

Oracle Business Intelligence 11g

Oracle BI and Geo-Spatial Big Data

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**Oracle
Spatial
Summit**
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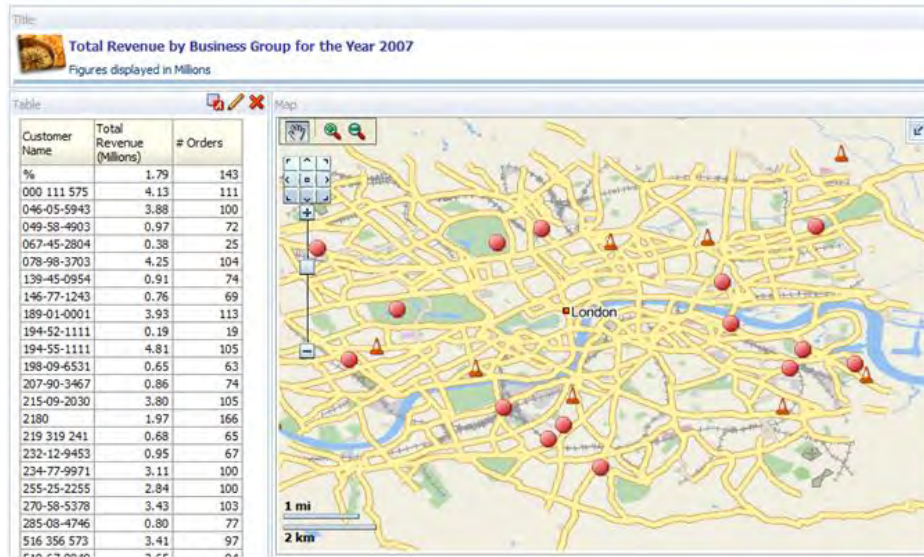
Oracle BI and Geo-Spatial Big Data

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- Demonstration
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Oracle BI and Geo-Spatial Big Data

Introduction

- A lot of Organisations have implemented Maps within Oracle BI
- For example: Plotting sales by Customer on a map
 - How much value does this really add?
 - Does it enable you to make better decisions or is the map just an alternative to a bar chart?



Oracle BI and Geo-Spatial Big Data

Introduction

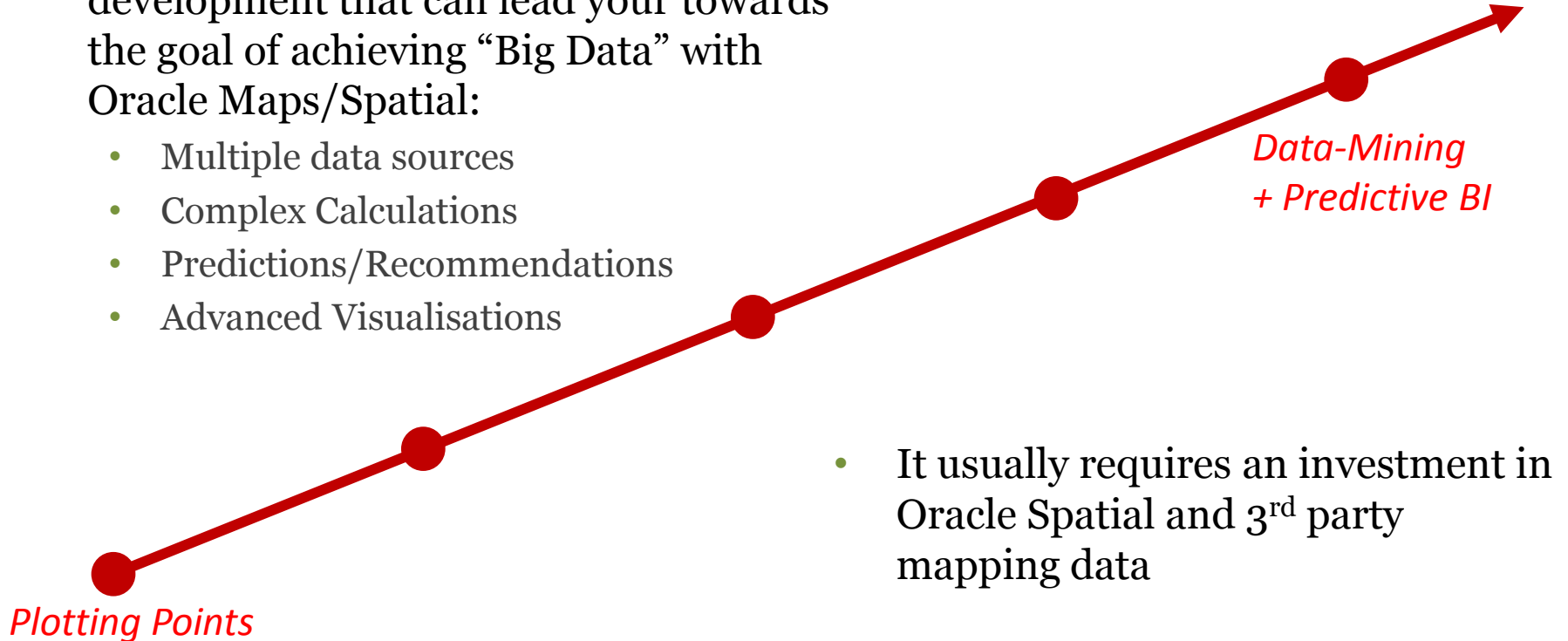
- An increasing number of Organizations are reaching a point of maturity in their Business Intelligence projects:
 - A need to get more value out of the historical data accumulated
 - A desire to attain a greater return on investment
 - Transform BI into a tool that enables more effective decision making
 - Increase levels of User Adoption through improved analytical capability
- The combination of Oracle BI and Oracle Maps/Spatial opens the door to maximising the potential of your BI implementations

