Using Map Views and Spatial Analytics in OBI 11g

BIWA Summit 2014

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Vlamis Software Solutions

- Vlamis Software founded in 1992 in Kansas City, Missouri
- Developed more than 200 Oracle BI systems
- Specializes in ORACLE-based:
  - Data Warehousing
  - Business Intelligence
  - Design and integrated BI and DW solutions
  - Training and mentoring
- Expert presenter at major Oracle conferences
- www.vlamis.com (blog, papers, newsletters, services)
- Developer for IRI (former owners of Oracle OLAP)
- Co-author of book “Oracle Essbase & Oracle OLAP”
- Beta tester for OBIEE 11g
- Reseller for Simba and Nokia map data for OBIEE
- HOL Coordinator for BIWA Summit 2013
Join the community

• IOUG Oracle Spatial and Graph SIG
  • Signup on the membership/interest list today
  • Talk to board members
  • Email: oraclespatialsig@gmail.com
  • *Increased interest from business/BI communities
Overview

• Why Maps are a Superior Visualization
• Quick Demo
• Maps are a Native View in OBIEE 11g
• Map Basics in OBIEE 11g
• Oracle MapViewer and OBIEE
• Oracle Locator and Oracle Spatial
• NAVTEQ Data
• Demo of Maps in OBIEE
• Review and Summary
Why Maps are Powerful

Maps convey dense, multi-dimensional relationships in data faster and more intuitively than any other graphical display methodology.
Humans Think Spatially
What is Spatial Data?

- Business data that contains or describes location
  - Street and postal address (customers, stores, factory, etc.)
  - Sales data (sales territory, customer registration, etc.)
  - Assets (cell towers, pipe lines, electrical transformers, etc.)
  - Geographic features (roads, rivers, parks, etc.)
- Anything connected to a physical location
When Are Map Views Useful?

- Visualizing data related to geographic locations.
- Showing or detecting spatial relationships and patterns.
- Showing lots of data in a relatively small area.
- Drilling down from a (map) overview to a detailed report, chart, or graph.
- Whenever location is important!
Map Interactivity in OBIEE 11g

- Display BI data on top of maps
  - Color fill
  - FOI (feature of interest) point display
- Interact with other Dashboard Elements
  - Drive map content with dashboard prompts
  - Drive map content through drilling and navigation
  - Drive other dashboard elements through map interactions
- Reveal information on maps through mouseovers
- Drill to map detail
Oracle MapViewer

- Component of Oracle Fusion Middleware
- Runs in WebLogic and other J2EE environments.
- Developer’s visualization “toolkit” of programmable Java components and APIs for rendering maps and data.
- Used for embedding maps in web-based applications and rendering location-based content.
- Connects to geospatial application data tables.
- Map Builder is the java application for editing metadata in an Oracle Database (themes, styles, base maps).
MapViewer “mashup” in OBIEE

MapBuilder Spatial Theme

BI EE: Manage Map Data

Admin tool - BI Data

BI Answers Map View
Map Definitions

• **STYLE**
  • Define rendering properties for spatial shape or point on maps.
  • Can control fill color, border color, line thickness, line style and more

• **THEME**
  • Typically associated with a spatial geometry layer
  • Metadata that specifies geospatial data to be rendered, styles to be applied, and optional query conditions for filtering.
  • County/state boundaries, major highways, etc…

• **BASEMAP**
  • A grouping of predefined themes to create a map
  • Maps can share themes
  • When associating a theme with a map, can specify min scale and max scale (sometimes known as zoom control)

• **MAP**
  • Basemap with additional themes overlain
Using Spatial Data in OBIEE 11g

- Possible use cases

How does customer data reference location?

1. Load customers map data, usually provided as Shape File(s)
2. Configure MapViewer theme(s)
3. Configure theme for Map View
4. Proceed as above

Include coordinates in presentation layer and use “Custom Point Layer” Map Layout specifying longitude as X, latitude as Y

Perform address geocoding preprocess to derive/store coordinates from addresses and then proceed as above

1. Ensure unique key in presentation table matches key in map data.
2. Configure presentation table for mapping using Administration>Manage Map Data

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Oracle Locator and Oracle Spatial

• Oracle Locator is a **feature** of both Oracle Standard and Enterprise Database Editions.

