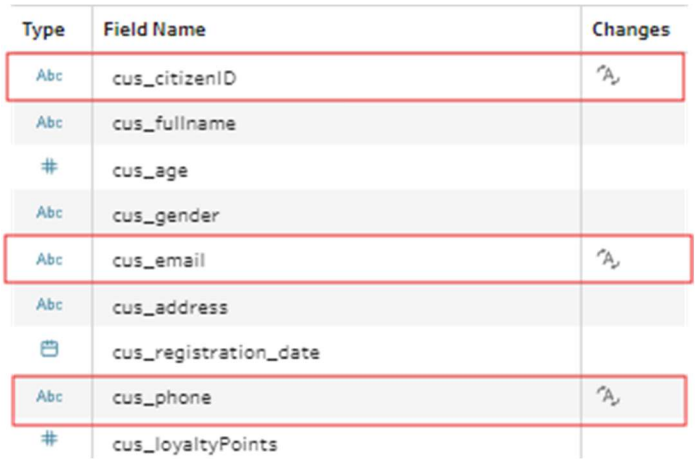
This stage ensures data is cleaned, formatted correctly, and structured to fit the OLAP schema.

2.1 Processing Dimension Tables

Each dimension table is structured to remove inconsistencies and ensure uniqueness.

2.1.1 Customer Dimension (CustomerDim)

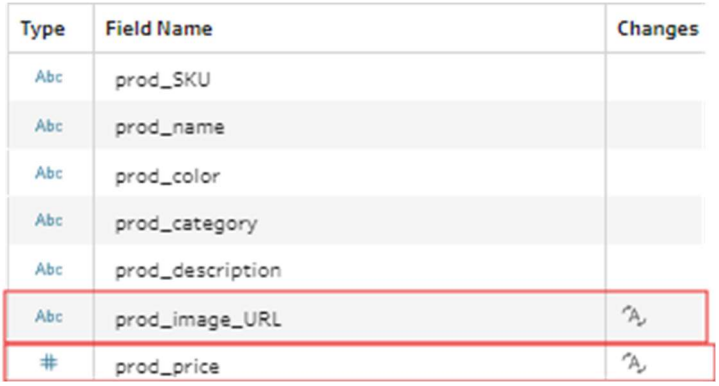
- **Data Cleaning:**
  - Change `cus_citizenID` → **Integer to String**.
  - Change `cus_email` → **String to Email**.
  - Change `cus_phone` → **Integer to String**.
- **Ensure Uniqueness:**
  - Aggregate on `cus_citizenID`.
- **Output:** `CustomerDim`.



Type	Field Name	Changes
Abc	cus_citizenID	
Abc	cus_fullname	
#	cus_age	
Abc	cus_gender	
Abc	cus_email	
Abc	cus_address	
	cus_registration_date	
Abc	cus_phone	
#	cus_loyaltyPoints	

2.1.2 Product Dimension (ProductDim)

- **Data Cleaning:**
  - Change `prod_image_URL` → **String to URL**.
- **Ensure Uniqueness:**
  - Aggregate on `prod_SKU`.
- **Output:** `ProductDim`.



Type	Field Name	Changes
Abc	prod_SKU	
Abc	prod_name	
Abc	prod_color	
Abc	prod_category	
Abc	prod_description	
Abc	prod_image_URL	
#	prod_price	

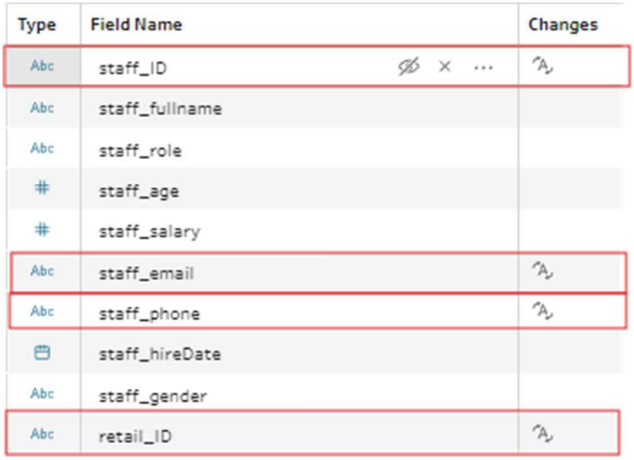
2.1.3 Retailer Dimension (RetailerDim)

- **Data Cleaning:**
  - Change `retail_ID` → **Integer to String**.
- **Ensure Uniqueness:**
  - Aggregate on `retail_ID`.
- **Output:** `RetailerDim`.

