

# Workshop

- AdventureWorksDW
- Microsoft SQL Server
- Microsoft Power BI
- Tableau



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# Sample Databases

## AdventureWorks201x & AdventureWorksDW201x

- AdventureWorks sells bikes & related products (parts & accessories) through two sales channels:
  - direct to customers via internet
  - indirectly through resellers (or stores)
- Business transactions tracked are: sales, purchases & inventory.
- These transactions may have some of the following dimensions:
  - Products sold or purchased - Product Hierarchy – Products, Product Subcategories & Product Categories
  - Address for customer, employees, stores & others - Geography Hierarchy – City, State, Country
  - Resellers (or Store)
  - Customers (Individuals buying over the internet)
  - Ship, Order, Due, Purchase & other Dates - Date Hierarchy - Year, Quarter, Month, Day
  - Employees – including sales people
  - Vendors – product and part suppliers
  - Sales promotions



# Sample Databases

## AdventureWorks201x & AdventureWorksDW201x

- AdventureWorks201x
  - OLTP (on-line transactional processing) database
  - **System of record (SOR)** for AdventureWorks company
  - Normalized ER Model
- AdventureWorksDW201x
  - **Data Warehouse (DW)**
  - Data source is AdventureWorks201x (sort of...)
  - Dimensional data model

# Sample Databases

## AdventureWorks201x & AdventureWorksDW201x

- Microsoft's documentation has not been kept up-to-date (similar to most IT's BI & DW documentation BTW) but is useful when understanding the overall model and business rules:
  - [Schemas in AdventureWorks](#)
  - [AdventureWorks Data Dictionary](#)
  - [Adventure Works Cycles Business Scenarios](#)
- Additional documentation
  - [AdventureWorks – Data Dictionary](#) – by Datedo (sells data dictionary software & ERD)
  - [AdventureWorks \(printer friendly\).pdf](#) - pdf of above
- AdventureWorks Data Model (both old)
  - [AdventureWorks OLTP Database Diagram](#)
  - [AdventureWorks DW Schema](#)

# Sample Databases

## AdventureWorks201x & AdventureWorksDW201x

- AdventureWorks201x
  - Sales
  - Inventory
  - Purchasing Sales
- AdventureWorksDW201x
  - Internet Sales
  - Reseller Sales
  - Inventory

# BI Workshop – Setting up for AdventureWorksDW

## Examples of data visualizations to answer questions

# BI Tools

## Best Practices – Using BI Tools

- Tutorials & demonstrations connect/import tables
- For consistency & ease of use basic tasks are done on tables:
  - Eliminating columns not used
  - Renaming columns
  - String manipulation
  - Calculations
- These basic tasks are simple but tedious & repetitive
- Relying on either IT or business person to implement consistently
- Visibility to changes in BI tool's metadata

# BI Tools

## Best Practices – Using BI Tools

- Use views rather than directly query tables
  - Perform “edits” of schema such as eliminate specific columns from load, rename columns, basic string manipulation & calculations in views
    - Productivity - Done once & used many times both by IT & business people
    - Consistency – for users & across BI tools
    - Performance - Reduces the data that needs to be loaded & that needs to be stored in memory for analysis
    - Transparency – can view “edits” in views rather than searching in each BI application
    - Skills – reduces dependency on scripting languages expertise, i.e. DAX, MDX
  - Trade-off – some BI tools use database constraints rather than column names to create data model relationships which means have to create relationships in BI tools’ data model
- Different views on the same underlying tables can be created for different people or business groups based on their needs



# BI Setup: AdventureWorksDW2017

## Views

Script: Create Views for BI - AdventureworksDW2017 qvw.sql on OneDrive for class folder: BI Workshops – SQL Scripts

- DimCurrency\_qvw
- DimCustomer\_qvw
- DimDate\_qvw
- DimEmployee\_qvw
- DimGeography\_qvw
- DimPromotion\_qvw
- DimReseller\_qvw
- DimSalesTerritory\_qvw
- FactInternetSales\_qvw
- FactResellerSales\_qvw

