Introduction to Power BI

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Power BI History

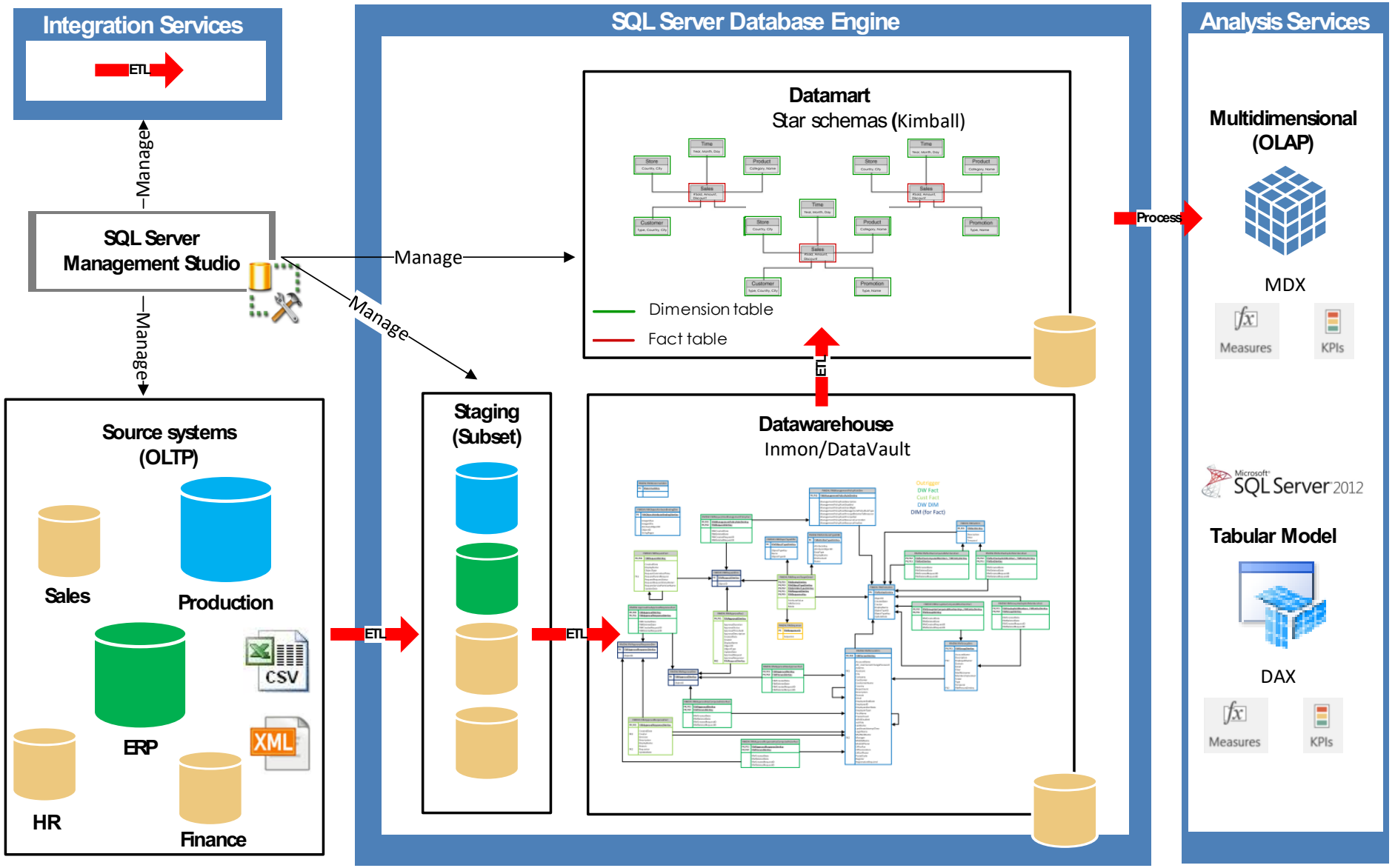
1st wave - 1996
Technical BI

2nd wave - 2008
Self Service BI

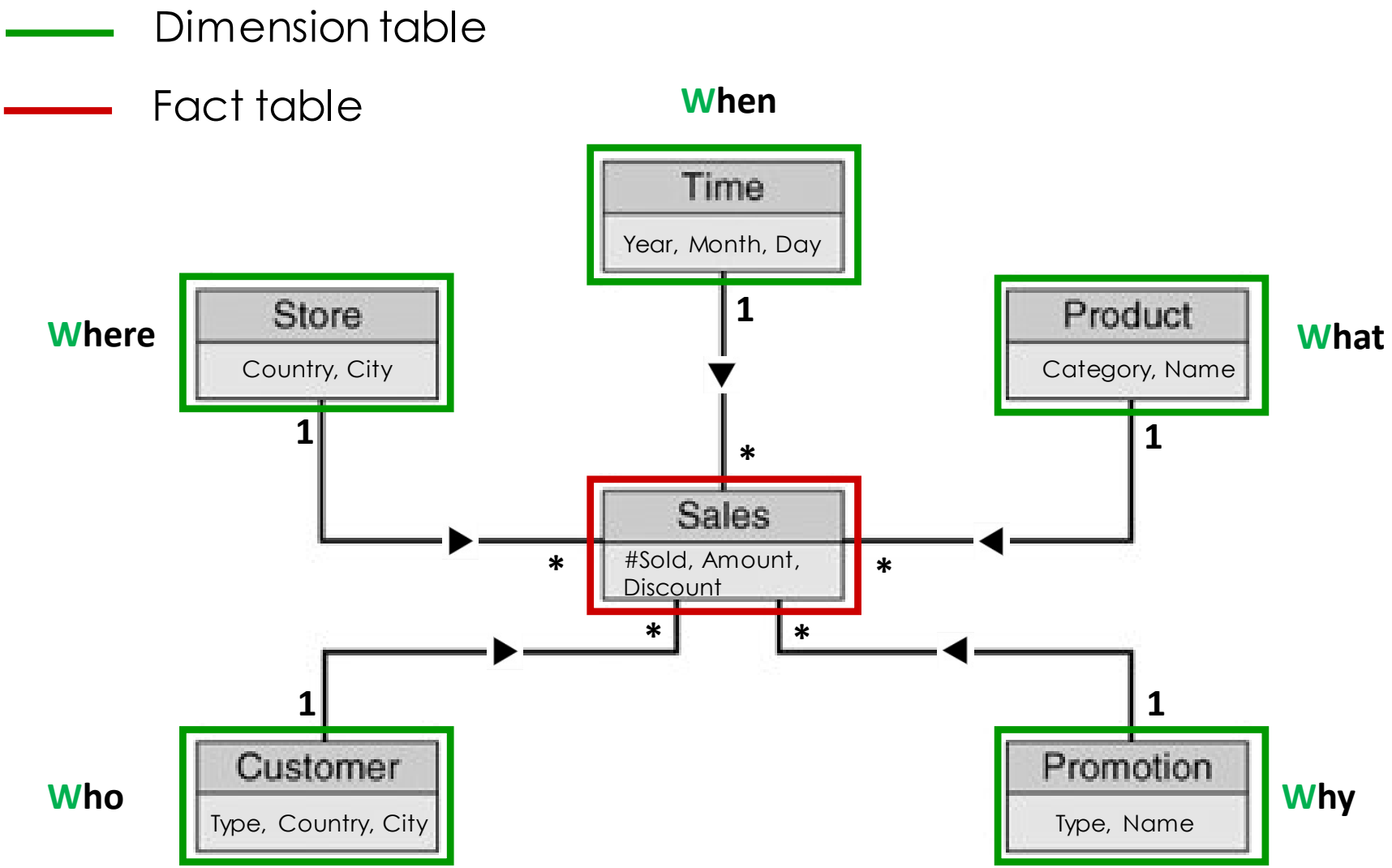
3rd wave
End-User BI

Technical BI: ETL + SQL Server BI Architecture

ETL = Extract Transform Load



Star schema


Dimension table
Fact table
When
Time
Year, Month, Day
Where
Store
Country, City
Product
Category, Name
What
1
1
1
*
*
*
*
*
Sales
#Sold, Amount, Discount
1
1
Who
Customer
Type, Country, City
Promotion
Type, Name
Why