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Aim of Presentation

- This presentation outlines 5 stages of development that can lead your towards the goal of achieving “Big Data” with Oracle Maps/Spatial:

- Multiple data sources
- Complex Calculations
- Predictions/Recommendations
- Advanced Visualisations



- It usually requires an investment in Oracle Spatial and 3rd party mapping data

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Step 1 – Choose Map Provider and Plot Existing Geometries

- Starting from scratch, the first key decision is choosing a provider for your background maps. There are a variety of choices including:



HERE (formally NAVTEQ & Nokia) provide global digital maps down to postcode level
There are a variety of further options available, include the ability for “Routing” maps and “Geo-coding” data
HERE maps can be stored in your own Oracle database, or a public Mapping server is available with APIs



GfK GeoMarketing deliver global digital maps detailed down to major roads and highways.
Geometries provide the administrative boundaries in every country (usually down to 4th postcode digit)
Further options include detailed “Purchasing Power” and “Population” marketing data in every country



Google Maps is a publicly & very popular available mapping service (licenses are required for private use)
Many APIs are available e.g. routing, points-of-interest (POIs). Lots of potential but requires custom code
Many interactive features and additions provided by Google e.g. StreetView

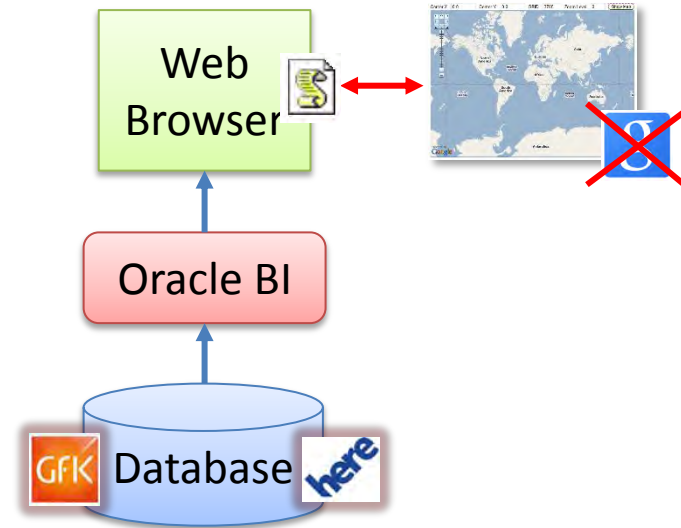


Oracle BI and Geo-Spatial Big Data Step 1

Oracle BI and Geo-Spatial Big Data

Step 1 – Choose Map Provider and Plot Existing Geometries

- Whilst mapping services such as Google maps are very popular, the APIs are typically for “operational” purposes e.g. choosing the best route
- If your goal is “big data”, we recommend against the use of mapping services as there are restrictions both in terms of architecture and usage limits
- It is better to load digital mapping data into your Oracle Database and perform all your processing in one place, you also benefit from all the power of the Oracle Database and Oracle Spatial