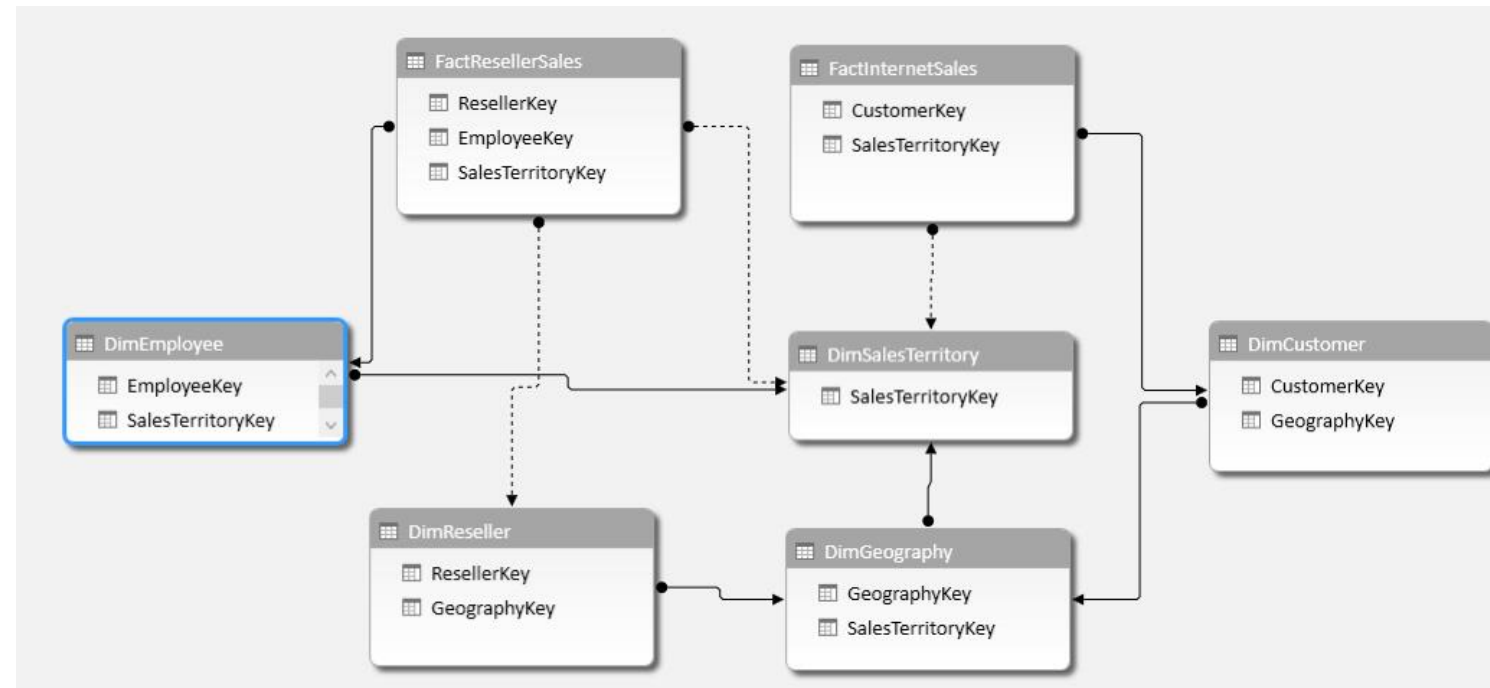
## Special Purpose Views

- Used for multiple dates in facts
  - DimDueDate\_qvw
  - DimShipDate\_qvw
  - DimOrderDate\_qvw
- Eliminated snowflake dimensions
  - DimProduct\_qvw
- Union of internet & reseller sales
  - FactTotalSales\_qvw
- Union of Customers & Resellers
  - DimSoldTo\_qvw

