



SOFTWARE SOLUTIONS

Using Map Views and Spatial Analytics in OBI 11g

BIWA Summit 2014

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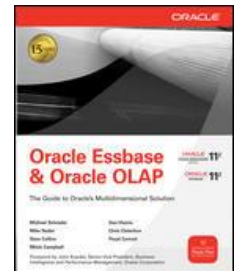
816-781-2880

<http://www.vlamis.com>



Vlamis Software Solutions

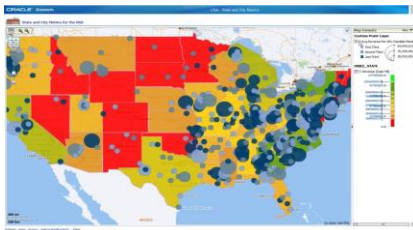
- Vlamis Software founded in 1992 in Kansas City, Missouri
- Developed more than 200 Oracle BI systems
- Specializes in ORACLE-based:
 - Data Warehousing
 - Business Intelligence
 - Design and integrated BI and DW solutions
 - Training and mentoring
- Expert presenter at major Oracle conferences
- www.vlamis.com (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

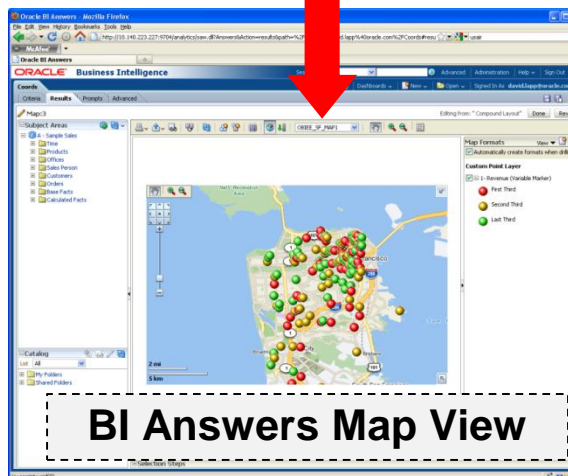
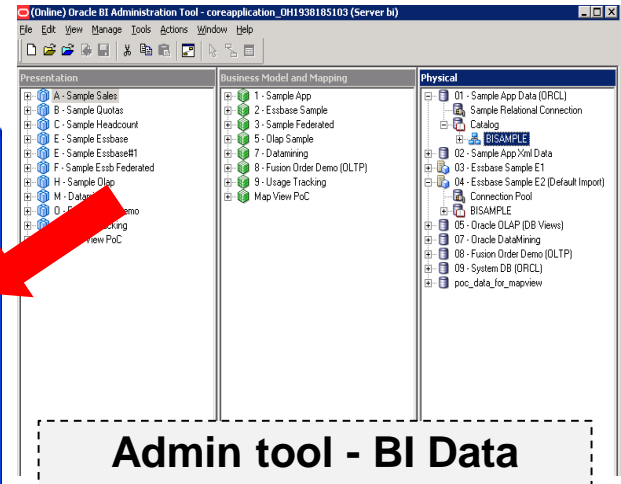
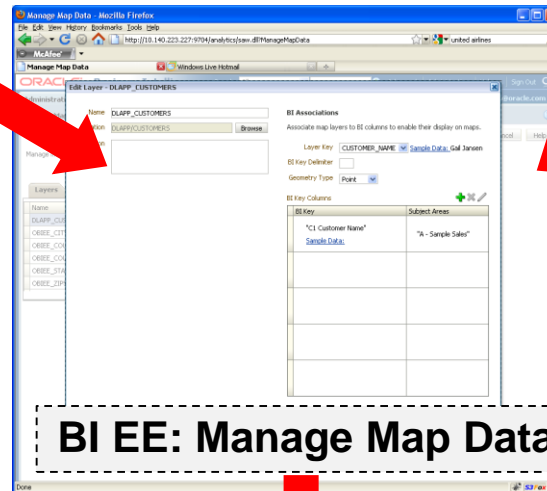
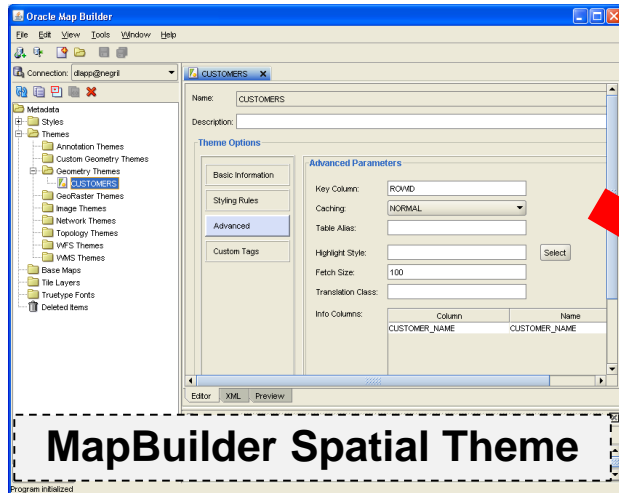
- Display BI data on top of maps
 - Color fill
 - FOI (feature of interest) point display
- Interact with other Dashboard Elements
 - Drive map content with dashboard prompts
 - Drive map content through drilling and navigation
 - Drive other dashboard elements through map interactions
- Reveal information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