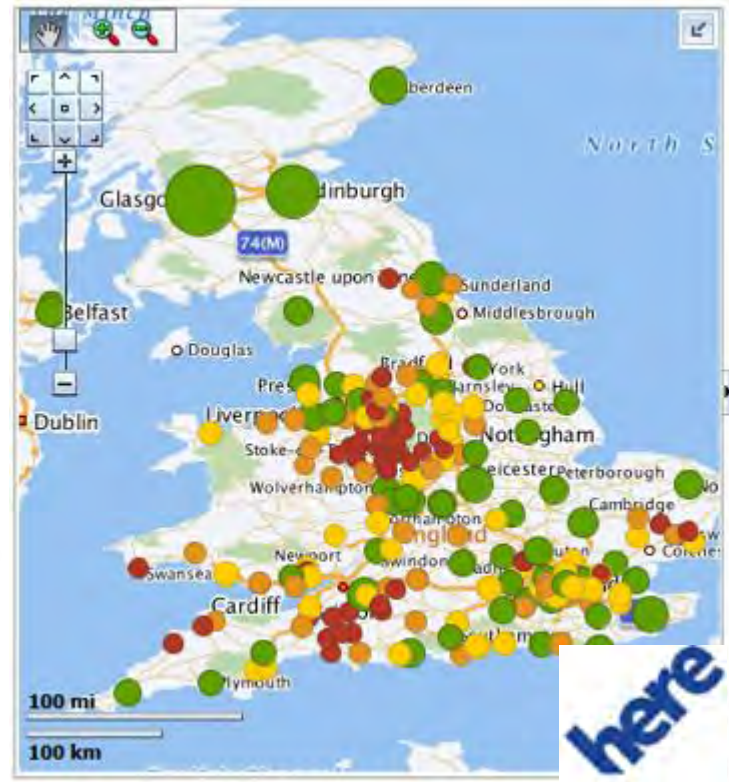
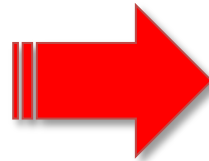


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Step 1 – Choose Map Provider and Plot Existing Geometries

- Example 1:
 - You may have the lat/long coordinates of each of your stores or office locations
 - These can be plotted directly on a map

Store Name	Order Amount
1. Gordon Street	654804.86
10. Uttoxeter Road	493.19
100. High Street	18473.81

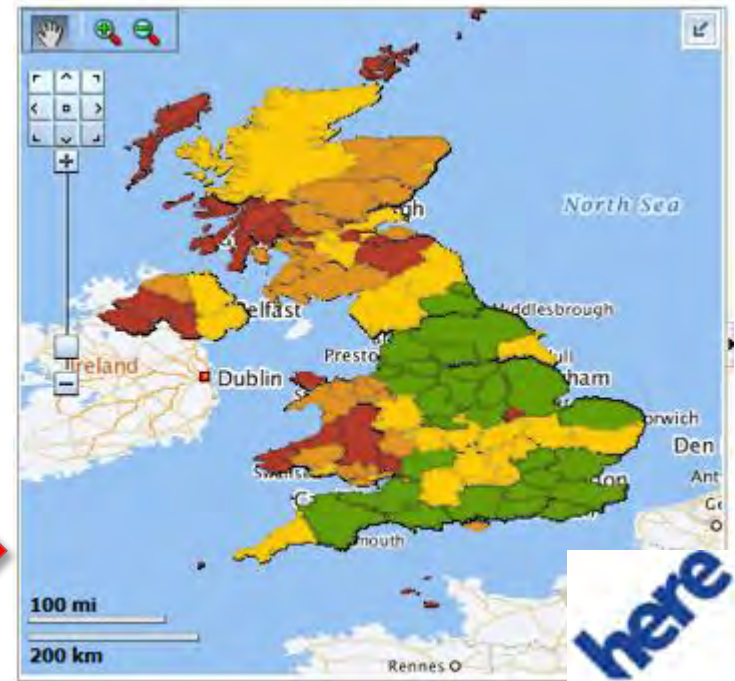
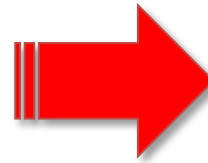


