

WHITE PAPER

# Natural Language Query features

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## INTRODUCTION

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When using natural language to ask questions of Insight Advisor, follow the guidelines below for the best results.

### Ask Simple Questions

Insight Advisor can answer simple questions involving fields, dimension and measures in your application. It cannot:

- infer your meaning if you do not reference the fields in the model directly. For example, if you ask “Show me the bids we won”, Insight Advisor will not understand the term “we won”. Instead, you should ask “show me bids where win\_flag = true”.
- correct your spelling. You can use the dropdown list, however, as you are typing your question to pick the exact field, dimension or measure you want to use.
- perform a fuzzy match on field values. For example, “give me customer name that start with ‘SA’” will not work.
- sort values in an analysis (e.g., show me sales by Customer and sort them in descending order), unless it is by rank in a bar chart

For better results, you should use simple phrases and omit articles (a/an/the).

### Voice Input

For users of the Google Chrome browser, we have enabled the built-in voice recognition capabilities of that browser. You can select the microphone icon and ask your question by voice.

### Auto-complete for values

As user types in the question, auto-complete drop-down appears with the list of matching field or master items names as well as the data values. For a read-only user only master items and the values for master items will appear in the auto-complete drop-down. If master item is a drill-down, there will be no match on the values.

## Measures & Dimension Synonyms

Insight Advisor recognizes the measures, dimensions, and fields that are defined in your Qlik Sense application. For example, if you ask “what are my sales”, and your data model contains a measure named “revenue”, Insight Advisor will not know that these are synonyms.

You can augment your application by adding synonyms to master items. In the example above, if you add the tag “alt:sales” to the revenue master measure, Insight Advisor will then recognize sales as a synonym of revenue.

You can also add tags to fields that are not master items by tagging them in your load script in the Data Load Editor. For example:

```
tag field Revenue with 'alt:sales';
```

You cannot provide synonyms for data values unless you create a lookup table in your data model.

## Master Items vs Fields

There are some differences in behavior between fields and master items.

Fields	Master Dimensions	Master Measures
Synonyms are defined in the Qlik script and take effect after you reload the application.	Synonyms can be defined in the Sense Client UI and take effect after a browser refresh.	Synonyms can be defined in the Sense Client UI and take effect after a browser refresh
You can use any aggregation function in your question.	You can use a count aggregation function in your query when asking about simple master dimensions.	Aggregation functions in your query will be ignored because a master measure uses the aggregation type set when it was defined.

## Published Apps

Insight Advisor behaves differently in published apps than in apps you are editing. This is because when editing an app, you typically have access to all fields in the app. In a published app, you only have access to master items.

One specific difference (described below as a limitation of aggregations) is that Insight Advisor can perform a count on a simple master dimension when the app is being edited. This is not possible when the app is published as the user does not have access to the underlying field.

## Recognizing Plurals

When you enter a metadata term (measure, dimension, or field name) as part of your query, Insight Advisor will recognize some variations of those terms, including plurals (e.g. Products instead of Product). It will not always recognize plurals of field, dimension, or measure values, however.

## Analysis Types & Charts

When asking a natural language question in Insight Advisor, you can describe the analysis you want to perform. The choice of analysis is determined by both the phrasing of your question and the combination of dimensions and measures you include. For example, if you say “Show revenue by product category and company name”, you will get a breakdown rather than a fact since that is the appropriate analysis for two dimensions and one measure.

Analysis Type	Sample questions you can ask	Phrases we recognize	Example Result
<b>Trend</b>	Show trend of revenue over Sales Order Date Show sales over time	Trend Historical Over time	Line chart
<b>Comparison</b>	Show revenue vs Gross Margin for Product Category How do revenue and Gross Margin correlate for each Product Category	Correlate by vs	Scatterplot
<b>Breakdown</b>	Show revenue broken down by product category and company name How is revenue distributed by product category and company name Show a map of revenue by country	By Broken down by Distributed by Between Share comes from Compare between Show a map of	Treemap Map chart
<b>Rank</b>	Highest revenue products Show product category ordered by revenue	Top / bottom Highest / lowest Best / worst Top most / bottom most Most / least Biggest / smallest	Bar chart
<b>Fact</b>	Show revenue How many customers do I have What are our sales		KPI
<b>List</b>	Show me a list of products Which customers are in London		List

## Limitations

Analysis types and charts have the following limitations:

- You cannot ask for a specific chart type (e.g. show me a pie chart). If you ask for a map and include a field containing geographic data, you receive a map because the field contains geographic data.
- If the number of distinct values exceeds the limits for a visualization, Insight Advisor returns a list.
- Asking for “Top 10” or “Bottom 10” produces a rank analysis of all dimension values in descending or ascending order accordingly (not just the top/bottom 10 values).
- You cannot specify multiple items to include in a filtered list (e.g. show me a list of customer and products in USA).

