

Why? Where? Spatial Analysis in Excel 2013

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Presenter Introduction

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Presentation Outline

Spatial Analysis with Excel 2013

Preparing the Data Model

Introducing the Power View Map

Introducing GeoFlow for Excel

Summary

Resources

Spatial Analysis with Excel 2013



Spatial analysis allows for the study and exploration of data by using geometric or geographic properties

SQL Server supports spatial analysis

- Database engine: GEOMETRY and GEOGRAPHY data types
- Reporting services: Map data region

Excel 2013 enables self-service spatial analysis

- PowerPivot: Definition of spatial fields (data categorization)
- Power View: Map reporting
- GeoFlow: Discovery and sharing of new insights from geographic and temporal data through rich 3D storytelling
- Both Power View and GeoFlow are powered by Bing Maps
 - Internet connectivity is required
 - A tabular data model is required, preferably prepared for spatial analysis

Preparing the Data Model

PowerPivot in Excel 2013 now supports data categorization

Data categorization:

- Is used to markup data model columns
- The markup recognized by reporting tools, such as Power View and GeoFlow
- Can be detected automatically (by default) when data model tables are created
- Includes pre-defined spatial categories

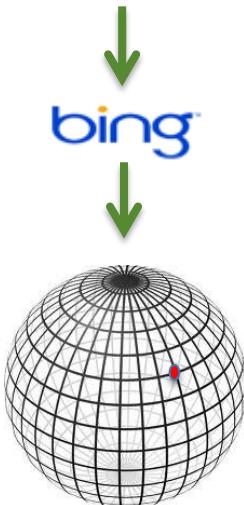
Pre-defined spatial categories:

- Decimal number: Latitude, Longitude
- Text data: Address, City, Continent, Country/Region, Country, Postal Code, State or Province, Place
 - Text data requires geocoding to lookup the spatial coordinates

Preparing the Data Model

Geocoding

New York



Bing Maps geocodes text locations to spatial coordinates (latitude and longitude values)

If limited information is provided (for example, only a city name), Bing Maps will geocode to the location based on highest population, or possibly popularity according to search frequency

To ensure accurate geocoding:

- Include additional columns in the data model
 - For example, Country, State, etc.
- Data categorize columns correctly
- Produce hierarchies to navigate to members
 - For example, Country ▶ State ▶ City
 - Ancestor members will also be sent for geocoding
- Hide columns to ensure hierarchies are used

Preparing the Data Model

Avoiding Geocoding

Latitude and Longitude values can be stored in the data model:

- Values do not require geocoding
- Values must be stored in decimal format
- This approach is fast and accurate for mapping
- Values can be aggregated and used to filter maps by spatial coordinate boundaries
- However, it requires sourcing and storing the spatial coordinates

Spatial coordinates can be sourced in a number of ways:

- Values stored with the SQL Server GEOGRAPHY data type can be converted to decimal latitude and longitude values
 - The **Lat** and **Long** properties of the GEOGRAPHY instance return FLOAT values
- Manually lookup the coordinates by using web browser tools, for example Bing Maps
- Third party services, for example Melissa Data (US addresses only)

Demonstration



Preparing a PowerPivot Data Model for Spatial Analysis

Introducing the Power View Map

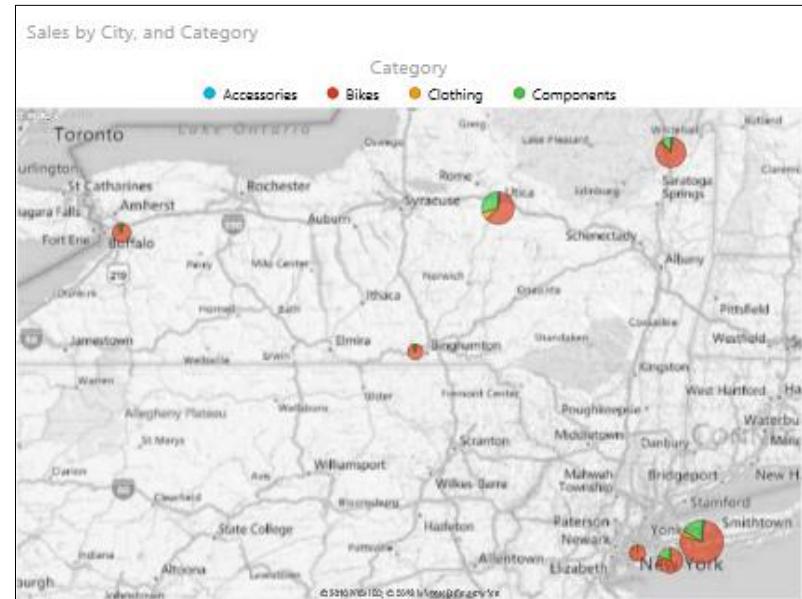
The Power View Map plots points at spatial coordinates