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Step 1 – Choose Map Provider and Plot Existing Geometries

- Example 2:
 - Mapping providers will provide many “layers” of geometries with their digital map data
 - For example: Reporting “Sales by County” where your “County” values match up to those provided by HERE

County	Order Amount
Aberdeenshire	52867.66
Angus	29318.46
Argyll and Bute	22019.07
Bedfordshire	135985.69

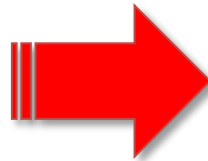


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Step 1 – Choose Map Provider and Plot Existing Geometries

- **Example 3:**
 - If you have access to postcodes, you can make use of the administrative boundary geometries provided by GfK Geomarketing
 - Example Postcode: **AB20 1BF**

Postcode Area	Order Amount
AB	124371.03
AL	74611.63
B1	69349.62
B2	62639.03
B3	57104.58
R4	42339.88

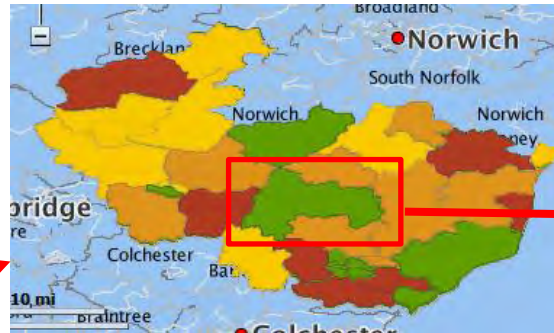


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Step 1 – Choose Map Provider and Plot Existing Geometries

- **Example 3:**
 - There are 3 levels of drill-down through the postcode hierarchy: Postcode Area > District > Sector
 - The drill-down is automated within Oracle BI

Postcode Area	Postcode District	Postcode Sector	Order Amount
AB	AB10	AB10 1	6985.99
		AB10 6	2826.38
		AB10 7	2425.95
AB11	AB11	AB11 5	545.11
		AB11 6	2638.16
		AB11 7	263.66
		AB11 8	2185.73
		AB11 9	2452.93
		AB12	AB12 3





Oracle BI and Geo-Spatial Big Data Step 2

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Step 2 – Build/Generate New Geometries

- A lot has already been achieved with Step 1, but there is a lot more that can be done!
- So far, we've only been using the geometries we already had or were provided as part of the digital map data
- Now we can look at building new geometries out of the tools and data available, for example:
 - **Spatial Aggregation:** forming bigger “region” geometries
 - **Geo-Coding:** Obtaining the precise location of each customer
 - **Clustering:** Oracle Spatial functions to build geometries around customer clusters

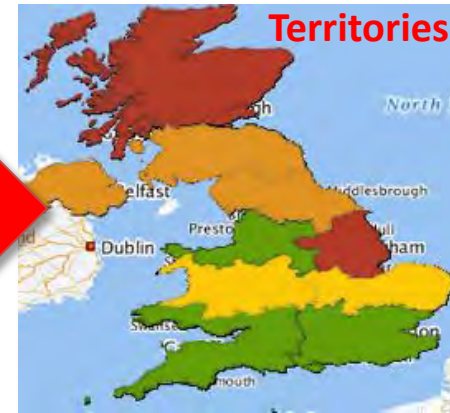
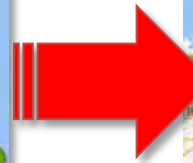
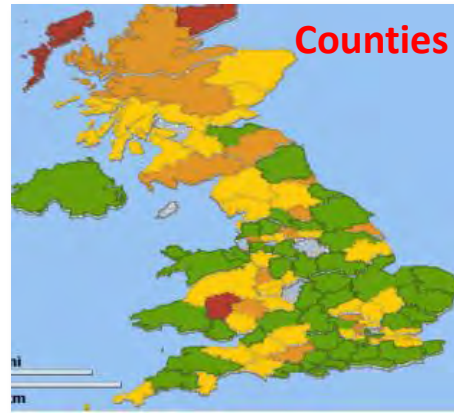
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Step 2 – Build/Generate New Geometries

