White Paper: "Working with digital maps and geodata in Oracle applications"

Digital maps and geodata are the foundation of all spatial features and analyses in Oracle products. Oracle users can enrich their data by using a spatial approach: Spatial analyses provide insight into data trends and relationships that would otherwise remain hidden.

This white paper gives Oracle users some guidelines on how to make the most of their data´s spatial dimension, from geocoding and visualizing customers´ locations and performing spatial queries such as assessing the number of customers within a certain catchment area to carrying out more complex tasks such as sales territory planning and controlling.

by GfK GeoMarketing, ORACLE Silver Partner

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Oracle tools and platforms offer an increasingly wide range of options for performing spatial analyses. With digital maps as their foundation, these spatial analyses of company data give users more efficient operations and improved transparency.

As the leading provider of worldwide digital postcode and administrative maps, GfK GeoMarketing has compiled this white paper to give Oracle users an overview of how to work with such digital maps in Oracle applications and the results that can be achieved.

Why postcode maps?

Postcode maps link data to locations

Eighty percent of a company's data shares a common place-based component: postcodes. These are contained in the addresses of customers, business locations and competitors, among others. In all likelihood, this data is already present in every Oracle user´s database, which means it can be effortlessly visualized on postcode maps. These are special digital maps that depict postcode boundaries and geographic information such as the coordinates of each postcode´s center point. Each postcode region corresponds to a precise map object with a unique identification code, the data of which is stored in a table associated with the postcode map. Due to the inclusion of this integrated data, digital maps are often referred to as "geodata". Users working with these maps can use this integrated data to link the maps to their own data and then visualize the results.

Postcode maps, or geodata, are accordingly integrated into Oracle spatial tools where they serve as the link between data and locations. This allows Oracle users to enhance their own data with spatial analyses and visualize the results directly on the detailed digital maps.

Many other types of useful digital maps are available, such as those depicting administrative boundaries. The basic principle of associating data with locations via a geographic regional code of some sort remains the same. Postcodes are simply the most common and convenient way to do this. The question of which geographic unit to use depends on the data available.

GfK GeoMarketing provides all possible types of digital maps suitable for spatial analyses, including postcode and administrative maps as well as specialty maps for specific branches such as the reinsurance (CRESTA Zones) and pharmaceutical industries. All of GfK GeoMarketing´s maps can be paired together seamlessly, without gaps or overlaps. Also, all of the analysis possibilities described for postcode maps can be carried out with any other geographic unit.

Applications of spatial queries/analyses

Some examples of how to use maps and spatial analyses in Oracle

Geocoding and displaying customers´ locations

One of the simplest and most valuable spatial analyses is the so-called "geocoding" of information. For example, data on customers, turnover and branch locations can be precisely pinpointed on maps by using the match between the postcodes contained in addresses and the postcodes in the digital maps. This link effectively "geocodes" the Oracle user's data, allowing it to be analyzed and visualized directly on the postcode maps.

This simple procedure gives Oracle users a wealth of new possibilities and is the blueprint for achieving greater efficiency and exploiting untapped potential. Once it's known where customers are located and the amount of turnover generated by each sales region, weaknesses and gaps in the current network can be immediately spotted. It´s difficult or even impossible to see this in a database or spreadsheet, but it leaps out when displayed on digital maps. Once users have displayed and analyzed their customers and sales structures on digital maps, they can further enhance their analyses by incorporating external market data on regional potential.

Spatial queries

By utilizing an Oracle database that supports spatial- and object-related queries and analyses, users can regionally filter the postcode regions contained in the database according to precise search criteria. For example, all customers within a specific radius responsible for a certain level of turnover can be located. Also, users can determine the turnover share contributed by a specific branch office and its catchment area. Users can also establish the total number of customers within multiple sales territories and then compare this number to the untapped potential within a given territory.

This type of analysis is impossible without a geographic component such as postcodes. By capitalizing on this geographic link, Oracle users have a powerful tool for measuring regional potential and planning successful locations and marketing campaigns.

