

WHITEPAPER

# 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”. (Note: You can use features like Vocabulary to author your app such that Chat can map concepts like “we won” to the underlying data.)
- correct your spelling
- perform a fuzzy match on field values. For example, “give me customer name that start with ‘SA’” will not work.
- Respond to questions for specific charts or sorting criteria (e.g., show me a pie chart, or show me sales by Customer and sort them in descending order)

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

In Insight Advisor, as users type a 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.

Note that auto-complete is not available when using “Ask Insight Advisor” in the hub, or via Channels.

## Measures & Dimension Names

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 use the Vocabulary feature when authoring an application so that commonly used concepts are recognized by Insight Advisor and translated to the underlying data model terminology.

## Master Items vs Fields

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

Fields	Master Dimensions	Master Measures
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 or Managed Space Apps

Insight Advisor behaves differently in published / Managed Space 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 or in a managed space as the user does not have access to the underlying field.

## 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 ask “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 sales trend for this year Show cost over time	Trend Historical Over time	Line chart
<b>Comparison</b>	Show sales vs cost for Product Group How do sales and cost correlate for each Product Group	Correlate by vs	Scatterplot
<b>Breakdown</b>	Show sales broken down by product group and customer How are sales distributed by product group and customer? Show sales by city	By Broken down by Distributed by Between Share comes from Compare between	Treemap Map chart
<b>Rank</b>	Show the top selling Product group Show the Product group having lowest sales for Berlin Show the best 5 product groups by sales Show the bottom 10 managers by sales	Top / bottom Highest / lowest Best / worst Top most / bottom most Most / least Biggest / smallest	Bar chart
<b>Fact</b>	Show sales* How many countries do I have** What is our margin		KPI (KPI charts are not shown in Insight Advisor Chat or Channels)
<b>List</b>	Show me a list of products Which customers are in Berlin		List

\* If you ask the questions above using “Ask Insight Advisor” in the hub, your results may be affected by your conversational context. You can clear context by removing the “Currently analyzing app”. Consult the “Ask Insight Advisor” white paper for more details on conversation context.

\*\* Note that in some cases NL cannot recognize the plural of a field name – such as “how many countries”. You may have to ask “how many country do I have”. This can be corrected using the Vocabulary feature.

## 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.
- 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 do we have?  Show count of managers	Count of Count Number of How many How many of Enumerate
<b>Sum</b>	What is total cost for each product?  Note: this only works if cost is a field. If cost is a master measure, the word "total" will be ignored.	Sum of Total of Sum Total
<b>Average</b>	What is the average cost for this year?  Note: this only works if "cost" 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 cost?	Min of Minimum of Minimal of Min Minimum Minimal
<b>Maximum</b>	What is the region with maximum cost?	Max of Maximum of

## Limitations

Aggregations have the following limitations:

- You cannot ask for aggregations of a master measure. Master measures already have a defined aggregation.
- 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.

You can also use Business Logic to exclude various fields and master items from Insight Advisor Natural Language look ups.

## 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 Berlin and London  Show Customer where City is Boston	On In For With Have
<b>Exclude</b>	Show Customer excluding Boston  What is Sales for all Products excluding frozen food?	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 sales excluding 2014”. You can, however, use dates as an include filter (e.g. “show me sales 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 me Customer where Margin 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 are the Sales by Customer where cost is less than 100K in USA	Is less than Less than Is lower than Less than Lower than <
<b>Equal</b>	Show me Product Group where Sales rep number is 111	Is Is equal to Equals to =
<b>Between</b>	Show me Cities where Sales is between 1M and 1.5M	Between Is Between
<b>No</b>	Show me Customers that have no Sales	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>	Show me Products having Invoice Date after 2019	Since After Later than
<b>Compare For</b>	What were sales for 2018	In For

		On
<b>Compare Before</b>	How many orders 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>	Top managers by sales for last quarter Top managers by sales for Q1 2020	This quarter Current quarter Previous quarter Last quarter Next quarter

## Limitations

Relative time filters have the following limitations:

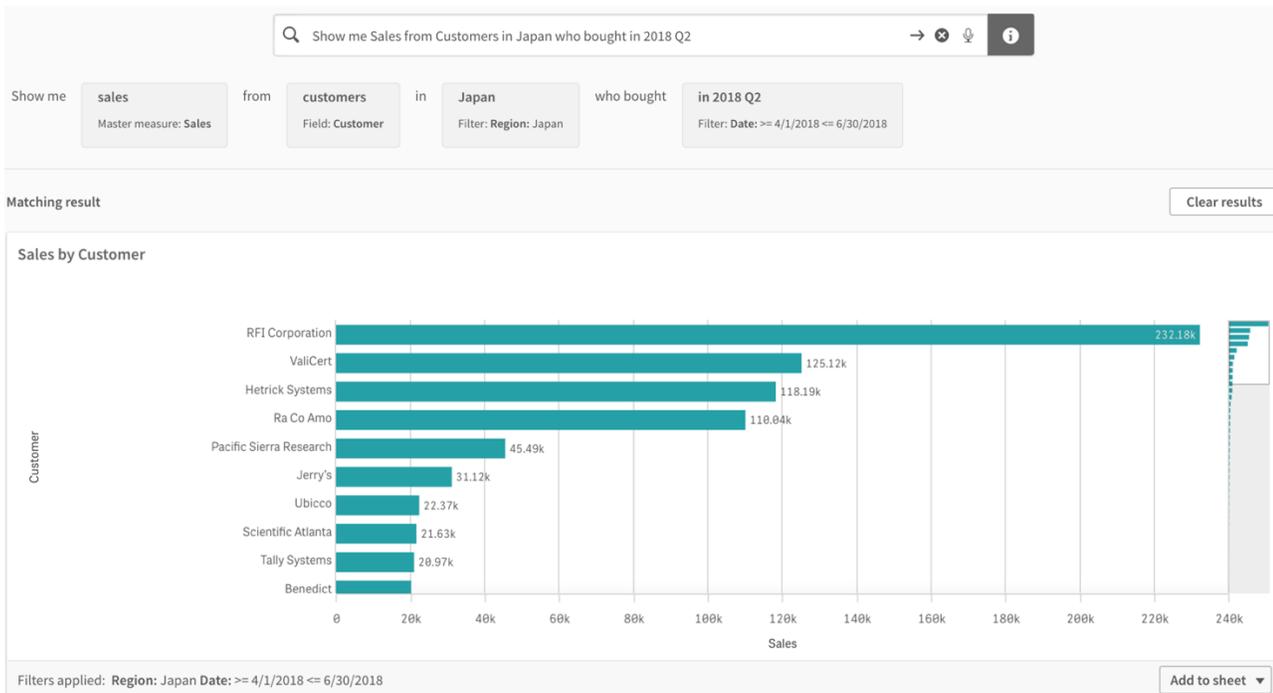
- All relative date filters are calculated with respect to the current date.
- Week is not supported.
- Relative time filters only work for the Gregorian calendar. Fiscal calendars are not supported. If you want to ask a question about a fiscal period, you can use a category filter. For example, “show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

## Measure by Dimension filtered on year, quarter and a dimension category

You can apply a time filter for a year and a quarter to ask a question about sales by customer in some region. “Show me sales from customers in Japan who bought in 2018 Q2”. Notice that a rank analysis is provided.



## Exclude category filter with an include category filter

You can combine an exclude category filter with both an include category filter like – “Which Customer in Boston did not buy any baked goods”

Q Which Customer in Boston did not buy any baked goods ?

which **customer** in **Boston** did **not buy any baked goods**

Field: Customer Filter: City: Boston Filter: Product Group: -Baked Goods

**Matching result**

**Values for Customer**

Customer	Q
ACCPAC International	
Brentano's	
FenP Innovators	
Greymac Trust Company	
Lucky	
Pallister Management	
Take 3	
-	

## Aggregation combined with measure filter

You can combine aggregation with measure filter, such as “Count of manager achieving margin more than 100K in USA”

The screenshot shows a query builder interface. At the top, a search bar contains the text "Count of manager achieving margin more than 100K in USA". Below the search bar, three filter boxes are visible: "Count of manager" (Field: Manager), "margin more than 100K" (Filter: Margin: > 100000), and "USA" (Filter: Region: USA). The interface is labeled "Matching result" and displays the SQL query "countDistinct(Manager)" and the result "3".