- **Spatial Aggregation**

- Generating larger regions by “aggregating” your existing geometries
- Example: Forming custom “Sales Territories” from multiple “Counties”
- These geometries can be generated using a single SQL statement
 - (you can “sum” geometries together just like you can “sum” sales data)

Sales Territory	County	Order Amount
Territory 1	Berkshire	188199.36
	Buckinghamshire	202825.25
	East Sussex	259721.84
	Essex	436240.10
	Hampshire	454283.93
	Hertfordshire	292083.47
	Isle of Wight	53548.65
	Kent	465851.70
	London	1911942.49
	Oxfordshire	169862.47
	Surrey	333812.93
	West Sussex	254410.75
	Territory 2	Blaenau Gwent
Bristol		127663.47



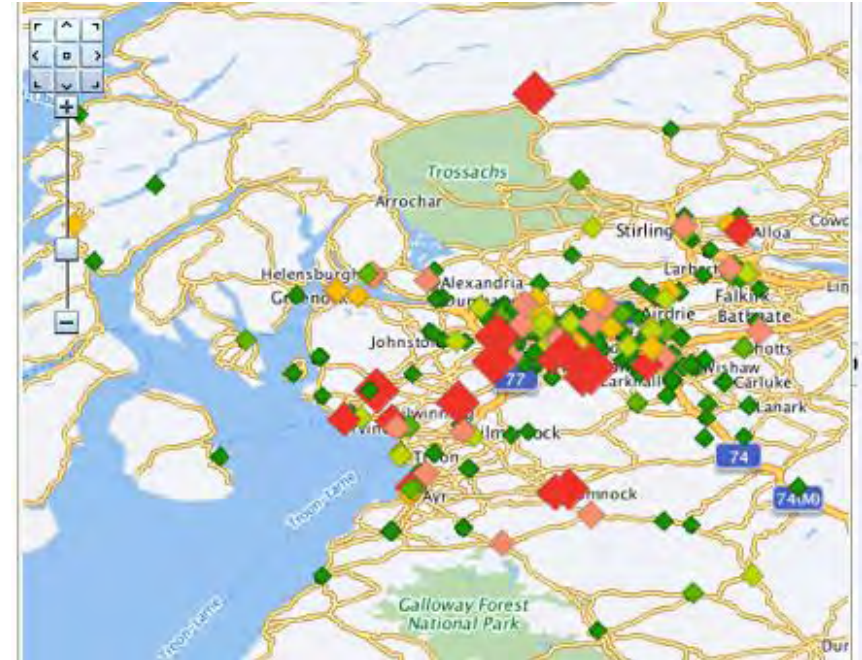
Sales Territory	Order Amount
Territory 1	5022782.94
Territory 2	2064084.12
Territory 3	1134720.23
Territory 4	1447523.72
Territory 5	866441.17
Territory 6	2481389.67
Territory 7	1065788.53
Territory 8	939606.81
Territory 9	492261.60

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Step 2 – Build/Generate New Geometries

- **Geo-Coding**

- Converting customer addresses into actual lat/long locations so they can be rendered on a map
- In the example shown, we are plotting customers located within 100km from a specific store