1 to many (*) relationship

1

CustomerID	Customer	Gender	BirthDate
16	James Sergent	Male	26-1-1977
17	Will Castillo	Male	10-4-2001
18	Ian Kelly	Male	11-5-1976
19	David Baker	Male	8-2-1967
20	Dan Simpson	Male	6-9-1965
21	Daryl Davidson	Male	24-5-1966
22	Lori McIsaac	Female	21-9-1984
23	Annie Harper	Female	11-4-1959
24	Tony Garneau	Male	13-10-1998
25	Zach Fabro	Male	9-7-2002
26	Trisha Sanders	Female	26-4-1999
27	Jon Witt	Male	28-9-1979

many (*)

OrderID	ProductID	CustomerID	OrderDate	Price	Quantity	LineTotal
1071	402001	17	15-12-2017	€ 246,92	3	€ 740,76
1071	301221	17	15-12-2017	€ 764,85	1	€ 764,85
1072	7402	25	16-12-2017	€ 23,5	2	€ 47
1073	2202	49	16-12-2017	€ 53,9	3	€ 161,7
1073	2205	49	16-12-2017	€ 41,9	3	€ 125,7
1073	301161	49	16-12-2017	€ 764,85	1	€ 764,85
1074	2206	69	16-12-2017	€ 41,9	3	€ 125,7
1074	302161	69	16-12-2017	€ 479,85	1	€ 479,85
1075	2204	15	16-12-2017	€ 41,9	3	€ 125,7
1076	201161	55	17-12-2017	€ 790,73	3	€ 2.372,19
1076	402002	55	17-12-2017	€ 274,35	2	€ 548,7
1076	303182	55	17-12-2017	€ 329,85	2	€ 659,7
1077	2205	30	17-12-2017	€ 41,9	2	€ 83,8
1078	5401	36	18-12-2017	€ 14,5	2	€ 29
1079	2206	28	18-12-2017	€ 41,9	2	€ 83,8
1080	303182	51	18-12-2017	€ 296,87	3	€ 890,61
1080	1106	51	18-12-2017	€ 16,5	2	€ 33
1081	5401	25	19-12-2017	€ 14,5	3	€ 43,5
1081	202161	25	19-12-2017	€ 539,85	2	€ 1.079,7