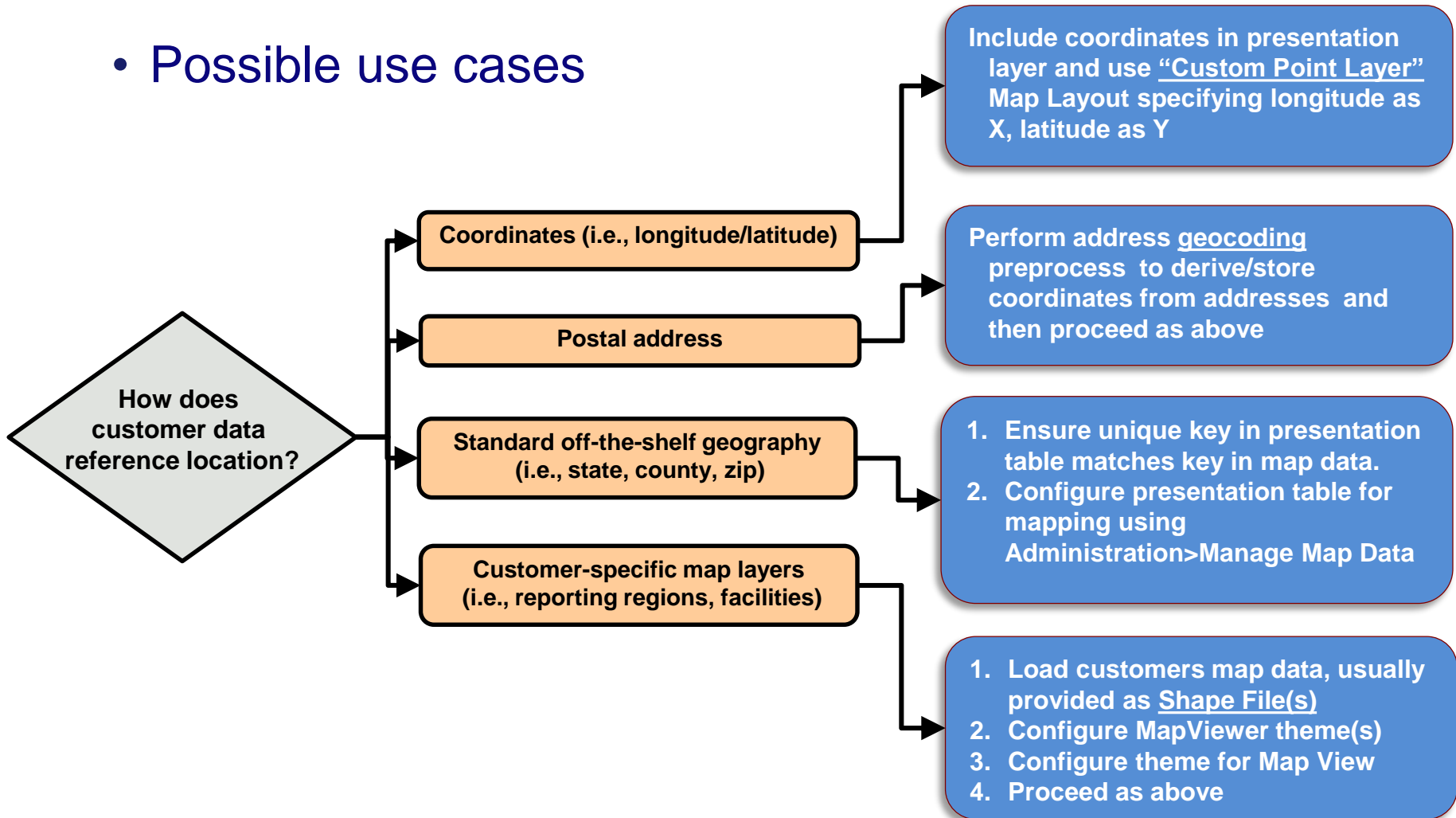
Map Definitions

- **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





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



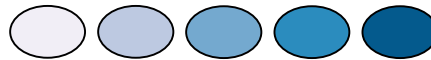
Map View Tips

- 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.





Colorbrewer2.org

number of data classes on your map
3 [learn more >](#)

the nature of your data
sequential [learn more >](#)

pick a color scheme: BuGn

multihue single hue

(optional) only show schemes that are:

☐ colorblind safe ☐ print friendly

☐ photocopy-able [learn more >](#)

pick a color system

229, 245, 249

153, 216, 201

44, 162, 95

☒ RGB ☐ CMYK ☐ HEX

adjust map context

☐ roads

☐ cities

☒ borders

select a background

☒ solid color

☐ terrain

color transparency

[learn more >](#)

[how to use](#) | [updates](#) | [credits](#)