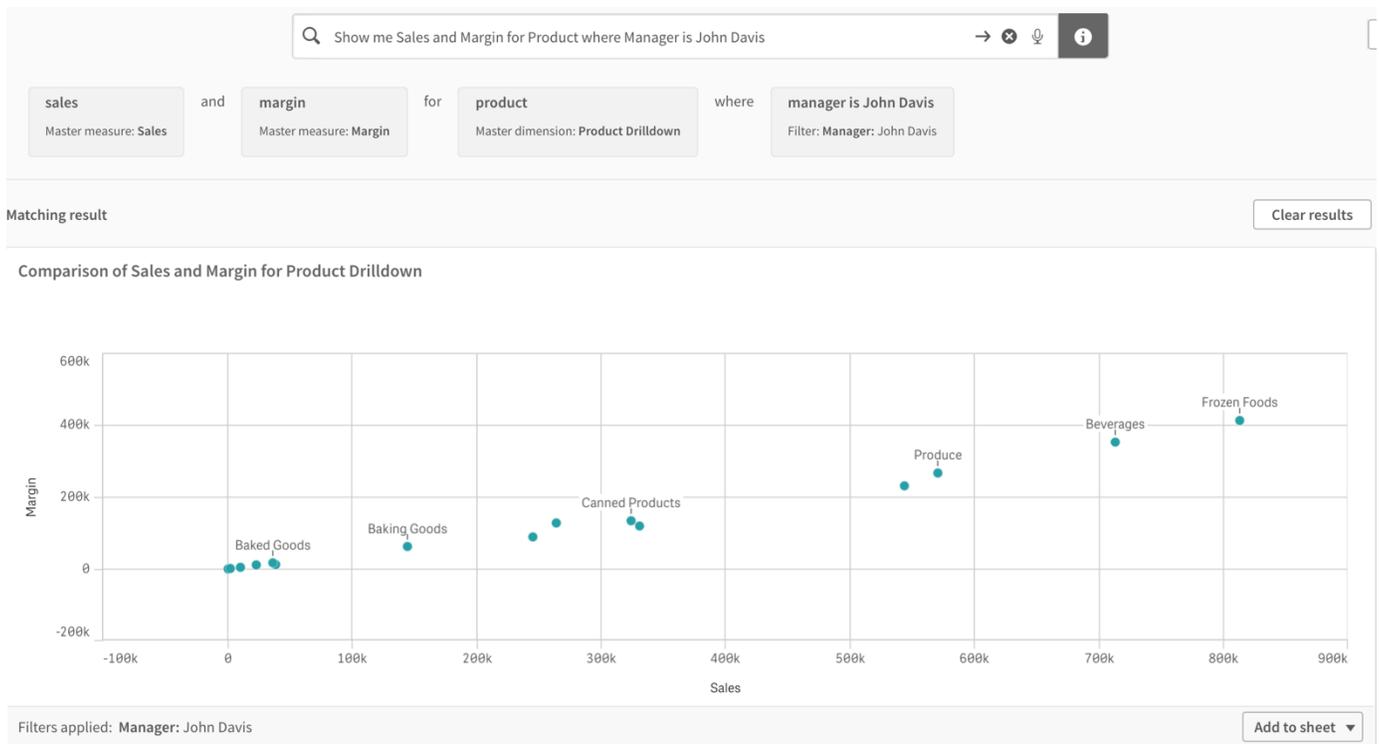
```
countDistinct(Manager)
```

countDistinct(Manager)

3

## Two measures by a dimension, filtered on another dimension.

You can ask for 2 measures for a dimension, filtered by another dimension value





## About Qlik

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