Type	Field Name	Changes
Abc	retail_ID	
Abc	retail_name	
Abc	retail_region	
Abc	retail_state	
Abc	retail_city	
Abc	retail_salesMethod	

2.1.4 Staff Dimension (StaffDim)

- **Data Cleaning:**
  - Change `staff_ID` → **Integer to String**.
  - Change `staff_salary` → **Integer to String**.
  - Change `staff_email` → **String to Email**.
  - Change `staff_phone` → **Integer to String**.
- **Ensure Uniqueness:**
  - Aggregate on `staff_ID`.
- **Output:** `StaffDim`.



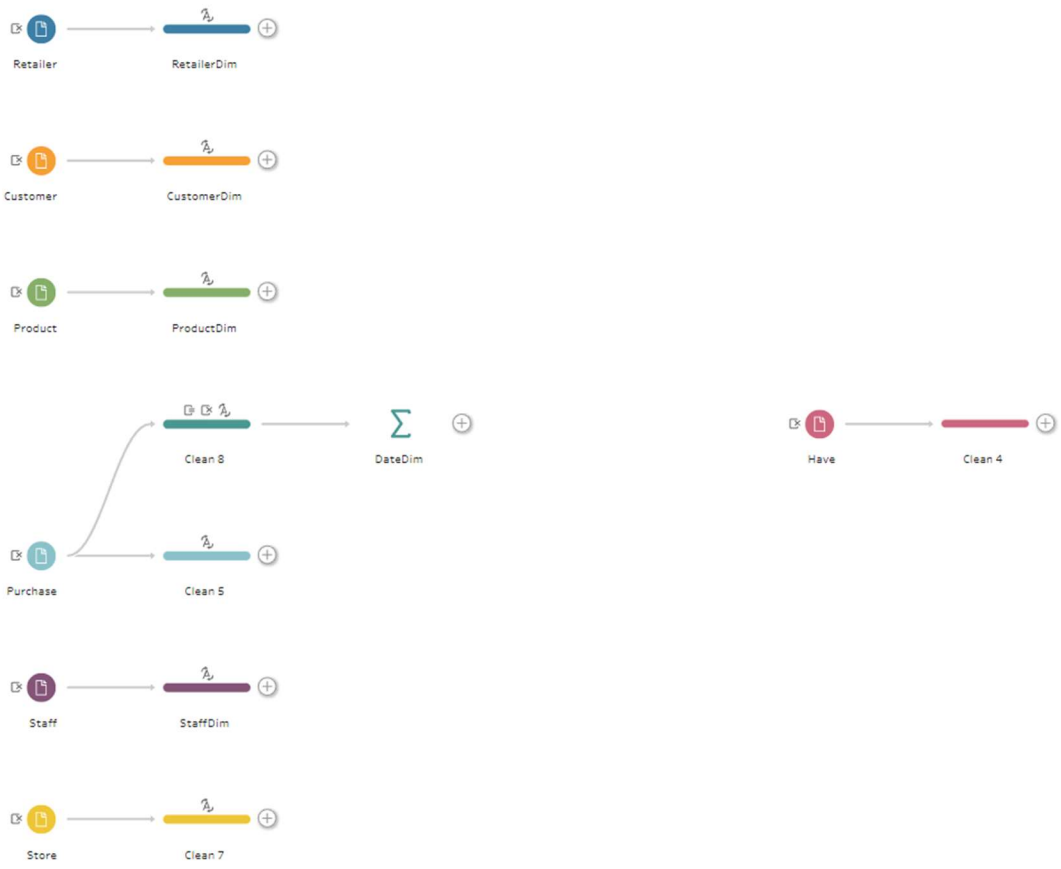
Type	Field Name	Changes
Abc	staff_ID	
Abc	staff_fullname	
Abc	staff_role	
#	staff_age	
#	staff_salary	
Abc	staff_email	
Abc	staff_phone	
	staff_hireDate	
Abc	staff_gender	
Abc	retail_ID	

2.1.5 Date Dimension (DateDim)

Since there is no dedicated `Date` table, we extract `pur_date` from `Purchase`.