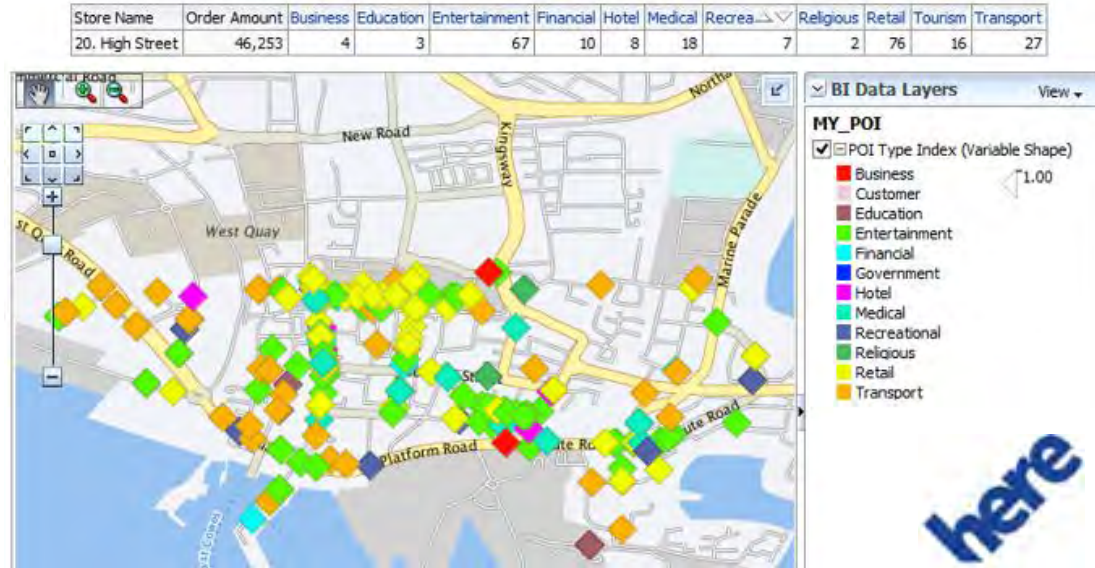


Oracle BI and Geo-Spatial Big Data Step 3

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Step 3 – Advanced Spatial Analysis

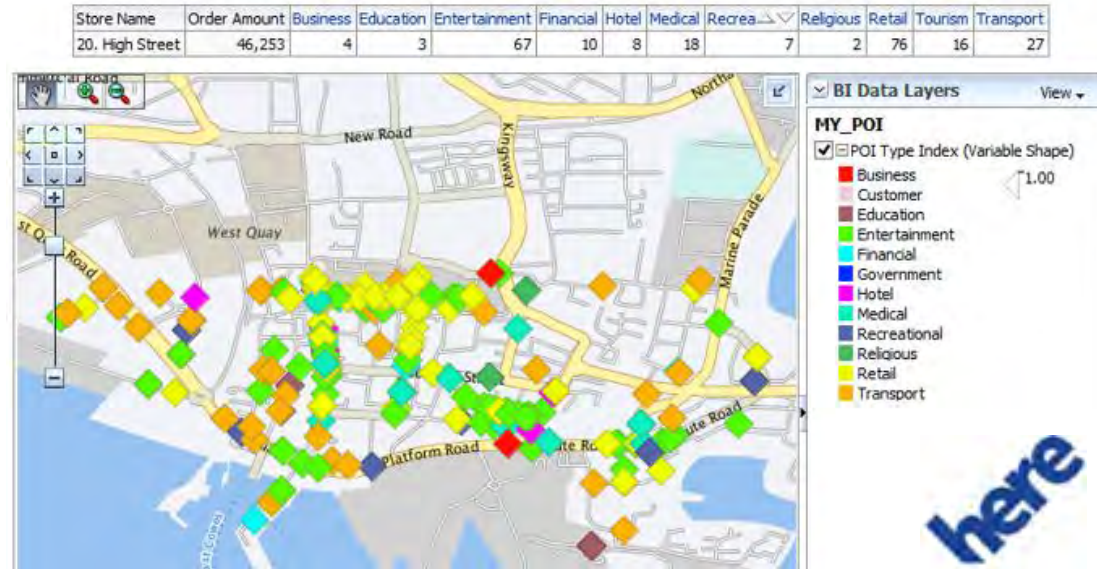
- **HERE** digital maps provide all the “Points of Interest” (POIs) covering businesses, services, retail, government, recreational/sports etc
- You can use this data for location intelligence, for example:
 - Display all the POIs located within 1km of a retail outlet
 - The POIs can be compared with other retail outlets that performed better / worse



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Step 3 – Advanced Spatial Analysis

- Spatial Analysis is possible because of the many spatial functions/operators within in the Oracle Database
- Many of the DB functions are classed as “Locator” features which do not require a license for Oracle Spatial
- However, purchasing Oracle Spatial is advantageous due to the “**vector acceleration**” feature which can significantly improve performance