• Oracle Locator provides basic location functionality.
  • Point, line, and polygon spatial locations (SDO_GEOMETRY)
  • Spatial indexing
  • Spatial operators that use the spatial index for performing spatial inquiries.

• Oracle Spatial is an **option** for Oracle Database Enterprise Edition
  • Provides extensive support for advanced spatial processing and analytics including routing, vector and raster data, topology and network models, and more.
Map View Formats

- **Color Fill (choropleth)**
  - Percentile, Value, Continuous binning
  - Dashboard user run-time slider
- **Graphs – Bar, Pie**
  - Adjustable graph size
  - Series by second dimension
- **Bubble (variable sized)**
  - Min-Max size specification
  - Color specification
- **Variable Shape**
  - Circle, Triangle, Diamond
  - Customizable
- **Image**
  - Imported via MapViewer
  - More can be added from MapBuilder
- **Custom Point Layer**
  - Uses Lat / Long
  - Does not require a Layer Def
Map View Tips

• Think about what scale to use. Different map scales will reveal different patterns and insights.
• Use Variable marker to display two measures on a map at a point – size and color.
• Avoid overlapping shapes too much.
• Be aware of spatial distortions. E.g. Texas is larger than Connecticut.
• Look at color palette.  www.colorbrewer2.org
Using Color Effectively

• Consciously choose a color palate.

• ColorBrewer2.org
  • Sequential schemes
    • Designed for ordered data that progresses from low to high.

• Divergent schemes
  • Place equal emphasis on mid-range values and extremes at both ends of the data range.

• Qualitative schemes
  • Used for nominal and categorical data where magnitude differences between classes should not be emphasized.
Demo of Oracle BI 11g Maps
Nokia is the leading global provider of digital map, traffic and location data that enables navigation and location-based platforms around the world.

Nokia data is licensed direct or through a reseller.

Licenses are use specific.

Nokia data resides inside your own Oracle Database.

Nokia publishes an ODF (Oracle Data Format) version of its data designed specifically for use in an Oracle Database instance.
Nokia Content for OBI

- Geocoding
- Points of Interest
Spatial Analytics Example

People Living Within Distance of Store Type

- Population Information (by census blocks) on people living within distance of specified Store Type

- Requires Spatial analytic function (sdo_within_distance)

- Combines non-BI data (population information)
Deconstructing The Analysis

The Dashboard Components

Map View
Standard Answers view

Pivot View
Standard Answers view

Answers Criteria
Underlying table in RPD is an OPAQUE view with parameterized SQL containing Spatial functions

Distance, Postal Code, Category
Prompts
Populate request variables; passed on down as Session Variables

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Deconstructing The Analysis

Prompts, Variables, Opaque Views

**Prompts**

- Populate request variables; passed on down as Session Variables to BI Server

**Answers Criteria**

Columns from Subject Area (L – Geo Loc)
Deconstructing The Analysis

Opaque View
Parameterized SQL utilizes Oracle Spatial function (sdo_within_distance) to perform spatial analytics.

Session Variables
Values set in Dashboard as Request Variables; passed on down to Server as session variables.

Session Variable - OGS_ADDRESS

Opaque View
Parameterized SQL utilizes Oracle Spatial function (sdo_within_distance) to perform spatial analytics.

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For more information

• **Oracle Business Analytics:** [oracle.com/bi](http://oracle.com/bi)
  - @OracleAnalytics
  - @OracleBITech
  - [www.youtube.com/evolvingBI](http://www.youtube.com/evolvingBI)

• **Oracle Spatial and Graph Resources:**
    White papers, downloads, case studies & more
  • IOUG Spatial and Graph SIG
  • @oracledatabase
  • [www.facebook.com/OracleDatabase](http://www.facebook.com/OracleDatabase)
Oracle Test Drive

- Free to try out Oracle BI
- Go to www.vlamis.com/testdrive-registration/
- Runs off of Amazon AWS
- Hands-on Labs based on Collaborate 2012 HOLs
- Test Drives for:
  - Oracle BI
  - BI Publisher
  - Microsoft Excel against Oracle OLAP
  - Oracle Data Mining
  - Map Views in OBIEE 11g
- Once sign up, you have private instance for 5 hours
- Available now
Thank You for Attending Session

Using Maps and Geo Spatial Analytics in Oracle Business Intelligence 11g

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