- **Extract Unique Dates:**
  - Identify unique `pur_date` values.
- **Generate Date Attributes:**
  - `date_ID` (PK) → **Generated as YYYYMMDD format**.
  - `year, quarter, month, day`.
- **Output:** `DateDim`.

Type	Group Type	Field Name	Changes
Abc	GROUP	date_ID	
Abc	GROUP	Year	
#	GROUP	Quarter	
#	GROUP	Month	
#	GROUP	Day	

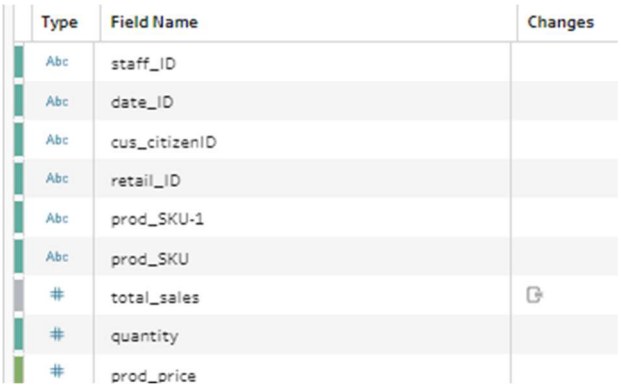

Retailer
RetailerDim
Customer
CustomerDim
Product
ProductDim
Clean 8
DateDim
Purchase
Clean 5
Staff
StaffDim
Store
Clean 7
Have
Clean 4

2.2 Processing Fact Tables

Fact tables store transactional data, which is aggregated and structured for analysis.

2.2.1 Purchase Fact Table (PurchaseFact)

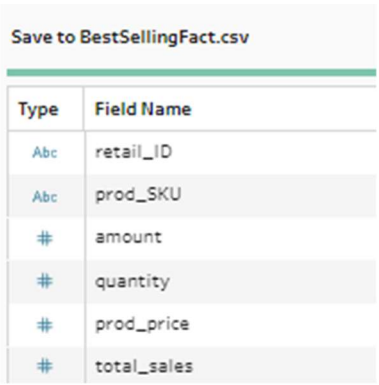
- **Join Tables:**
  - `Purchase` JOIN `Have` on `pur_ID`.
  - **Select Relevant Columns:**
  - `cus_citizenID, retail_ID, pur_date, staff_ID, prod_SKU, quantity, total_amount` (calculated as `quantity * prod_price`).
- **Output**: `PurchaseFact`.



Type	Field Name	Changes
Abc	staff_ID	
Abc	date_ID	
Abc	cus_citizenID	
Abc	retail_ID	
Abc	prod_SKU-1	
Abc	prod_SKU	
#	total_sales	
#	quantity	
#	prod_price	

2.2.2 Best Selling Fact Table (BestSellingFact)

- **Aggregate Data:**
  - Group by `retail_ID, prod_SKU, pur_date`.
  - Calculate `total_sales = SUM(amount * prod_price)`.
- **Select Relevant Columns:**
  - `retail_ID, pur_date, prod_SKU, total_sales`.
- **Output:** `RetailerSalesFact`.



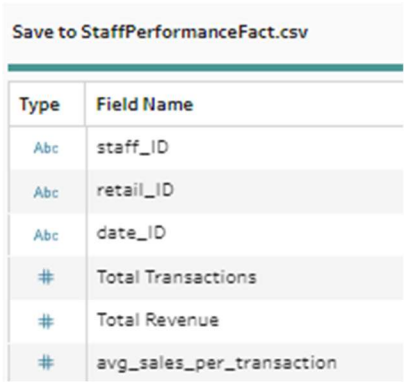
Save to BestSellingFact.csv

Type	Field Name
Abc	retail_ID
Abc	prod_SKU
#	amount
#	quantity
#	prod_price
#	total_sales

2.2.3 Staff Performance Fact Table (StaffPerformanceFact)

- **Aggregate Data:**
  - Group by `staff_ID, pur_date`.
  - **Calculate:**
    - `total_transactions = COUNT(pur_ID)`.
    - `total_sales = SUM(total_amount)`.
    - `avg_sales_per_transaction = total_sales / total_transactions`.
- **Select Relevant Columns:**
  - `staff_ID, retail_ID, pur_date,total_transactions, total_sales, avg_sales_per_transaction`.