COLORBREWER 2.0

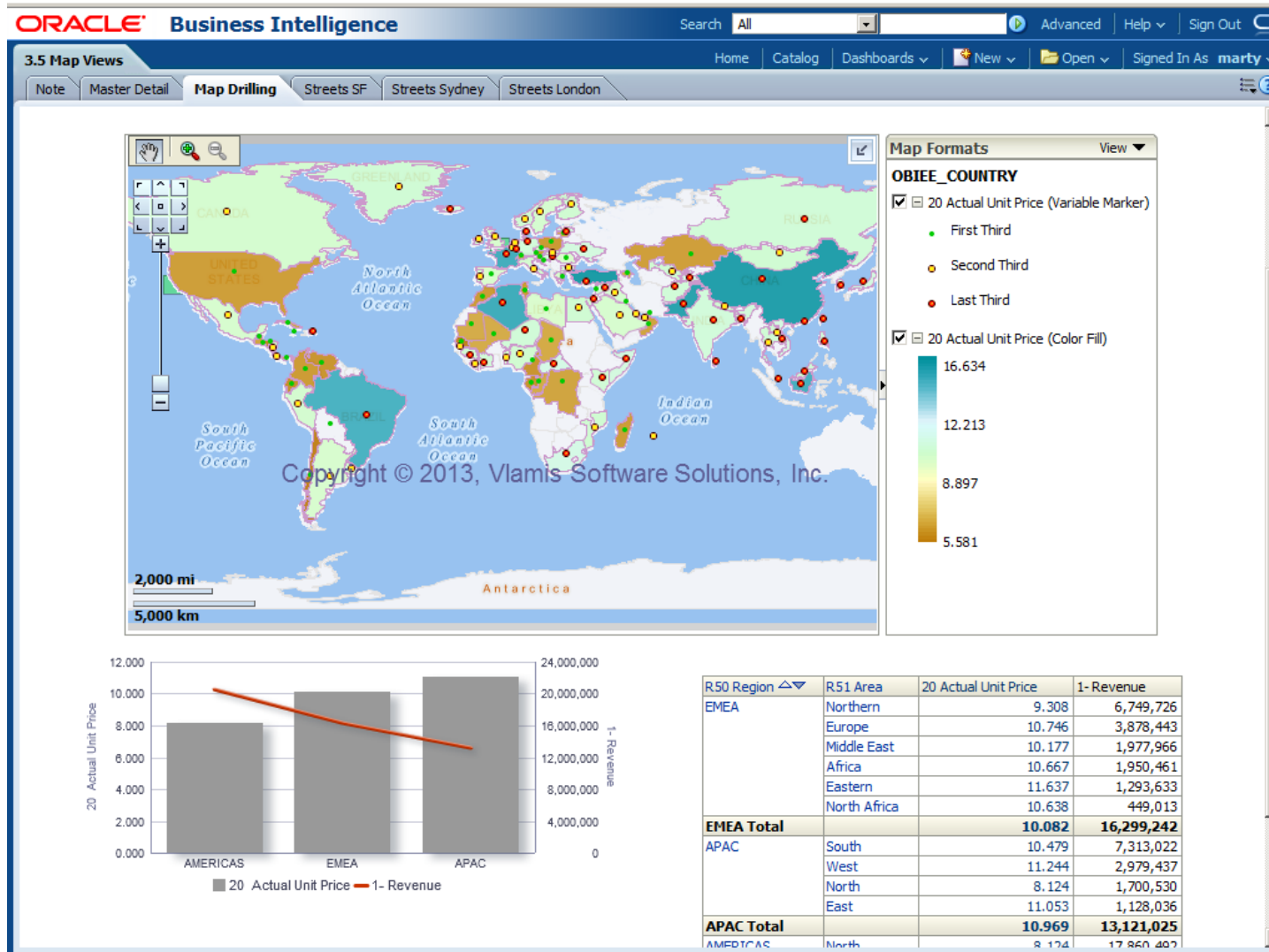
color advice for cartography

[EXPORT YOUR COLORS >>](#)

SCORE CARD