Fact v.s. Dimension table

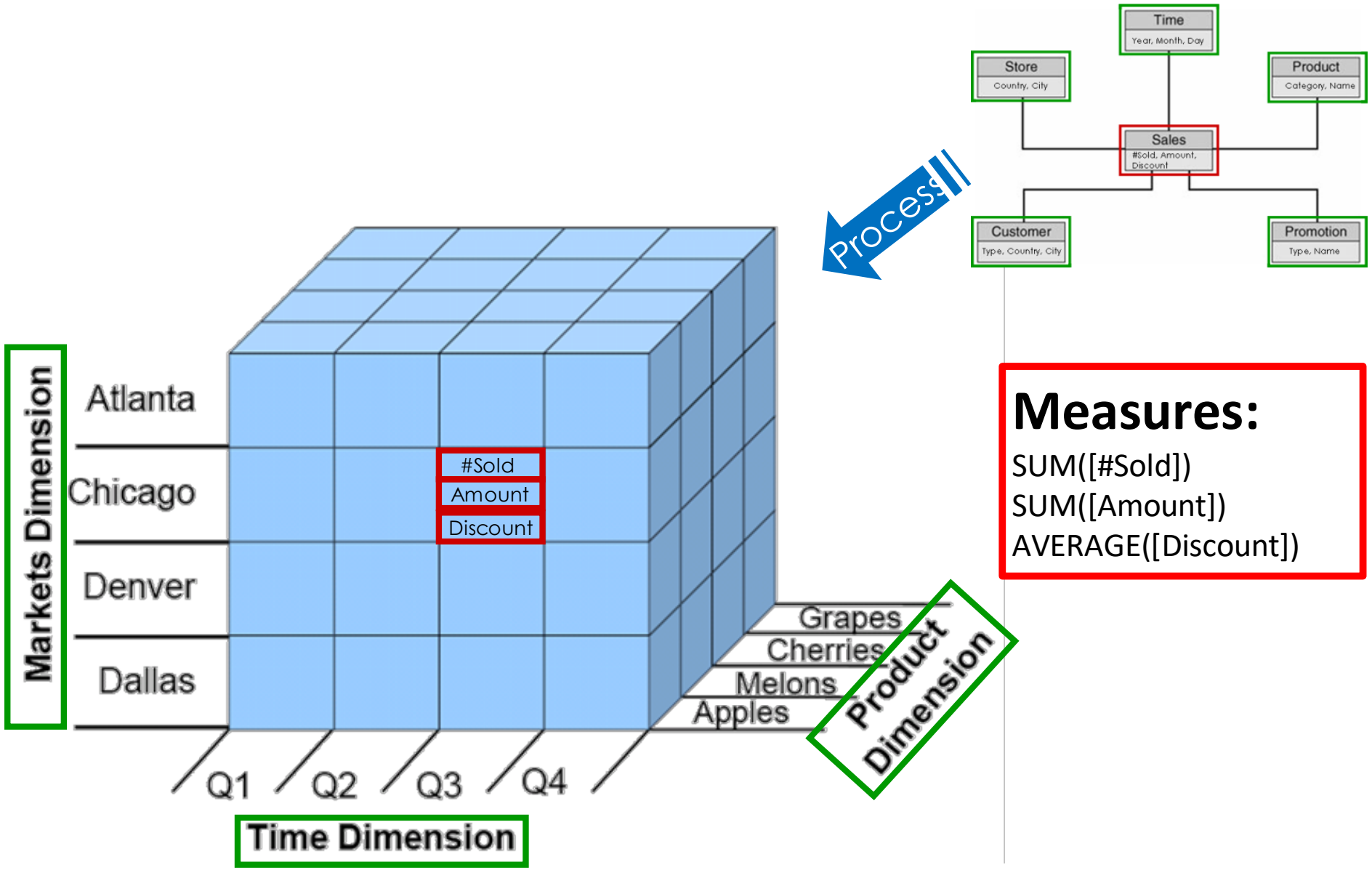
Fact table:

- Contains **Values** / facts that can be aggregated like: Revenue, Quantity, Price, Discount, # of Hours etc.
- Is on the **many side** of the relationship.
- Has a **date** column: date, year, quarter, month, week etc.
- Examples:
  - **Sales:** Orders, Invoices, Product Prices, Sales Targets
  - **Finance:** Financial Transactions, Budgets, Forecasts, Profit & Loss
  - **HR:** FTE, Sick leave, Salary, Worker inflow/outflow
  - **Project Management:** TimeTracking, Budgets, Issues, Planning
  - **Production:** Production, Stock, Incidents, Measurements, Leadtimes

Dimension table:

- Contains columns / entities you want to use for **filtering, grouping** and **sorting.**
- Is on the **one side** of the relationship.
- Examples:
  - **Sales:** Products, Customers, Stores, Regions, Accountmanagers, Resellers
  - **Finance:** CostCentres, LedgerAccounts, Business Units
  - **HR:** Employees, Functions, Departments, Managers
  - **Project Management:** Projects, Project Leads, Project Members
  - **Production:** Machines, Production Lines, Operators, Sensors, Parts