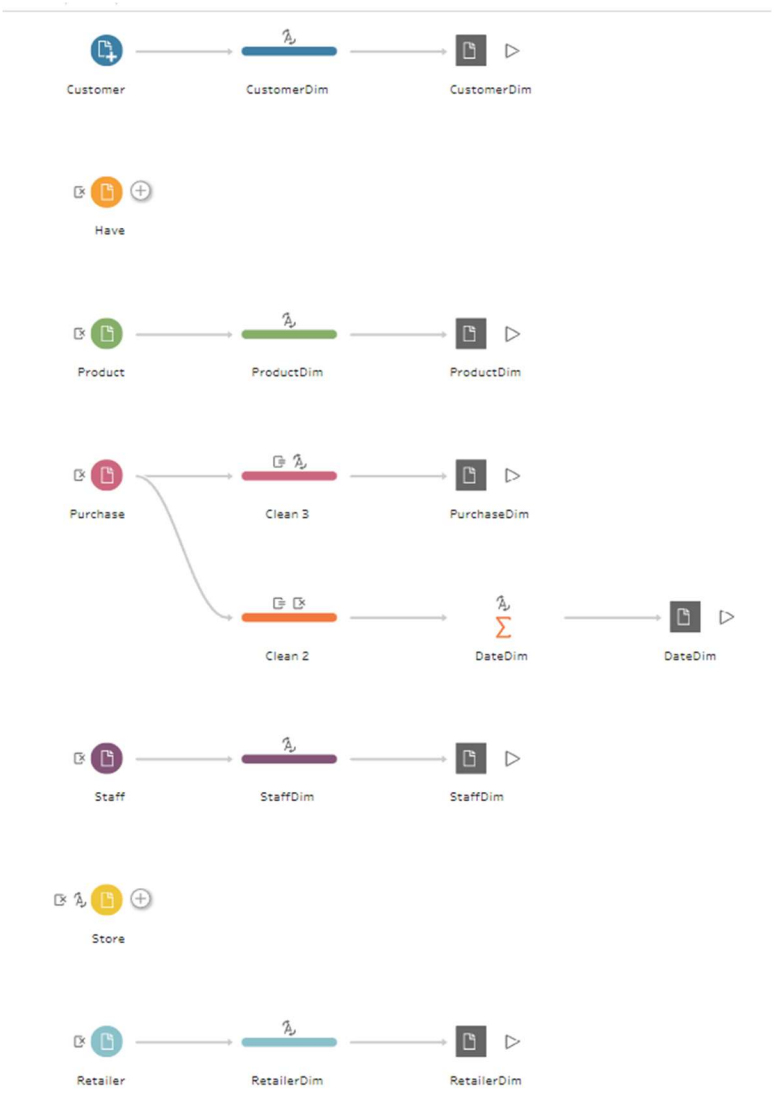
Output: `StaffPerformanceFact`.



