

Workshop: Data Modeling with AdventureWorks

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BUSINESS INTELLIGENCE GUIDEBOOK

From Data Integration to Analytics

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Sample Databases - AdventureWorks

- 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: 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 - AdventureWorks

- AdventureWorks2017
 - OLTP (on-line transactional processing) database
 - **System of record (SOR)** for AdventureWorks company
 - Normalized ER Model
- AdventureWorksDW2017
 - **Data Warehouse (DW)**
 - Data source is AdventureWorks2017 (sort of...)
 - Dimensional data model

Sample Databases - AdventureWorks

- Microsoft's documentation has not been kept up-to-date (similar to most IT's BI & DW documentation BTW) but is useful when trying to understand 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](#)

AdventureWorks Databases

- AdventureWorks2017
 - Sales
 - Inventory
 - Purchasing Sales
- AdventureWorksDW2017
 - Internet Sales
 - Reseller Sales
 - Inventory

AdventureWorks2017

| dbName | SchemaName | TableName | Table_Rows | Sales | Inventory | Purchasing |
|--------------------|----------------|---------------------------|------------|-------|-----------|------------|
| AdventureWorks2017 | dbo | AWBuildVersion | 1 | | | |
| AdventureWorks2017 | dbo | DatabaseLog | 1,597 | | | |
| AdventureWorks2017 | dbo | ErrorLog | 0 | | | |
| AdventureWorks2017 | HumanResources | Department | 16 | | | |
| AdventureWorks2017 | HumanResources | Employee | 290 | | | |
| AdventureWorks2017 | HumanResources | EmployeeDepartmentHistory | 296 | | | |
| AdventureWorks2017 | HumanResources | EmployeePayHistory | 316 | | | |
| AdventureWorks2017 | HumanResources | JobCandidate | 13 | | | |
| AdventureWorks2017 | HumanResources | Shift | 3 | | | |
| AdventureWorks2017 | Person | Address | 19,614 | | | |
| AdventureWorks2017 | Person | AddressType | 6 | | | |
| AdventureWorks2017 | Person | BusinessEntity | 20,777 | | | |
| AdventureWorks2017 | Person | BusinessEntityAddress | 19,614 | | | |
| AdventureWorks2017 | Person | BusinessEntityContact | 909 | | | |
| AdventureWorks2017 | Person | ContactType | 20 | | | |
| AdventureWorks2017 | Person | CountryRegion | 238 | | | |
| AdventureWorks2017 | Person | EmailAddress | 19,972 | | | |
| AdventureWorks2017 | Person | Password | 19,972 | | | |
| AdventureWorks2017 | Person | Person | 19,972 | | | |
| AdventureWorks2017 | Person | PersonPhone | 19,972 | | | |
| AdventureWorks2017 | Person | PhoneNumberType | 3 | | | |
| AdventureWorks2017 | Person | StateProvince | 181 | | | |