## Aggregations

Insight Advisor does not do mathematical operations in response to natural language queries. For example, it will not allow you to add two fields together. Insight Advisor will perform aggregations in some limited cases. For example, you can count the number of items in a simple dimension.

Aggregation Type	Sample questions you can ask	Phrases we recognize
<b>Count</b>	How many products we have? Count the number of employees	Count of Count Number of How many How many of Enumerate
<b>Sum</b>	What is total revenue for each product?  Note: this only works if revenue is a field. If revenue is a master measure, the word “total” will be ignored.	Sum of Total of Sum Total
<b>Average</b>	What is the average discount amount?  Note: this only works if “discount amount” is a field. If it is a master measure, the word “average” will be ignored.	Avg of Average of Avg Average
<b>Minimum</b>	What is the minimum employee count?	Min of Minimum of Minimal of Min Minimum Minimal
<b>Maximum</b>	What is the month with max revenue?	Max of Maximum of

Maximal of Max Maximum Maximal
---

## Limitations

Aggregations have the following limitations:

- You cannot ask for aggregations of a master measure. The calculation of the master measure already has an aggregation set.
- When you have access to fields, you can ask for an aggregation of a simple master dimension (for example, “count customer name”). If access to the app is controlled so that a user does not have access to fields (such as in a published app), you cannot aggregate these dimensions. This is consistent with behavior of self-service authoring (e.g. you cannot create a KPI based on a master dimension). You can, however, create a master measure such as “customer count”. This will be available for Insight Advisor users to query.

## Filters

You can use filters with your natural language queries. Insight Advisor supports the following types of filters:

- Category filters
- Measure filters
- Relative time filters

### Filter limitations

Insight Advisor queries a sample list of values when using filters. All filters have the following limitations:

- Fields that have an average value length greater than 50 characters are omitted from our search.
- Fields that have values that exceed 200 characters are omitted from our search.

### Category filters

You can add category filters to any question in Insight Advisor. You can refer to any dimension value in your question to either exclude or include specific items. You can include up to 3 values in your question.

Category filters	Sample questions you can ask	Phrases we recognize
<b>Include</b>	Show me customers that are in Finland and Mexico Show Customer Name where Employee City is Boston	On In For With Have
<b>Exclude</b>	Show Customer Name excluding Boston What is revenue for all products excluding shovels?	Excluding Not in Not for Are not Have no Without Not from Outside

## Limitations

Category filters have the following limitations:

- Insight Advisor does not recognize contractions, such as “isn’t”, “haven’t”, or “aren’t”. Use the full term instead, such as “is not”, “have not”, or “are not”.
- Exclusion filters do not work for dates. In this release, Insight Advisor is not able to answer “show me revenue excluding 2014”. You can, however, use dates as an include filter (e.g. “show me revenue for 2014”).

## Measure filters

You can add measure filters to your questions. This allows you to take advantage of the Qlik Associative Engine to identify both items with no associated measure values and measure values that meet certain conditions.

Measure Filters	Sample questions you can ask	Phrases we recognize
<b>Greater than</b>	Show Customer Name where Sales Gross Profit is greater than 100000	Is greater than Greater than Is larger than Larger than Is higher than

		Greater than Larger than Higher than >
<b>Less than</b>	What is the trend of accidents in cities with population less than 20000	Is less than Less than Is lower than Less than Lower than <
<b>Equal</b>	Which cars have number_of_cylinders equal to 6	Is Is equal to Equals to =
<b>Between</b>	How much revenue comes from customers with age between 25 and 35	Between Is Between
<b>No</b>	Show products that have no sales in Germany	Have no Do not have

## Limitations

Measure filters have the following limitations:

- Compound filters such as “Less than or equal to” ( $\leq$ ) and “greater than or equal to” ( $\geq$ ) are not supported. Use of the Between operator is recommended. For example, use “show me products with sales between 100000 and 200000” instead of “show me products with sales greater than 100000 and less than 200000”.
- You cannot ask “show me sales  $> 100$ ”. Instead, ask “show me sales where sales  $> 100$ ”.