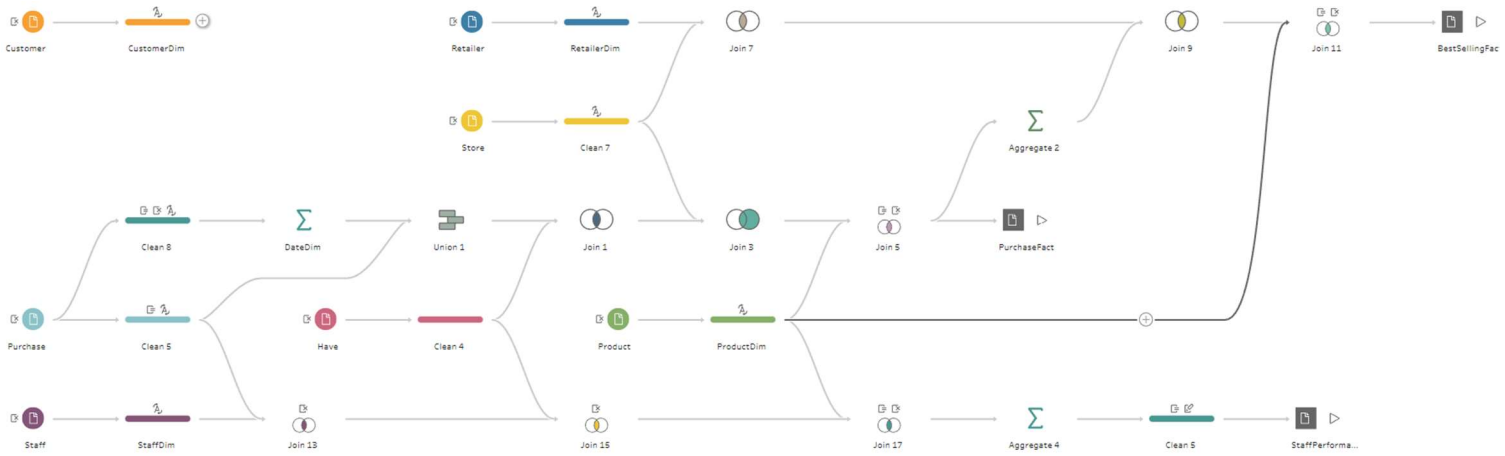
3. Load (L) - Data Warehouse Population

Once the data is structured and transformed, we **load it into the OLAP data warehouse** for business intelligence purposes.

- **Target Database:** PostgreSQL / MySQL (Star Schema).
- **Stored Tables:**
    - **Dimension Tables:** `CustomerDim, ProductDim, RetailerDim, StaffDim, DateDim.`

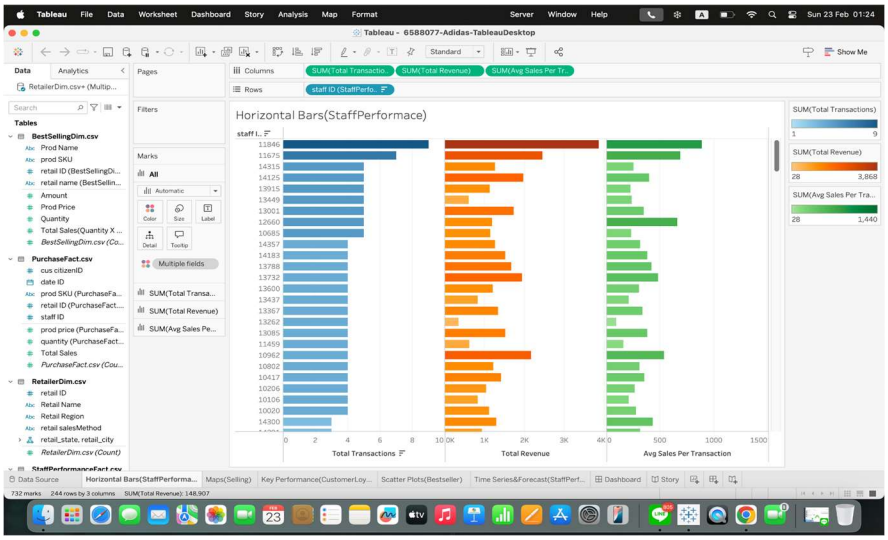


- **Fact Tables:** `PurchaseFact, RetailerSalesFact, StaffPerformanceFact.`



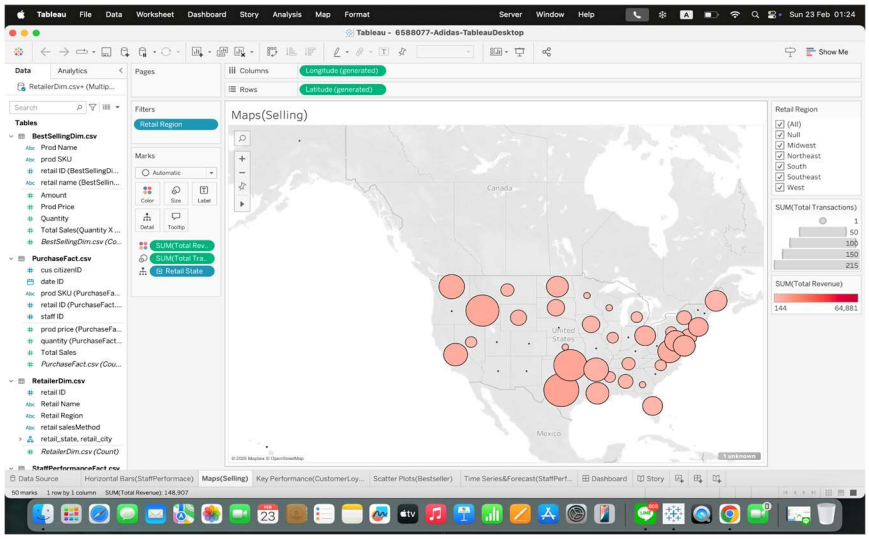
5. Analysis and Visualization Reports

Horizontal Bars (Analysis Staff performance):