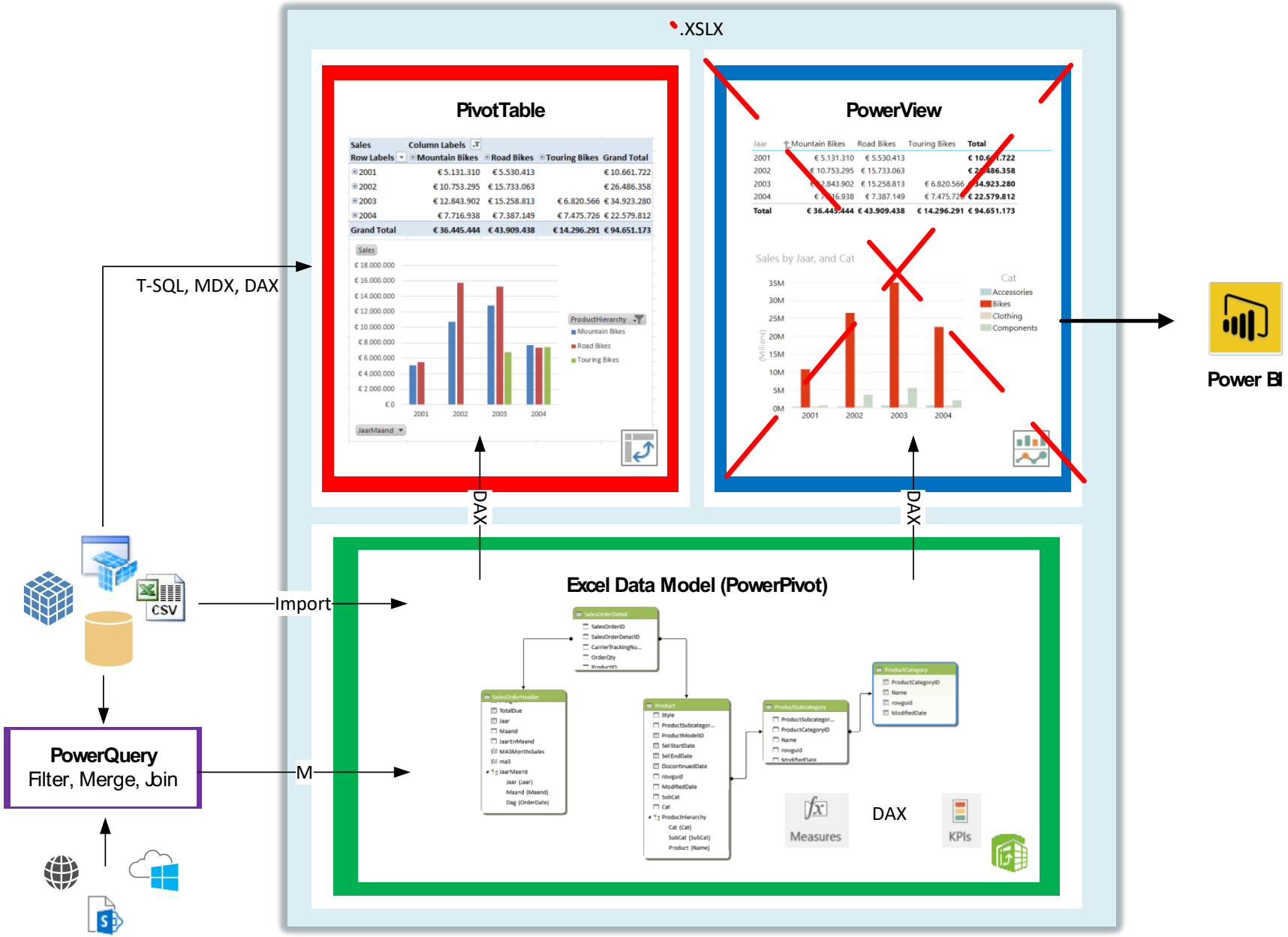
OLAP Cube / SQL Server Analysis Services Model



Measures:

SUM([#Sold])
SUM([Amount])
AVERAGE([Discount])