# BI Setup: AdventureWorksDW2017

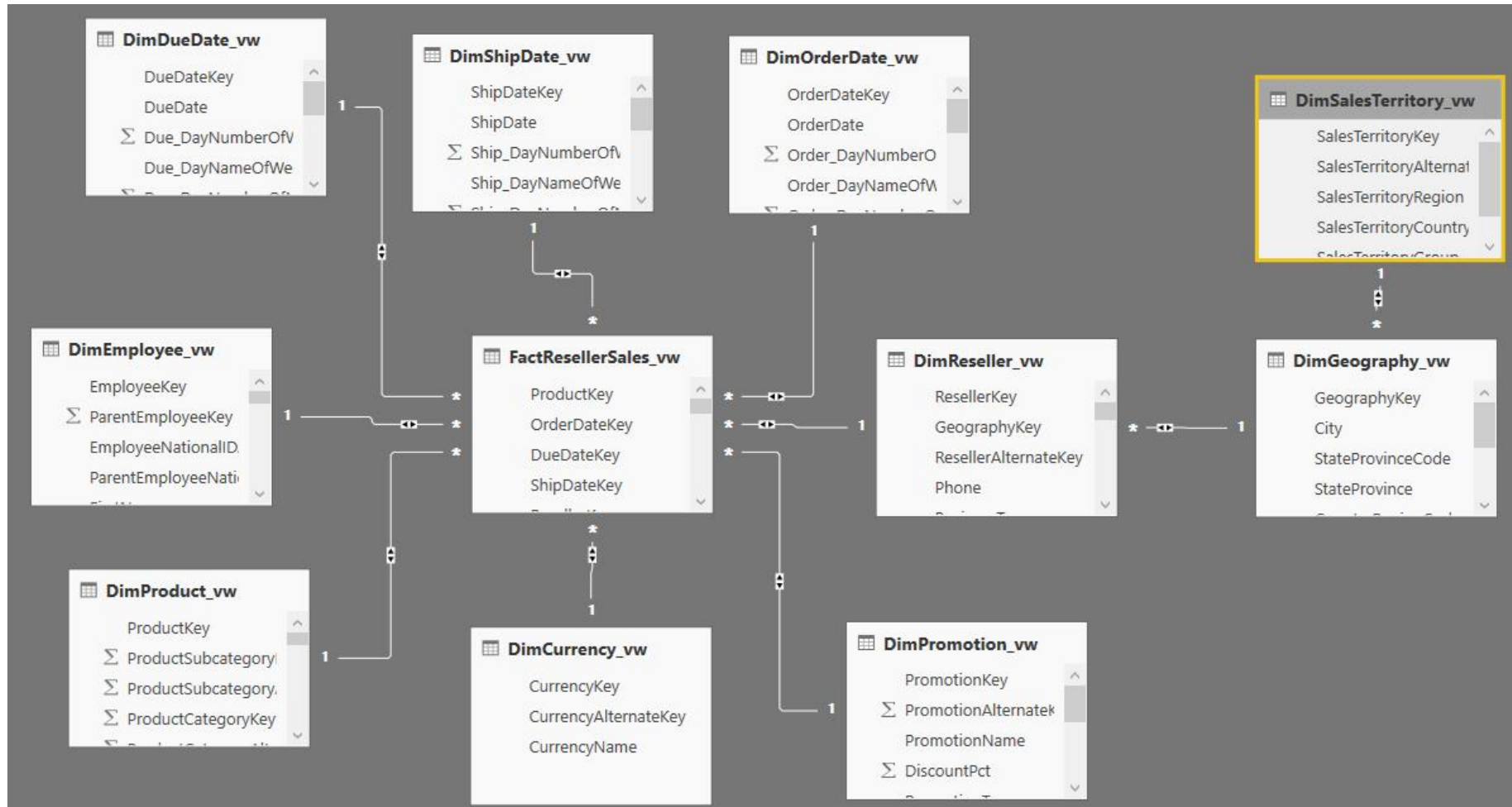
## Sales Data Model - Relationships

- Dimensions - Outrigger
  - Geo
  - Sales Territory
- Facts – Sales Territory
  - Internet Sales
  - Reseller Sales
- Dimensions - Geo
  - Customer
  - Reseller
  - Employee