This graph explains the staff performance of Adidas by using total transaction, revenue, and average sales per transaction. Total transaction refers to the number of orders that each member of staff completes, the total revenue refers to the total income from the total order that each member of staff completes, and the avg sales per transaction refers to the average number of transactions that each staff completes. Therefore, the staff of Adidas who receive the highest total transaction, revenue, and average sales per transaction will have the best performance.

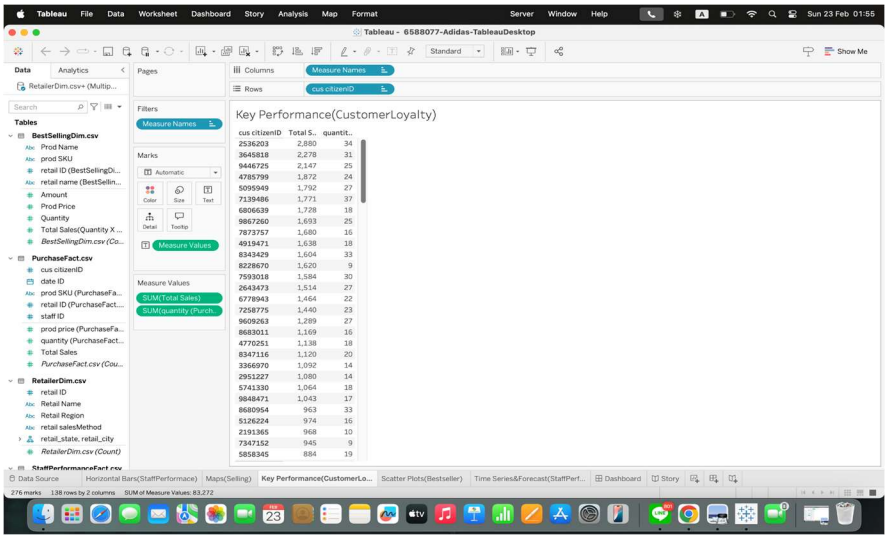
Maps (Analysis the sale volume)



This map shows that the state which has a big circle will have the highest sales volume. This map is created by a total transaction that staff created. If the staff of each state can create a huge

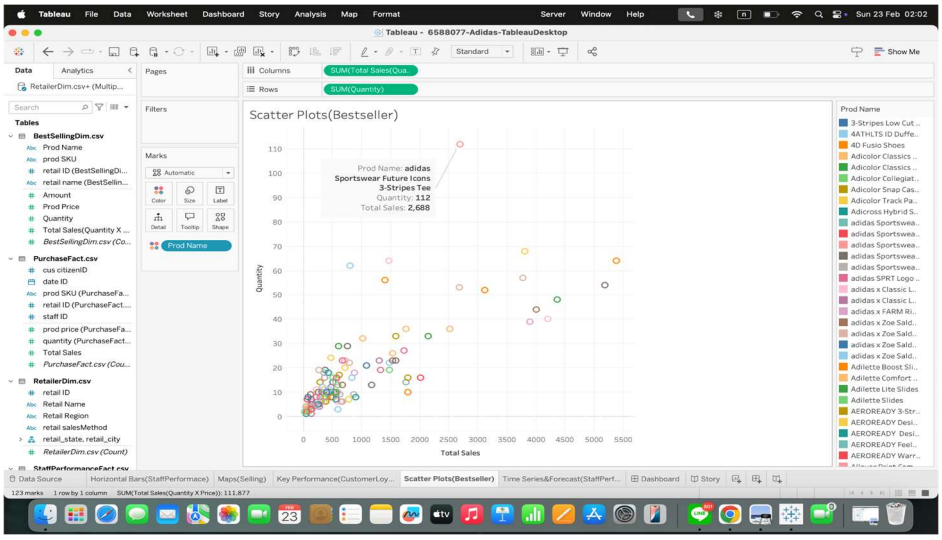
number of transactions, the state that receives the highest number of transactions will have the highest sales volume.