Self Service BI: PowerPivot



Power BI Overview

Power Query

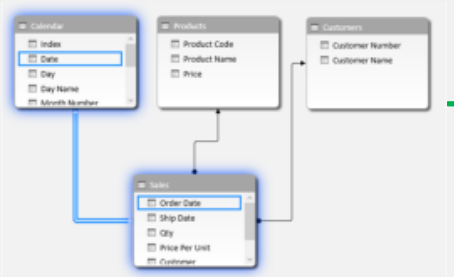
Dataset / Model

Report

app.powerbi.com

01 Collect and transform data

02 Model and analyse



03 Visualize in a Report

04 Publish and share

05 View on any device

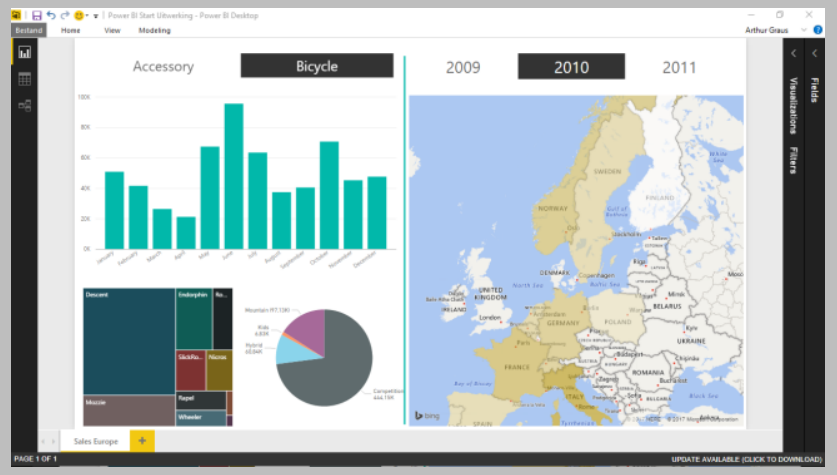
Power BI - Desktop

Power BI - Service

Power BI - App

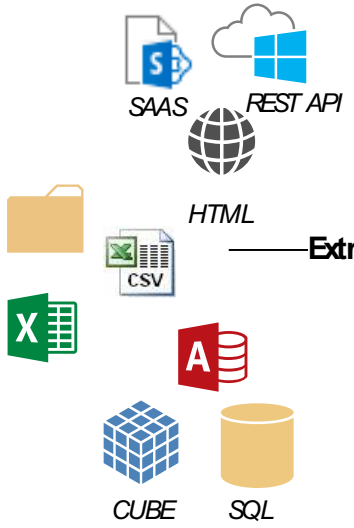
Power BI Desktop

Report



HTML 5 + JavaScript / PowerView

ETL = Extract Transform Load



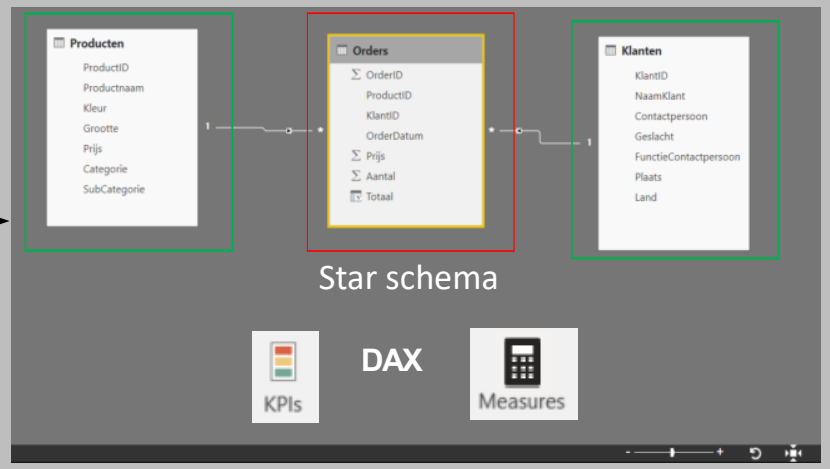
Extract

Transform / Power Query

Power Query Formula Language: "M"

Load

Model / Dataset



X-Velocity Engine / PowerPivot / SSAS Tabular Model

Publish