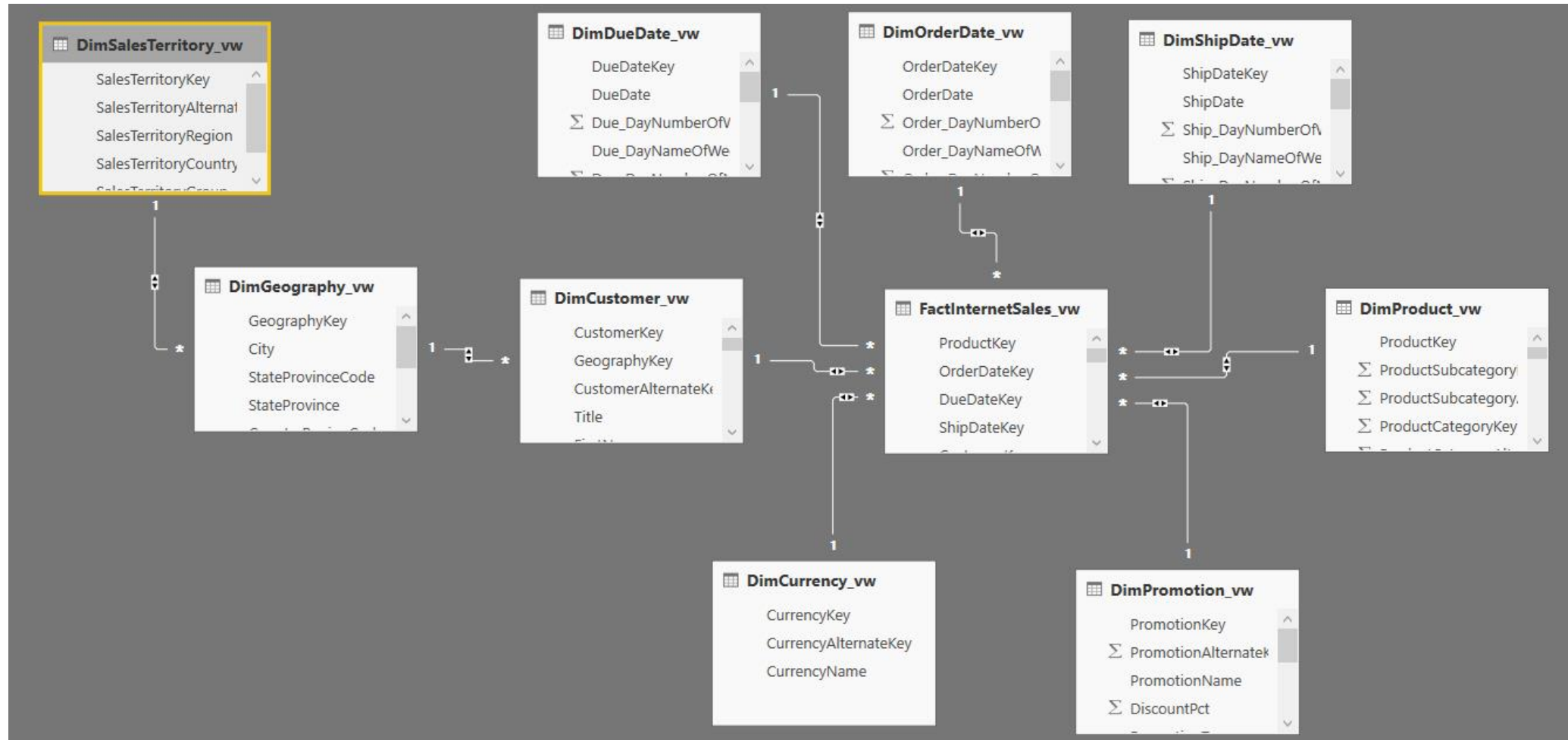
# BI Setup: AdventureWorksDW2017

## Reseller (Store) Sales



# BI Setup: AdventureWorksDW2017

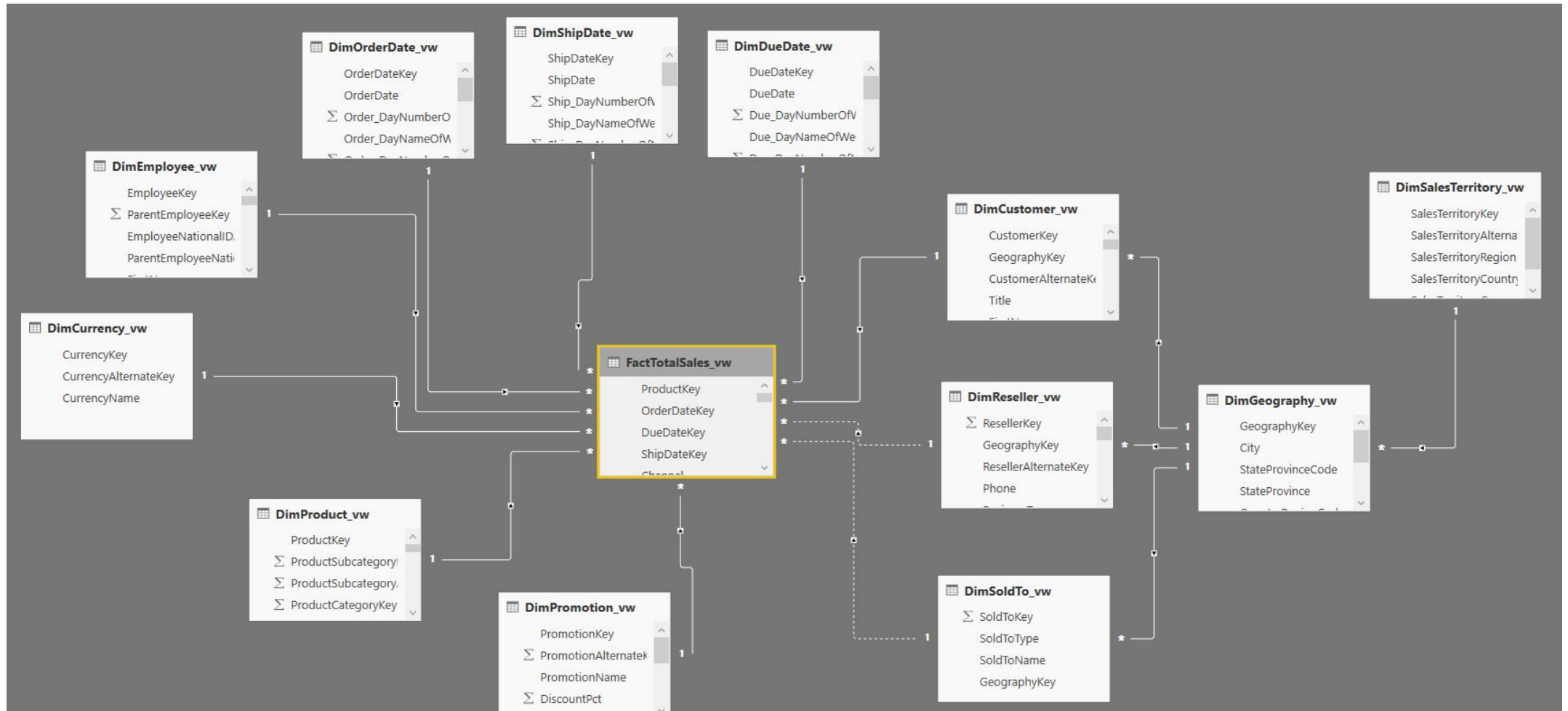
## Internet Sales



# BI Setup: AdventureWorksDW2017

## Total Sales

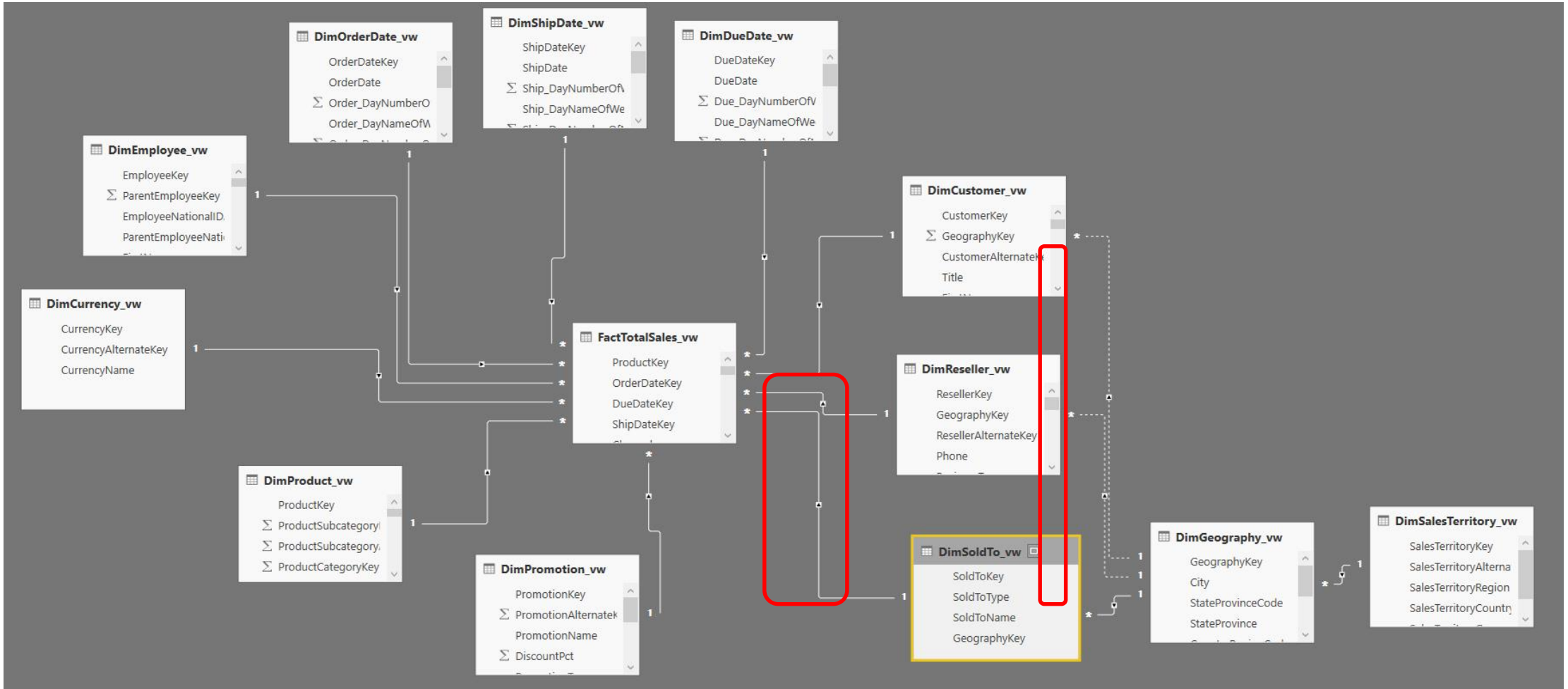
- Initial relationships (may vary based on BI tool)



# BI Setup: AdventureWorksDW2017

## Total Sales

- Revised relationships



# BI Workshop

## Business questions to answer

# Business questions to answer with visualizations

1. Product Contribution of Sales
2. Comparison of Yearly Sales
3. Sales Promotions & Discounts
4. Product Sales by Geography (city, state, country)
5. Product Profits by Sales Territory
6. Top 5 Sales People Ranked
7. Top 10 Resellers (Stores) Ranked
8. Geography-based Contribution to Sales
9. Two people-related attributes correlated to their sales
10. Any reseller attributes (at least one) correlated to their sales



# Deliverables

- Upload screenshots of each visualization
- Upload BI tools' dashboard file, i.e. pbix file for PBI or tbix for Tableau