Key Performance indicator(Analysis customer loyalty)



This key performance indicator shows the total sales that refer to the money that customers spend for buying adidas products, and quantities that refer to the number of products that customers buy from adidas. Therefore, the customer who has the highest both of the total sales and quantities will be the best loyalty of Adidas.

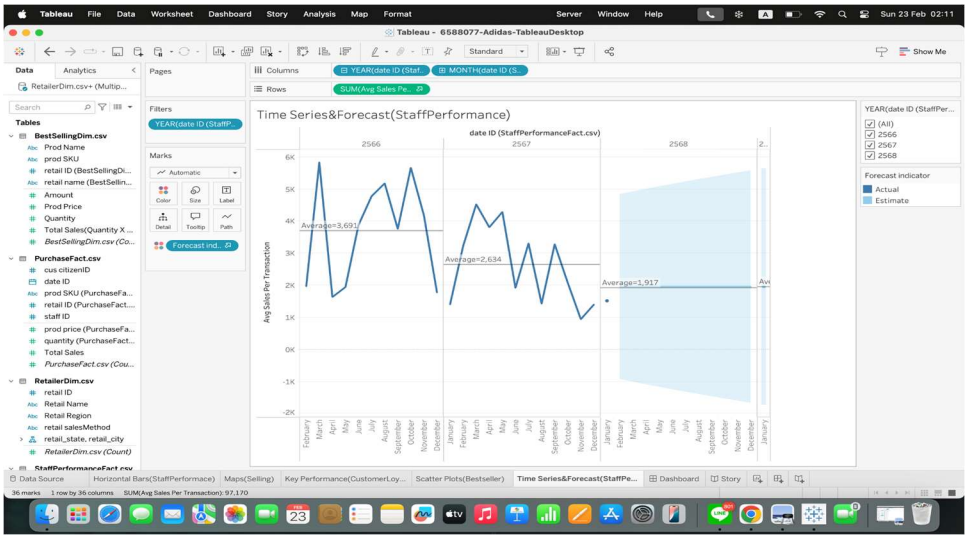
Scatter Plots (Analysis of the best seller product)



This scatter plot shows the best seller product of adidas company. The y-axis represents the quantity of products that are sold to the customers. The x-axis represents the total amount of the products that are sold to the customers as total sales. Therefore, the highest plot which is adidas

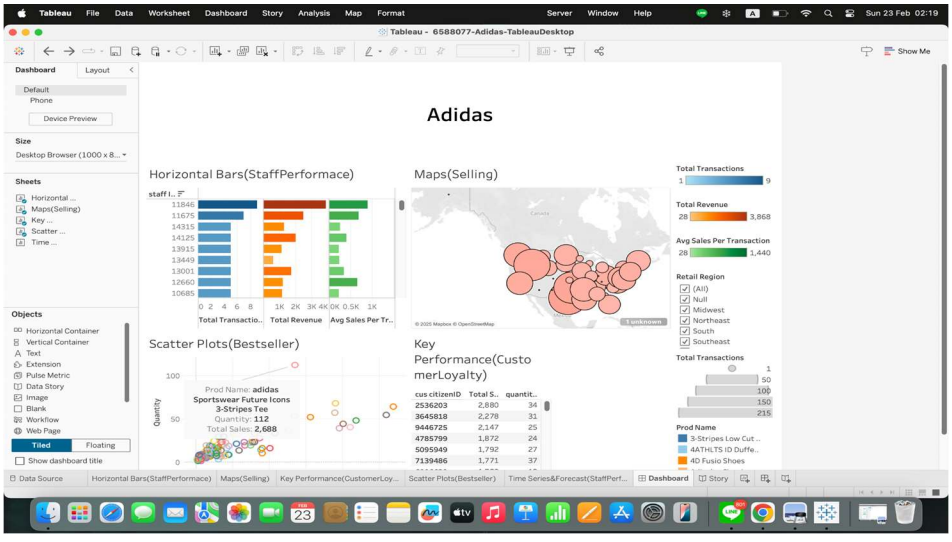
sportswear future icons 3-stripes tee is the best seller product with the 112 quantity and 2688 total sales.