[learn more](#)

Demo of Oracle BI 11g Maps





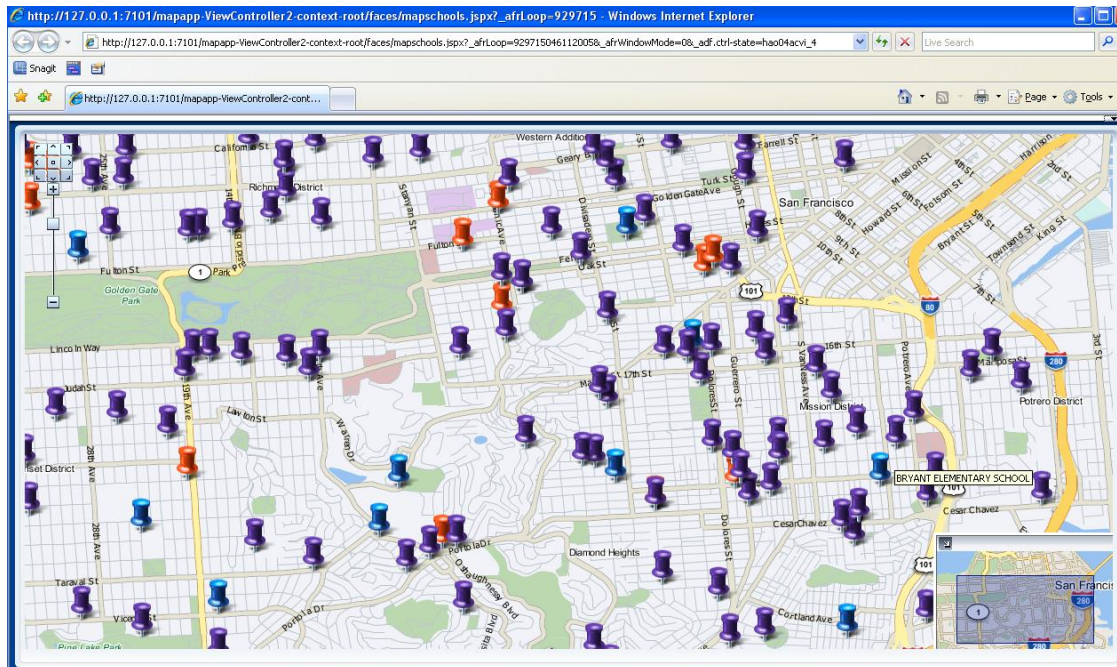
Nokia Location & Commerce Data Formerly NAVTEQ