- The size of a point is based on a calculated field
- Facts about each bubble are available in a tooltip

The map can be configured to use tiling, color (categories with legend, and points are expressed as pie charts) and multiples

The map layout and point labels are configurable

There is no capability for plotting areas (polygons) or lines



Configuring the Power View Map

Identifying Spatial Fields

- In the Field List, spatially categorized fields are marked with a spatial icon

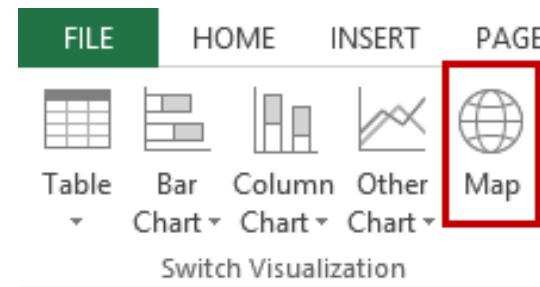
Power View Fields

ACTIVE | ALL



Creating a Map

- Create a table consisting of spatial fields and other fields
- Switch the table to a Map visualization



- Configure the Map layout
- Customize the Map labels

Configuring the Power View Map

Layout Configuration

The Map layout supports:

- Tiling by a field
 - Allows interactive filtering by labels and images
- A calculated field to use to determine the size of the point shown at the spatial coordinates
- Location field(s) – or longitude and latitude fields
 - Multiple location fields will allow drilling down/up
 - Adding a hierarchy will add all hierarchy levels
- A field to categorize by color
 - Each point is then expressed as a pie chart
 - A legend is automatically added to describe the categorization
- Vertical and horizontal multiples
 - Produces multiple maps, one for each field value

Drag fields between areas below:

TILE BY

Σ SIZE

LOCATIONS

LONGITUDE

LATITUDE

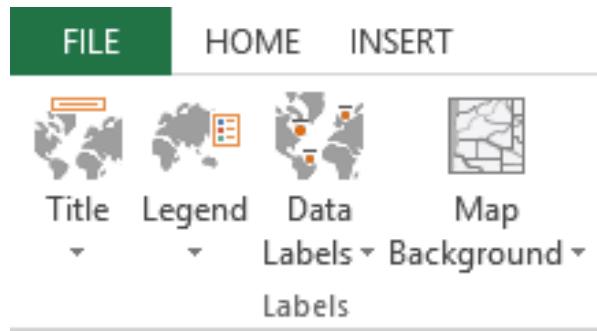
COLOR

VERTICAL MULTIPLES

HORIZONTAL MULTIPLES

Configuring the Power View Map

Configuring the Map



Use the Layout ribbon to configure the map labels:

- Turn the automatic title off
- Turn the legend off, or reposition around the map
- Turn data labels off, or reposition around the points
- Modify the map background:
 - Road map
 - Greyscale road map (default)
 - Reversed greyscale road map
 - Aerial (satellite photo) map
 - Greyscale aerial map

Different colors can be used by changing the theme

Working with the Power View Map

Interacting with the Map

The user can:

- Zoom in and out
- Pan up, down, left and right
 - Panning can also be achieved by dragging the map
- Hover over spatial points to reveal facts and statics about them
- Select legend members to filter the map and other visualizations on the Power View sheet
- Drill down the hierarchy of locations by double-clicking the spatial points
- Drill up, by using the “Up” icon located at the top right corner
- Filter the entire map

Demonstration



Creating, Configuring and Interacting with a Power View Map

Introducing GeoFlow for Excel

Transform data into fluid 3D stories, unlocking new insights for everyone

Map Data: Plot up to a million rows of data in 3-D by using Bing Maps

Discover Insights: Explore your data in geographic space and see time-stamped data change over time

Share Stories: Capture screenshots and build cinematic, guided video tours that can be shared broadly, engaging audiences like never before



Demonstration



Introducing GeoFlow for Excel

Summary

Spatial analysis allows for the study and exploration of data by using geometric or geographic properties

Excel 2013 supports self-service geographic spatial analysis with:

- Power View
- GeoFlow

Both reporting tools require internet access and a tabular data model

The tabular data model can be optimized for spatial analysis with:

- Appropriate data
- Data categorization
- Hierarchies

Resources

PowerPivot Site

<http://powerpivot.com>

Microsoft Office Customer Preview

Sign up and evaluate today!

<http://www.microsoft.com/office/preview>

Blog entry: “Going All In with Excel 2013”

<http://blogs.msdn.com/b/analysisservices/archive/2012/07/26/going-all-in-with-excel-2013.aspx>

Private GeoFlow beta

Send email to: GeoFlowBetaRequest@microsoft.com

Questions?



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