AdventureWorks2017

| dbName | SchemaName | TableName | Table_Rows | Sales | Inventory | Purchasing |
|--------------------|------------|---------------------------------------|------------|-------|-----------|------------|
| AdventureWorks2017 | Production | BillOfMaterials | 2,679 | | | |
| AdventureWorks2017 | Production | Culture | 8 | | | |
| AdventureWorks2017 | Production | Document | 13 | | | |
| AdventureWorks2017 | Production | Illustration | 5 | | | |
| AdventureWorks2017 | Production | Location | 14 | | | |
| AdventureWorks2017 | Production | Product | 504 | | | |
| AdventureWorks2017 | Production | ProductCategory | 4 | | | |
| AdventureWorks2017 | Production | ProductCostHistory | 395 | | | |
| AdventureWorks2017 | Production | ProductDescription | 762 | | | |
| AdventureWorks2017 | Production | ProductDocument | 32 | | | |
| AdventureWorks2017 | Production | ProductInventory | 1,069 | | | |
| AdventureWorks2017 | Production | ProductListPriceHistory | 395 | | | |
| AdventureWorks2017 | Production | ProductModel | 128 | | | |
| AdventureWorks2017 | Production | ProductModelIllustration | 7 | | | |
| AdventureWorks2017 | Production | ProductModelProductDescriptionCulture | 762 | | | |
| AdventureWorks2017 | Production | ProductPhoto | 101 | | | |
| AdventureWorks2017 | Production | ProductProductPhoto | 504 | | | |
| AdventureWorks2017 | Production | ProductReview | 4 | | | |
| AdventureWorks2017 | Production | ProductSubcategory | 37 | | | |
| AdventureWorks2017 | Production | ScrapReason | 16 | | | |
| AdventureWorks2017 | Production | TransactionHistory | 113,443 | | | |
| AdventureWorks2017 | Production | TransactionHistoryArchive | 89,253 | | | |
| AdventureWorks2017 | Production | UnitMeasure | 38 | | | |
| AdventureWorks2017 | Production | WorkOrder | 72,591 | | | |
| AdventureWorks2017 | Production | WorkOrderRouting | 67,131 | | | |
| AdventureWorks2017 | Purchasing | ProductVendor | 460 | | | |
| AdventureWorks2017 | Purchasing | PurchaseOrderDetail | 8,845 | | | |
| AdventureWorks2017 | Purchasing | PurchaseOrderHeader | 4,012 | | | |
| AdventureWorks2017 | Purchasing | ShipMethod | 5 | | | |
| AdventureWorks2017 | Purchasing | Vendor | 104 | | | |

AdventureWorks2017

| dbName | SchemaName | TableName | Table_Rows | Sales | Inventory | Purchasing |
|--------------------|------------|-----------------------------|------------|-------|-----------|------------|
| AdventureWorks2017 | Sales | CountryRegionCurrency | 109 | | | |
| AdventureWorks2017 | Sales | CreditCard | 19,118 | | | |
| AdventureWorks2017 | Sales | Currency | 105 | | | |
| AdventureWorks2017 | Sales | CurrencyRate | 13,532 | | | |
| AdventureWorks2017 | Sales | Customer | 19,820 | | | |
| AdventureWorks2017 | Sales | PersonCreditCard | 19,118 | | | |
| AdventureWorks2017 | Sales | SalesOrderDetail | 121,317 | | | |
| AdventureWorks2017 | Sales | SalesOrderHeader | 31,465 | | | |
| AdventureWorks2017 | Sales | SalesOrderHeaderSalesReason | 27,647 | | | |
| AdventureWorks2017 | Sales | SalesPerson | 17 | | | |
| AdventureWorks2017 | Sales | SalesPersonQuotaHistory | 163 | | | |
| AdventureWorks2017 | Sales | SalesReason | 10 | | | |
| AdventureWorks2017 | Sales | SalesTaxRate | 29 | | | |
| AdventureWorks2017 | Sales | SalesTerritory | 10 | | | |
| AdventureWorks2017 | Sales | SalesTerritoryHistory | 17 | | | |
| AdventureWorks2017 | Sales | ShoppingCartItem | 3 | | | |
| AdventureWorks2017 | Sales | SpecialOffer | 16 | | | |
| AdventureWorks2017 | Sales | SpecialOfferProduct | 538 | | | |
| AdventureWorks2017 | Sales | Store | 701 | | | |