## Relative time filters

Certain time related terms are supported when forming a question. These terms can be used as filters (e.g. before, during, or after). They also can be used to describe an analysis (e.g. Year to date, Month over Month, etc.).

Relative time filters	Sample questions you can ask	Phrases we recognize
<b>Compare After</b>	How many customers have first order date after 2014	Since After Later than
<b>Compare During</b>	What were sales during 2015	During In For

		On
<b>Compare Before</b>	How many stores did we have before 2017	Before Earlier than
<b>Year</b>	What are sales for this year?	This year Current year Previous year Last Year Next Year
<b>Month</b>	How many orders did we have last month	This month Current month Previous month Last month Next month
<b>Quarter</b>	How many sales reps had no sales last quarter	This quarter Current quarter Previous quarter Last quarter Next quarter

## Limitations

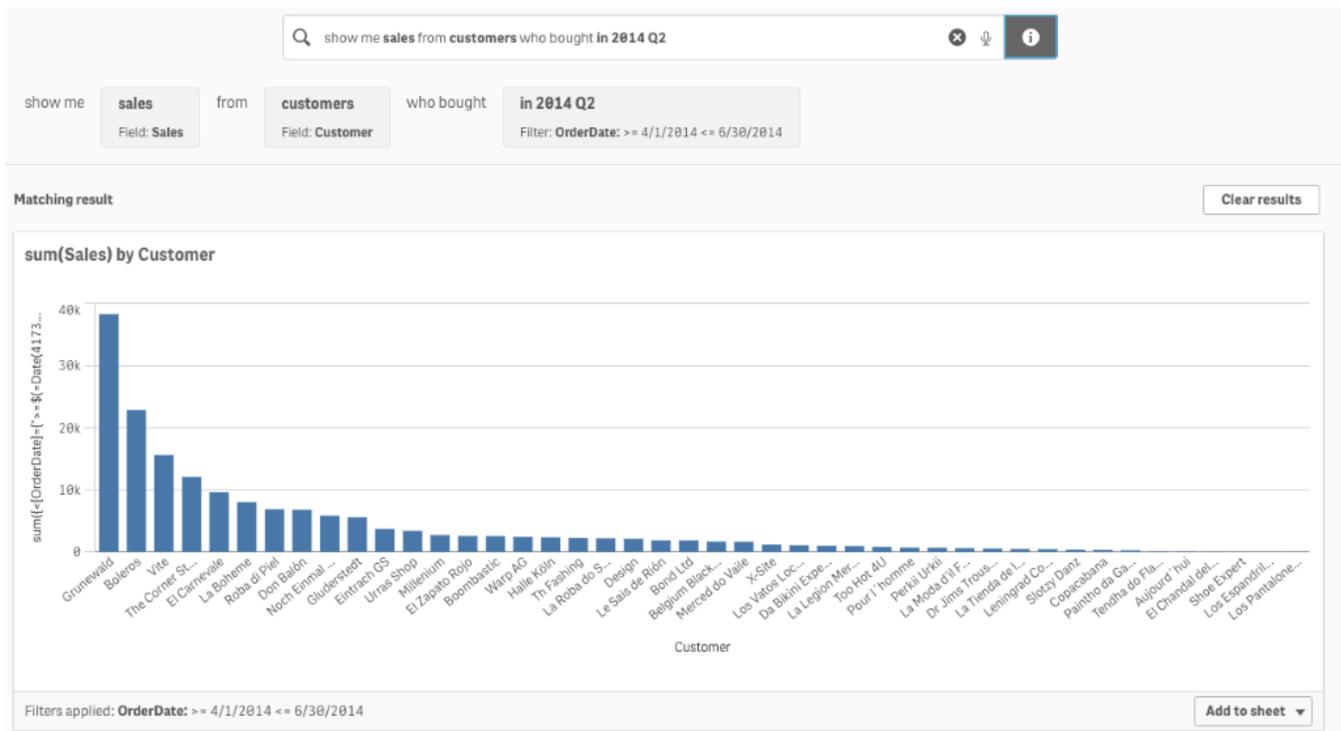
Relative time filters have the following limitations:

- All relative date filters are calculated with respect to the current date.
- Week is not supported.
- Relative time filters only work for the Gregorian calendar. Fiscal calendars are not supported. If you want to ask a question about a fiscal period, you can use a category filter. For example, “show me sales where fiscal\_order\_quarter is Q1 2014”.