- 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



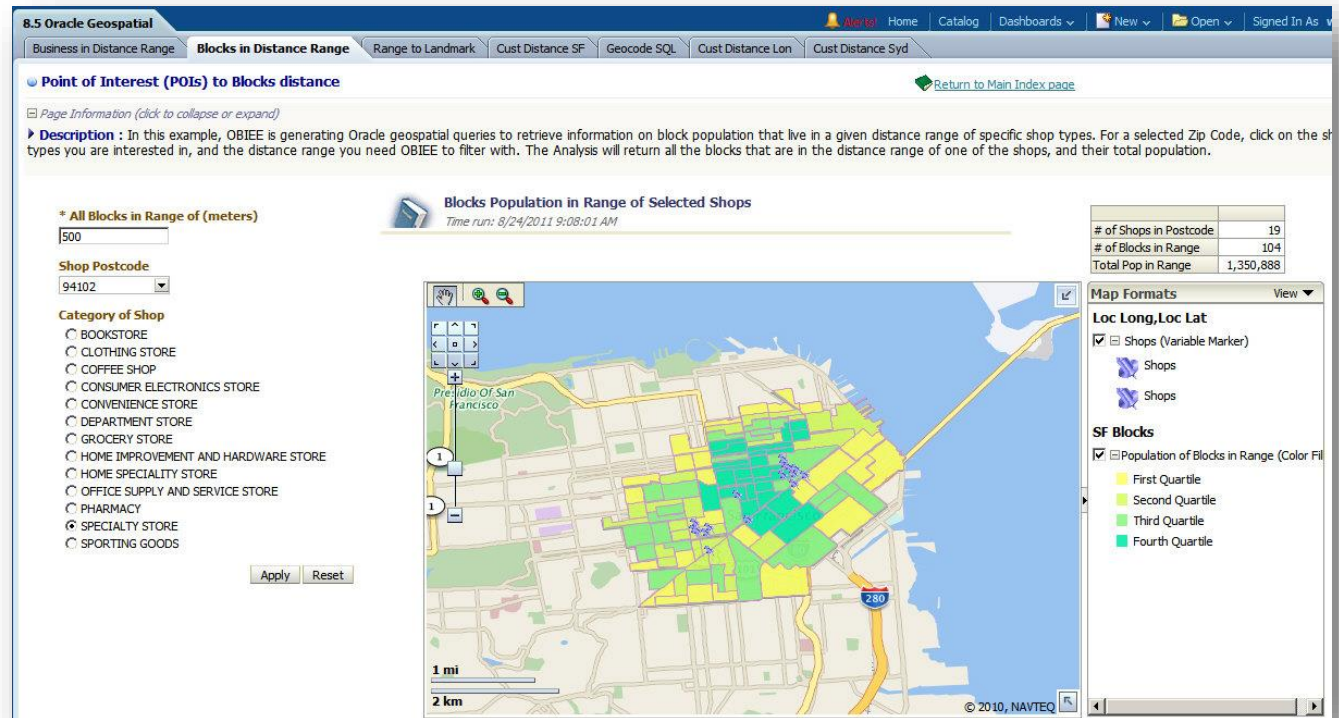
AIRPORT
ALTERNATE FUEL STATION
AMUSEMENT PARK
ATM
ATTORNEY
AUTO DEALERSHIP-USED CARS
AUTO DEALERSHIPS
AUTO PARTS
AUTO SERVICE AND MAINTENANCE
AUTOMOBILE CLUB
BANK
BANQUET HALL
BAR OR PUB
BOATING
BOOKSTORE
BORDER CROSSING
BOWLING ALLEY
BOWLING CENTRE
BUS STATION
BUS STOP
BUSINESS FACILITY
BUSINESS SERVICE
CAMPING
CAR WASH/DETAILING
CARGO CENTRE
CASINO
CEMETERY
CHECK CASHING SERVICE
CHURCH
CINEMA
CITY HALL
CIVIC/COMMUNITY CENTRE
CLEANING AND LAUNDRY
CLOTHING STORE
COCKTAIL LOUNGE
COFFEE SHOP
COMMUTER RAIL STATION
COMPUTER AND SOFTWARE
CONSUMER ELECTRONICS STORE
CONVENIENCE STORE
CONVENTION/EXHIBITION CENTRE