Sales territory planning and controlling

Sales territories can be planned and optimized on the basis of postcode regions as well as data on turnover, sales representative performance and market potential. A spatial approach to planning sales regions is important in order to create balanced sales structures that feature a fair distribution of customers, potential and workload for external sales teams. Here, as elsewhere, granular postcode boundaries comprise the ideal basis of such planning activities: Larger sales regions can be defined by aggregating data associated with the finer levels until the desired sales region capacity is achieved and the regions are adequately balanced. The spatial analyses tools in Oracle make it possible to perform these calculations and then view the results directly on digital maps. This leads to more transparency and thus greater acceptance by those affected by the sales reforms.

Results of any sales restructurings can later be analyzed on a postcode-by-postcode basis. This gives Oracle users who work in controlling departments an objective tool for measuring turnover results and sales performance within each territory. The map analyses thus provide concrete insight into whether the restructuring was successful and where additional adjustments may still be necessary.

The geo-factor is the next generation of business intelligence

Other spatial analysis options include using company and market data to compare regional turnover to the level of potential in these same areas and then plan targeted, region-specific marketing campaigns. This approach also makes it easy to determine the level of potential in the sales territories and identify any possible cannibalization effects. Data on competitor locations can be used to locate the best areas for new business sites or postcodes in which current customers are at a high risk of being poached by a rival company.

The examples above only scratch the surface of the potential applications for spatial analyses in Oracle. The ideal cartographic basis is available for every type of spatial analysis, however complex or unique.

How to integrate maps in Oracle

Oracle's spatially enhanced environment

The availability of GfK GeoMarketing's maps in the Oracle format gives Oracle users the ability to choose from among maps of 240 countries for immediate integration into their software. GfK GeoMarketing's digital maps can be used in conjunction with Oracle Business Intelligence 11g and Oracle Fusion Middleware MapViewer, a standard feature of every edition of Oracle WebLogic Application Server, and Oracle MAPS JavaScript library, a feature of MapViewer. The maps can also

be integrated in a variety of Business Intelligence (BI) and geographic information system (GIS) tools, many of which can be individually customized and fused with Oracle technology.

The addition of spatial intelligence tools to Oracle's trademark solutions is transforming databases from linear repositories of information to dynamic and fluid collections of data that can be linked and analyzed in myriad ways in order to generate new insights.

Quality requirements of maps /geodata

Getting the most mileage out of data

While using postcodes to connect and extract insight from data is relatively straightforward, not all postcode maps are created equally. In order to seamlessly associate data with maps on the basis of postcodes, digital maps should feature flawless coverage of the postcode *boundaries*. The polygons corresponding to the boundaries need to fit together without gaps or overlaps if data is to be associated with the maps correctly.

Another important point is that postcode boundaries undergo constant revision due to territorial changes and postal system reforms. For example, thousands of changes occurred to Europe's postcode boundaries last year alone. If data is to be accurately associated with the maps, these boundaries must reflect the latest status. Otherwise, errors occur and the results of any analyses will not be nearly as useful or reliable.

Another crucial factor is the level of detail: The finer the regional resolution, the more detailed users´ analyses will be. Less detailed boundaries limit users to generalized comparisons of their data and make it impossible to plan operations, analyze performance and gauge the status of their current networks at a granular level. All boundaries and layers should also fit together seamlessly without gaps or overlaps.

Other important digital map components include local and national place-name attributions, supplementary topographic details and vector-based digitization.

Free Oracle map sample

GfK GeoMarketing has created a map of the world's postcode systems in an Oracle-compatible format. The map is available as a free sample and demonstrates the high quality and worldwide coverage of GfK GeoMarketing's maps. The free map can be downloaded at www.gfk-geomarketing.com/oracle-sample.

About GfK GeoMarketing

GfK GeoMarketing offers the world's largest collection of digital administrative and postcode maps, with coverage of 240 countries. The company is one of the largest providers of geomarketing services in Europe for customers and users from all branches of trade. Key business areas include:

- Consultancy
- Market data
- Digital maps
- Geomarketing software RegioGraph

GfK GeoMarketing is a subsidiary of the globally active GfK Group.

For more information

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