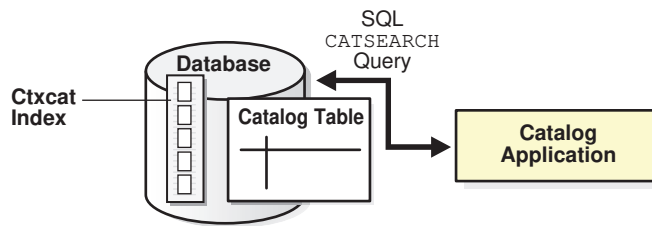**Figure 19-4   Catalog Query Application**

> **See Also:**
>
> - *Oracle Text Application Developer's Guide* and *Oracle Text Reference*
> - *Oracle XML DB Developer's Guide* to learn how to perform full-text search over XML data

Overview of Oracle Spatial and Graph

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Oracle Spatial and Graph (Spatial and Graph) includes advanced features for spatial data and analysis and for physical, logical, network, and social and semantic graph applications.

The spatial features provide a schema and functions that facilitate the storage, retrieval, update, and query of collections of spatial features in an Oracle database. An example of spatial data is a road map. The spatial data indicates the Earth location (such as longitude and latitude) of objects on the map. When the map is rendered, this spatial data can project the locations of the objects on a two-dimensional piece of paper. A geographic information system (GIS) can store, retrieve, and render this Earth-relative spatial data. When an Oracle database stores this spatial data, you can use Spatial and Graph to manipulate and retrieve this data, and relate this data to other data.

> **See Also:**
>
> *Oracle Spatial and Graph Developer's Guide*

- Support for sharded databases with spatial data types

- More spatial web services features for scalability and usability

RDF SEMANTIC GRAPH TRIPLE STORE FEATURES IN ORACLE SPATIAL AND GRAPH

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The RDF Semantic Graph feature of Oracle Spatial and Graph is a special purpose graph for linked data and semantic web applications conforming to World Wide Web Consortium standards, common in health sciences, finance, media, and intelligence communities. Oracle delivers advanced RDF Semantic Graph data management and analysis with native support for the Resource Description Framework (RDF) and Web Ontology Language (OWL) standards for representing and defining semantic data and SPARQL, a query language designed specifically for graph analysis. Application developers benefit from the industry's leading open, scalable graph data platform and its fine-grained security.

Application developers can add meaning to data and metadata by defining a set of terms and the relationships between them. These sets of terms ("ontologies") enable query, analysis and actions based on semantic content, rather than simply data values. Ontologies are used to build applications that utilize domain-specific knowledge. Ontological data sets, often containing 100s of millions of data items and relationships, can be stored in groups of three, or "triples" using the RDF data model. Oracle enables scaling to billions of triples to meet the needs of the most demanding applications.

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RDF graph analysis enables discovery of relationships across data sets and documents and integration and access by applications to systems with disparate metadata.

Oracle Spatial and Graph RDF Semantic Graph features include:

- RDF Views on Relational Tables removing the need to duplicate data and the associated storage previously required to perform RDF graph queries on relational data sets. Semantic graph queries on RDF views can integrate relational data and RDF Semantic Graph triple data stored in Oracle. Semantic queries on these views can be written in the SPARQL query language or by embedding SPARQL in an Oracle SQL SEM_MATCH table function.

- RDF Semantic Graph "Named Graph" support as defined by the World Wide Web Consortium (W3C).

- Support for Analytic Operations and Tools. RDF Semantic Graph supports SPARQL 1.1 path expressions for simple and complex paths. RDF Semantic Graph can also be used in conjunction with the Network Data Model Java API to provide fast in-memory graph analytics, including shortest path, reachability, within-cost, and nearest-neighbor analysis of RDF graphs. Results from graph queries can be materialized as views for use with Oracle Advanced Analytics to enable the use of Oracle Data Mining clustering, classification, regression, anomaly detection, and decision tree algorithms as well as Oracle R Enterprise algorithms.

- RDF Semantic Graph support for schema-private semantic networks.

- Support for XML Schema, Text and Spatial Data Types to add, drop, and alter data type indexes and to enable the filtering of semantic queries written in SPARQL or SQL using XML schema, text, and spatial attributes.

- RDF Semantic Graph document indexing Enhancements:

  - Batch indexing of documents.

  - Flexible framework for managing entity extraction engines and associated rules.