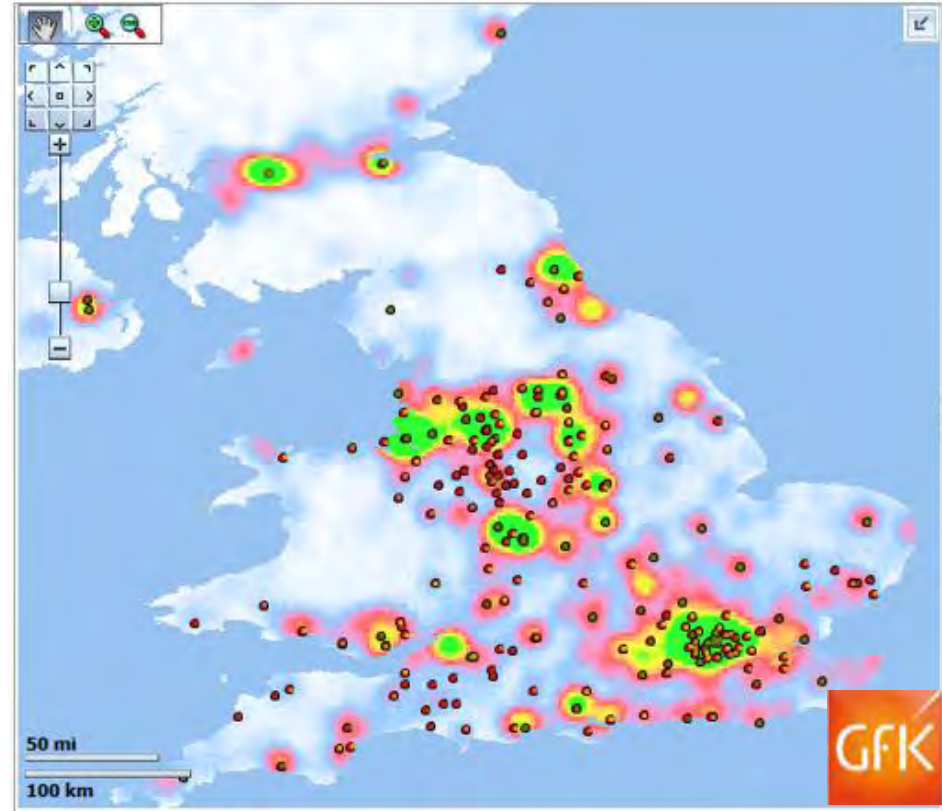


Oracle BI and Geo-Spatial Big Data Step 4

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Step 4 – Incorporate 3rd Party Data

- Incorporating 3rd party data can take your implementation to a whole new level
- For example, this map shows “purchasing power” marketing data from Gfk Geomarketing rendered as a **Heat Map** layer within Oracle BI
- For example, you can analyse sales and even choose new store locations based on:
 - Purchasing Power
 - Number of Households
 - Population Densities



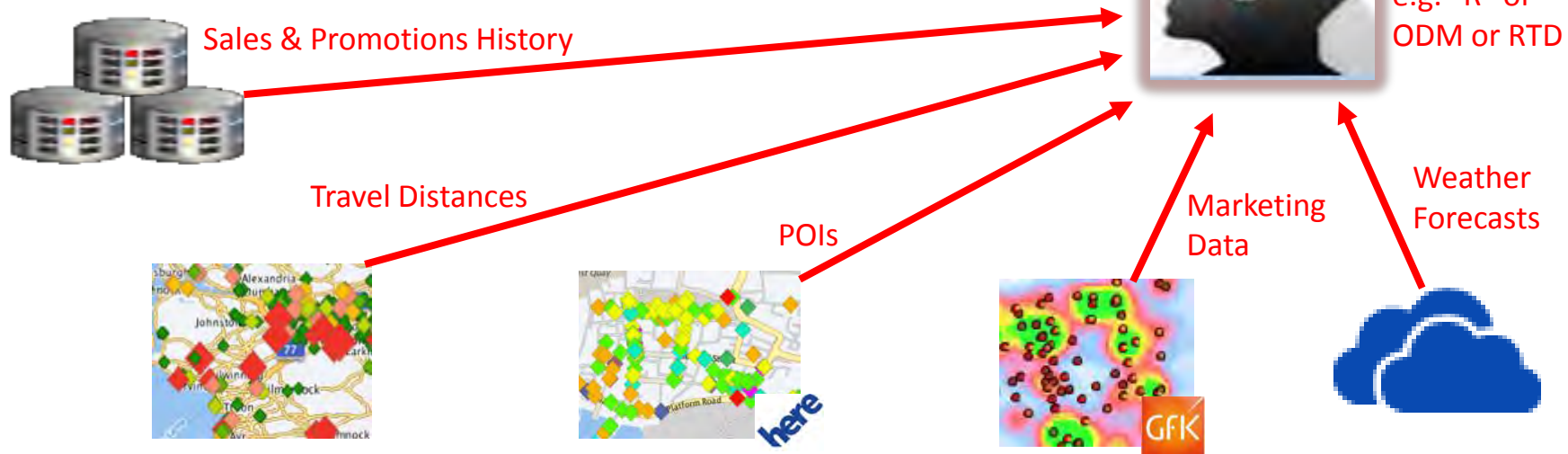


Oracle BI and Geo-Spatial Big Data Step 5

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Step 5 – Data-Mining & Predictive BI