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

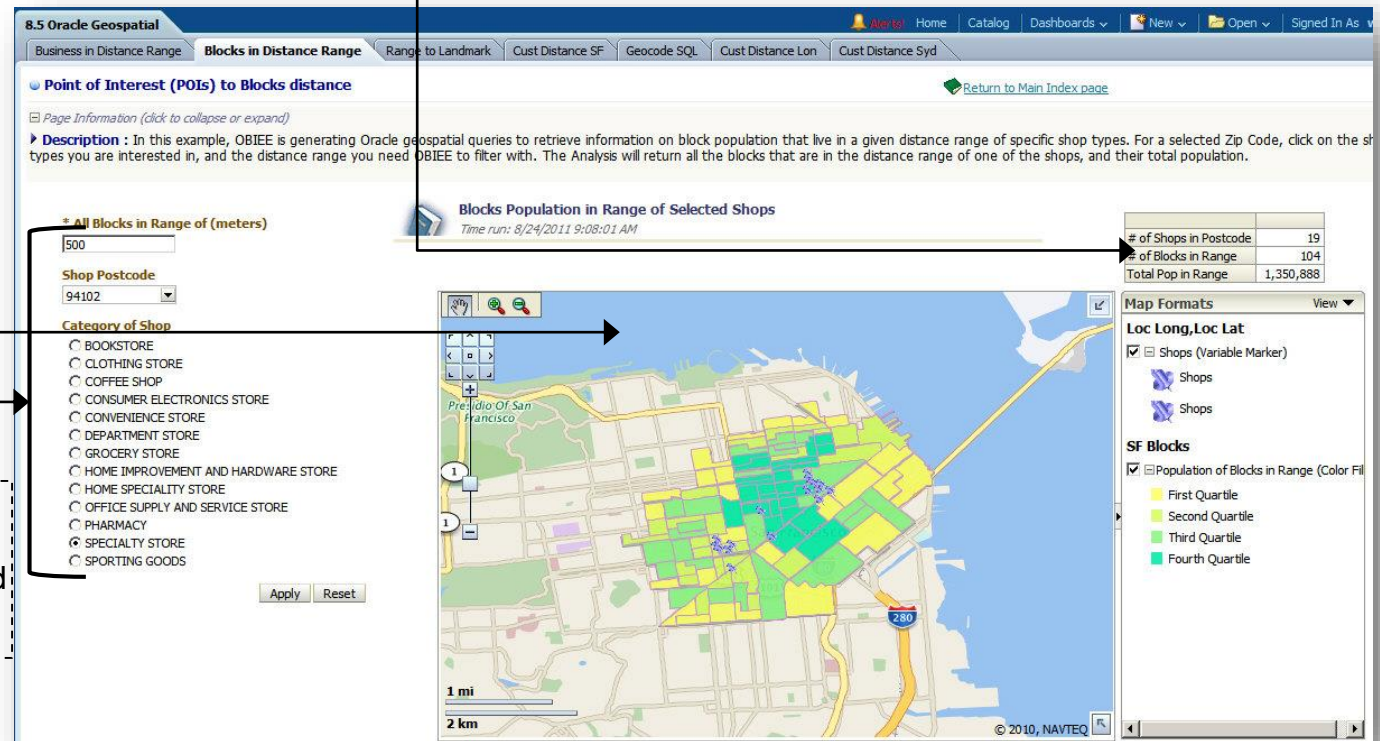
Standard Answers view

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





Deconstructing The Analysis

Prompts, Variables, Opaque Views

Answers Criteria
Columns from Subject Area
(L – Geo Loc)

* All Blocks in Range of (meters)
500

Shop Postcode
94102

Category of Shop

- ☐ BOOKSTORE
- ☐ CLOTHING STORE
- ☐ COFFEE SHOP
- ☐ CONSUMER ELECTRONICS STORE
- ☐ CONVENIENCE STORE
- ☐ DEPARTMENT STORE
- ☐ GROCERY STORE
- ☐ HOME IMPROVEMENT AND HARDWARE
- ☐ HOME SPECIALTY STORE
- ☐ OFFICE SUPPLY AND SERVICE STORE
- ☐ PHARMACY
- ☒ SPECIALTY STORE
- ☐ SPORTING GOODS

Prompts

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

Prompt Label

Page 1

All Blocks in Range of (meters)

Shop Postcode

Category of Shop

Blocks Population in Range of Selected Shops

Criteria Results Prompts Advanced

Subject Areas

- L - Geo Loc
 - POI Details
 - # of POIs
 - POI Id
 - POI Name
 - Full Address
 - Loc Lat
 - Loc Long
 - Country Code 2
 - House Number
 - Municipality Name
 - Postal Code
 - Street Name
 - Blocks in range of POIs
 - Population
 - Income
 - Education Facts
 - Total Pop
 - Households
 - Med Household Income
 - POI Category Name
 - Block Group Id
 - Block Label

Selected Columns

Double click on column names in the Subject Areas pane to add them to the analysis. Once added, drag-and-drop columns to reorder them. Edit a column's properties, filters, apply sorting, or delete by clicking or hovering over the button next to its name.