AdventureWorksDW2017

| dbName | TableName | Table Rows | Internet Sales | Reseller Sales | Inventory |
|----------------------|---|------------|----------------|----------------|-----------|
| AdventureWorksDW2017 | AdventureWorksDWBuildVersion | 1 | | | |
| AdventureWorksDW2017 | DatabaseLog | 96 | | | |
| AdventureWorksDW2017 | DimAccount | 99 | | | |
| AdventureWorksDW2017 | DimCurrency | 105 | | | |
| AdventureWorksDW2017 | DimCustomer | 18,484 | | | |
| AdventureWorksDW2017 | DimDate | 3,652 | | | |
| AdventureWorksDW2017 | DimDepartmentGroup | 7 | | | |
| AdventureWorksDW2017 | DimEmployee | 296 | | | |
| AdventureWorksDW2017 | DimGeography | 655 | | | |
| AdventureWorksDW2017 | DimOrganization | 14 | | | |
| AdventureWorksDW2017 | DimProduct | 606 | | | |
| AdventureWorksDW2017 | DimProductCategory | 4 | | | |
| AdventureWorksDW2017 | DimProductSubcategory | 37 | | | |
| AdventureWorksDW2017 | DimPromotion | 16 | | | |
| AdventureWorksDW2017 | DimReseller | 701 | X | | |
| AdventureWorksDW2017 | DimSalesReason | 10 | | | |
| AdventureWorksDW2017 | DimSalesTerritory | 11 | | | |
| AdventureWorksDW2017 | DimScenario | 3 | | | |
| AdventureWorksDW2017 | FactAdditionalInternationalProductDescription | 15,168 | | | |
| AdventureWorksDW2017 | FactCallCenter | 120 | | | |
| AdventureWorksDW2017 | FactCurrencyRate | 14,264 | | | |
| AdventureWorksDW2017 | FactFinance | 39,409 | | | |
| AdventureWorksDW2017 | FactInternetSales | 60,398 | | | |
| AdventureWorksDW2017 | FactInternetSalesReason | 64,515 | | | |
| AdventureWorksDW2017 | FactProductInventory | 776,286 | | | |
| AdventureWorksDW2017 | FactResellerSales | 60,855 | | | |
| AdventureWorksDW2017 | FactSalesQuota | 163 | | | |
| AdventureWorksDW2017 | FactSurveyResponse | 2,727 | | | |
| AdventureWorksDW2017 | NewFactCurrencyRate | 50 | | | |
| AdventureWorksDW2017 | ProspectiveBuyer | 2,059 | | | |
| AdventureWorksDW2017 | sysdiagrams | 9 | | | |

Data Modeling

Data Modeling with AdventureWorks



Assignment:

Create Data Models (Reverse Engineering)

- AdventureWorksDW2017
 - All tables
 - Reseller Sales
 - Internet Sales
- AdventureWorks2017
 - All tables
 - Reseller Sales
 - Internet Sales
- Note: the data models need to be able to answer the following questions.

Internet ?s that the data models need to support

- What are the sales, product costs, profit, number of orders & quantity ordered for internet sales by Product Hierarchy (Category, Subcategory, Model & Product) and ranked by sales?
- What are the sales, product costs, profit, number of orders & quantity ordered for both internet sales by product category and ranked by sales?
- What are the top ten (internet) customers (last name, first name) ranked by sales?
- What are the sales, product costs, profit, number of orders & quantity ordered for internet sales by Geo Hierarchy (Country, State & City) and ranked by sales?
- What are the sales, product costs, profit, number of orders & quantity ordered by Customer Occupation?
- What are the internet sales by month & year?

Reseller ?s that the data models need to support

- What are the sales, product costs, profit, number of orders & quantity ordered for reseller sales by Product Hierarchy (Category, Subcategory, Model & Product) and ranked by sales?
- What are the sales, product costs, profit, number of orders & quantity ordered for both reseller sales by product category and ranked by sales?
- What are the ranked sales of the sales people (employees)?
- What are the top ten resellers by reseller hierarchy (business type, reseller name) ranked by sales?
- What are the sales, product costs, profit, number of orders & quantity ordered for reseller sales by Geo Hierarchy (Country, State & City) and ranked by sales?
- What are the reseller sales by month & year?

Assignment:

Create Data Models (Reverse Engineering)

Deliverables:

- Reverse engineer Physical Data Model for each database & requested sub-model
- Image (png) for each sub-model
- List Table(s) with each sub-model
- Upload data model file(s)