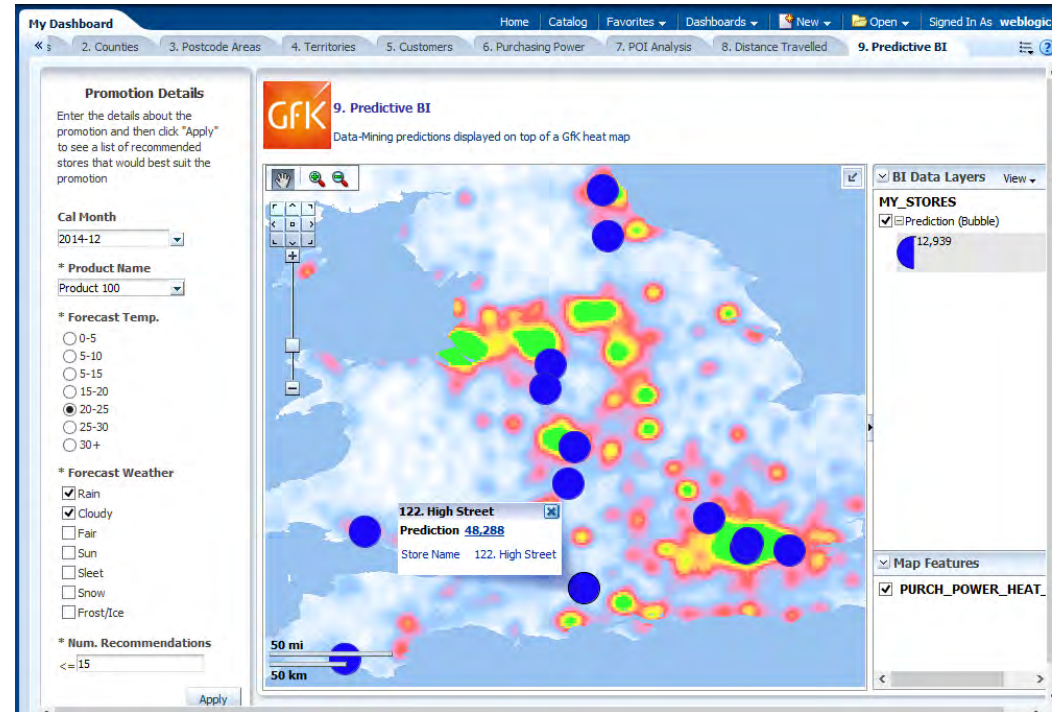
- Now that you have all this data at your disposal, you can use it with a data-mining engine to discover hidden patterns in your data and make predictions + recommendations



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Step 5 – Data-Mining & Predictive BI

- In this example dashboard, Oracle BI will recommend the best stores to use to drive a new promotion or marketing campaign
- A “predictive model” has learnt the correlations between weather forecast, the time of year, product sales and promotion sales in each store
- The predictive model and then recommends the best store locations for a new promotion



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Summary

- Oracle BI and Oracle Maps/Spatial can add long-term value to your Business community
- To realise the full benefits, be prepared to purchase Oracle Spatial, 3rd party map data and 3rd party marketing data
- Try to do more than just plot data on a map – use the map data to its full potential (POI analysis etc)
- Keep your spatial processing within the Oracle Database, avoid the use of external hosted mapping services / APIs for performing batch spatial operations

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Further Information

- Please contact us, visit our web-site or blog:
 - Email: enquiries@peakindicators.com
 - Web: www.peakindicators.com
 - Blog: <http://www.peakindicators.com/index.php/knowledge-base>
- Peak Indicators 2 day training: [Oracle BI 11g “Advanced” Spatial](#)
- In the US our training partner is RedPill Analytics:
 - <http://training.redpillanalytics.com>

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