Time Series & Forecast (Predict staff performance)



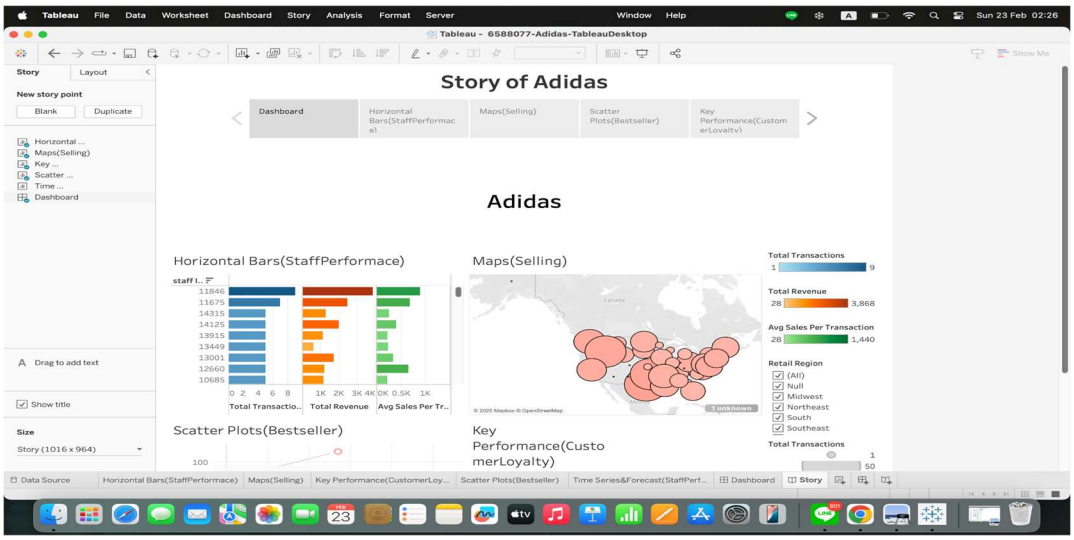
This Time Series & Forecast graph is for predicting the staff performance in 2568 by using the average sales per transaction. Therefore, the graph shows that in 2568 the staff performance will decrease, and it will directly affect the sales volume of Adidas.

Dashboard (Show the important graph)



This dashboard provides horizontal bars, maps, scatter plots, and key performance indicators. These four visualizations are important to improve the performance of Adidas. It shows which staff has a good performance, what area has a good sales volume, which product is the best seller, and which customer has a good relationship with the company.

Story (Expand the details of dashboard)



This story provides a dashboard, horizontal bars, maps, scatter plots, and key performance indicators. The company will see the overview from the dashboard in the first story. Then, the company can dig deep into each graph by selecting the rest of the story.

Video Demonstration

- 12 minutes VDO Clip demonstration on how to use Tableau Prep and Tableau Desktop:

https://drive.google.com/file/d/1VJBcvVfgSDJePbx2HRJ66bZfEuD8xP0g/view?usp=sharing

6. Discussion and Conclusion

The operational performance and executive decision-making of Adidas was delayed due to the difficulty of managing a lifetime's worth of data across multiple systems. However, the implementation of a BI system along with a data warehouse UI solved those issues. Adidas was able to centralize data from different platforms for easier data management, enhanced data accuracy, and stakeholder accessibility by streamlining data management.

Although the corporation had many fragments of information, with the data warehouse, Adidas was able to pull other important business pieces together from sales, supply chain, and customer reviews. This assisted in delivering detailed and accurate reports in a timely manner, improving mid-marketing and operational decisions. For example, through the modern integration of ERP, real-time analysis of sales trends, control of inventory levels, and rapid reaction to the market was possible. Also, analytics, dashboards, and other visualizations such as Self-service Business Intelligence solutions eliminated the dependency on IT further fostering a data-driven culture.

The overall assistance was great for Adidas as a company. As previously mentioned, the executives and managers of the company can now access accurate, updated information at any given time, allowing them to make more informed, well-educated strategic decisions. Operational effectiveness was also enhanced as processes that were repetitive in nature on data extraction were streamlined which made reporting more effective. Moreover, analyzing a consumer's behavioral patterns and preferences helped Adidas focus on marketing allowing the company to increase revenues while satisfying customers more.

In conclusion, integrating BI tools and data warehouses changed the approach of Adidas towards data management and analytics. With the fragmentation and inefficiencies in the data, Adidas was able to internally improve its processes while gaining an advantage over competitors in the global market. This case illustrates the ability of advanced data solutions to unlock business challenges and the long-term importance of success.

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