Blocks in range of POIs | POI Details

Block Group Id | POI Category Name | Total Pop | POI Name | Loc Lat | Loc Long | # of POIs | Full Address

Filters

Add filters to the analysis criteria by clicking on Filter option for the specific column in the Selected Columns pane, or by clicking on the filter button in the Filter pane head saved filter by clicking on add button after selecting its name in the catalog pane.

Add Filters Here.

Edit Prompt: Category of Shop

Prompt For Column: POI Category Name

Label: Category of Shop

Description:

Operator: is equal to / is in

User Input: Radio Buttons

Options

Radio Buttons Values: Specific Column Values

- BOOKSTORE
- CLOTHING STORE
- COFFEE SHOP
- CONSUMER ELECTRONICS STORE
- CONVENIENCE STORE
- DEPARTMENT STORE
- GROCERY STORE
- HOME IMPROVEMENT AND HARDWARE
- HOME SPECIALTY STORE
- OFFICE SUPPLY AND SERVICE STORE
- PHARMACY
- SPECIALTY STORE
- SPORTING GOODS

☐ Include "All Column Values" choice in the list

☐ Limit values by: All Prompts

☐ Require user input

Default selection: Specific Value

SPECIALTY STORE

Set a variable Request Variable

OQS_CATEGORY

Deconstructing The Analysis

Physical Table - V_POI_Block_Group

General | Columns | Keys | Foreign Keys

Name: V_POI_Block_Group

Table Type: Select

☐ Default Initialization String ☒ Use database specific SQL

Database: Oracle 11g

Initialization String:

```
select distinct
b.id as block_group_id,
s.poi_id as poi_id,
d.name as category_name
from
block_group b,
ntc_map_poi_shop s,
ntc_meta_poi_cat_ref d
where
s.iso_country_code='USA' and
s.cat_id = d.cat_id and
d.name = 'VALUEOF(NQ_SESSION.OGS_CATEGORY)' and
s.poi_postcode = 'VALUEOF(NQ_SESSION.OGS_POSTCODE)' and
sdo_within_distance(
b.geometry, s.geometry, 'distance=VALUEOF(NQ_SESSION.OGS_DIST_M)'
)= TRUE
```

Session Variables

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

Variable Manager

Session Variable - OGS_ADDRESS

Name: OGS_ADDRESS

☒ Enable any user to set the value

☐ Security Sensitive

Initialization Block:

Default: DUAL ADDRESS VALUE = FIXED ADDRESS

Default: 747 Howard St, San Francisco, CA 94103, US

Description: Used for Geospatial interaction examples

Business Model and Mapping

Physical

10 - BI Publisher Audit

10 - System DB (ORCL)

11 - Sample Geo Loc

OBIEE_NAVTEQ

BLOCK_GROUP

GC_POI_NA

NTC_META_POI_CAT_R...

CAT_ID

TABLE_NAME

V_POI_Block_Group

block_group_id

category_name

poi_id

V_POI_In_Range_Business

cat_id

name

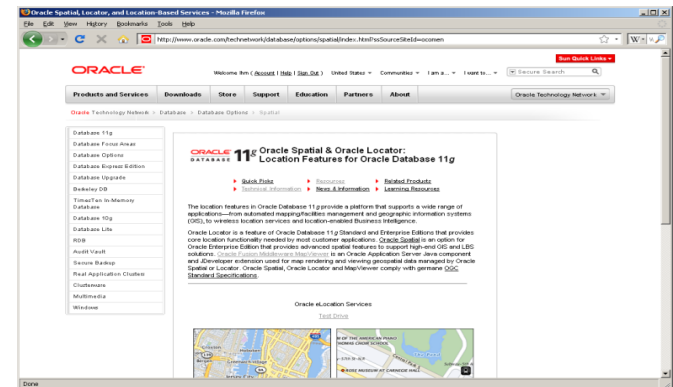
POI_id

Opaque View

Parameterized SQL utilizes Oracle Spatial function (**sdo_within_distance**) to perform spatial analytics

For more information

- Oracle Business Analytics: oracle.com/bi
 - @OracleAnalytics
 - @OracleBITech
 - www.youtube.com/evolvingBI
- Oracle Spatial and Graph Resources:
 - www.oracle.com/technetwork/database/options/spatialandgraph/spatial
White papers, downloads, case studies & more
 - IOUG Spatial and Graph SIG
 - @oracledatabase
 - 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!

Thank You for Attending Session **Using Maps and Geo Spatial Analytics in Oracle Business Intelligence 11g**

Presenter Information

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