## Combining Insight Advisor features

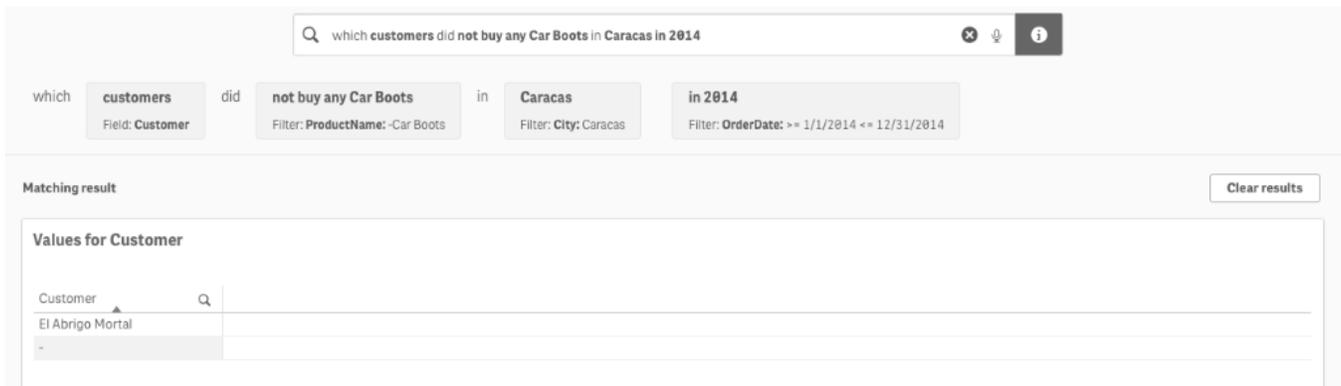
Here are some examples of questions you can ask by combining the features above.

**Show me sales from customers who bought in 2014 Q2**



You can apply a time filter for a year and a quarter to ask a question about sales by customer. Notice that a rank analysis is provided.

### Which customers did not buy any Car Boots in Caracas in 2014



You can combine an exclude category filter with both an include category filter and a date filter to list “which customers did not buy any Car Boots in Caracas in 2014”.

### What is the count of Customer that did not buy Bike Helmet

what is count of Customer that did not buy Bike Helmet

Matching result Clear results

countDistinct(Customer)

count(distinct {<[ProductName]-='{Bike Helmet'}>} [Customer])

90

Filters applied: ProductName: -Bike Helmet Add to sheet

You can combine aggregation with an exclusion filter to ask “what is the count of Customer that did not buy Bike Helmet”.

### How much Sales Revenue comes from Company Name with Customer Age between 35 and 55

how much Sales Revenue comes from Company Name with Customer Age between 35 and 55

how much **Sales Revenue** comes from **Company Name** with **Customer Age between 35 and 55**

Master measure: Sales Revenue Field: Company Name Filter: Customer Age: >= 35 <= 55

Matching result Clear results

Sales Revenue by Customer Age and Company Name

Customer Age	Company Name	Sales Revenue
<b>Totals</b>		<b>739077457.72</b>
35	A-ARVIN Laser Resources	1366.26
35	a2i	121872.07
35	Aadast	118606.97
35	Abbey Department of Finance	58086.33
35	AboveNet	12138.56
35	Abplus	3447.90
35	Abstract	120917.76
35	Ac Fermentum Vel Corp.	4690.10
35	Acacia	88187.40
35	Acc Tonec	35211.98
35	Accel Partners	42716.28
35	AccessWare	57409.75

Filters applied: Customer Age: >= 35 <= 55 Add to sheet

You can ask for a measure and a dimension, filtered by another measure.



## About Qlik

Qlik is on a mission to create a data-literate world, where everyone can use data to solve their most challenging problems. Only Qlik's end-to-end data management and analytics platform brings together all of an organization's data from any source, enabling people at any skill level to use their curiosity to uncover new insights. Companies use Qlik products to see more deeply into customer behavior, reinvent business processes, discover new revenue streams, and balance risk and reward. Qlik does business in more than 100 countries and serves over 48,000 customers around the world.

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