Business Warehouse
BEX Query Guidelines

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Specific Query Design Guidelines

♦ Suppress zeroes should be selected/set to **Active** in the query properties.

♦ Limit the use of structures except in cases where the same large grouping of key figures or characteristics is used across many reports. This helps to minimize development and rework when making changes.

♦ Follow naming standards for all objects created (i.e. queries, variables, structures, restricted key figures, calculated key figures, etc.).

Variables/Parameters/Prompts

♦ To maintain uniformity for users, use existing variables across all InfoCubes . Name changes made to variables will erode uniformity.

♦ Group mandatory/required variables at the top of the variable screen.

♦ Group similar variables together.

♦ A time characteristic should be included in every report, if available, and should generally be a mandatory/required variable. Examples include: Academic Year, Academic Session, Fiscal Year, Validity Date.

Key Figures

♦ Negative numbers should be displayed within parentheses – i.e. (12) is a negative twelve.

♦ Number Format for Zero Value Display should be to "Display Zeros".

♦ All key figures should either be created on the InfoCube as stored (base) key figures or on the cube as calculated or restricted key figures. Do not create key figures (formulas or selections) in individual reports (in other words, these key figures do not show up on the left hand side of the query designer because they are not specific to an InfoCube, they are specific to a report) (formulas and selections are evaluated during query execution; calculated & restricted key figures are precalculated).

♦ Use standard naming convention with restricted key figures.

♦ Calculated key figures should be limited to simple calculations based on stored key figures. Complex calculations should be created as a stored key figure on the InfoCube.

♦ If you need a stored key figure created, contact BI-Requests@email.uky.edu

Characteristics

♦ A time period characteristic should be included in every report if available. Examples include: Academic Year, Academic Session, Fiscal Year/Period.

♦ Minimize the use of characteristics in rows and columns for the initial query view. Include them as free characteristics that can be included when required. This will bring back less data because it is summarized, and can be aggregated in the future for additional performance gains.

♦ Properties of each characteristic used in a query should be as follows:

   o **Display as** "Key and text" – where available.

   o **Display of Results** / Suppress Results Rows "With Only One Value"

General Query Design Considerations for Improved Performance

♦ If you have a choice of building a query from an InfoCube or MultiProvider always choose the InfoCube. Building a query from a MultiProvider will require additional table joins in order to satisfy the query.

♦ Minimize the amount of information returned by the query. The less information returned from the query, generally the faster it can be transferred to the end user.

♦ Design queries to prevent a large number of rows from being returned (greater than 500). This may be accomplished by using mandatory (required) variables to filter data or create exception reports to return only the data of interest.

♦ Limit the number of free characteristics available in the report in order to ensure large amounts of data cannot be requested. This also assists in avoiding database joins involving a large number of tables. Each characteristic displayed in the result set generally adds one table join to the generated SQL for the query.

♦ Avoid complex queries that offer everything for every user. Create multiple queries to meet the requirements and/or use the report/report interface to link reports together at different levels of detail. If a report/report interface is required contact: BI-Requests@email.uky.edu.

♦ If a tabular type (flat) report is required, build it using an ODS, if available. The database joins and indexing are much simpler in these cases and can be more easily optimized.

♦ Avoid using remote InfoCubes except in the case where there is a small amount of data and a limited number of users.

♦ Limit the number of key figures returned from the database for queries.

♦ Minimize the number of restricted key figures (RKF) used in the query. RKF's result in additional database processing and complexity in retrieving the query results.

♦ Instead of putting a restriction on a RKF, try to use a variable. This will cut down on the query processing time, especially if the user utilizes the personalization feature.

♦ Using calculated key figures that require numerous key figures to calculate the result will degrade the performance of the queries. If the calculated key figure is used often and requires more than 2-3 key figures to calculate consider storing it directly in the InfoProvider. If a reusable calculated key figure is needed contact: BI-Requests@email.uky.edu.

♦ Only display necessary key figures in your query output. For example, if a formula is displayed in the query, it is usually not necessary to also display all the individual key figures that comprise the formula. Suppressing the display of key figures may improve network load as less information is passed to the user. The key figures are still retrieved from the database and may impact overall query performance.

- Use Web reporting rather than Business Explorer (BEx) Analyzer to run a query. Web reporting reduces the network overhead when compared to BEx. In addition, Web reports generally offer better performance than BEx Analyzer queries.

- Use characteristics or navigational attributes rather than hierarchies, especially when the hierarchies are large with many nodes. If hierarchies are to be used, limit the number of nodes in the query results by using filters and variables for the hierarchy. The objective should be to make the entry hierarchy level as deep as possible upon executing the report. This limits the levels of the hierarchy that must be processed at execution time.

- Use filters as much as possible, especially for large characteristics, to reduce the size of the query result.

- Minimize conditions and exceptions as much as possible. If they are not always required, define them as inactive and allow the report user to enable them when required.

- Minimize the number of reusable structures in the query. Due to their complexity, they can impact performance as they are evaluated at query time similar to RKF's.

- Only use navigational attributes on the report if they are required. It is better to use a characteristic if available. Even though navigational attributes appear the same to end users, the way they are accessed via the database incurs a performance penalty for using them due to the joins it generates.

- If too many complex calculations are being done in queries, it will add considerably to front-end time. The general rule of thumb is that you don't want to use more than 10 calculations in a query, rather move them into the InfoProvider. If a reusable complex calculation is needed, contact BI-Requests@email.uky.edu

Frequently Asked Questions

Why set Suppress Zeroes to Active?

Setting Suppress Zeroes to **Active** in the query properties eliminates the output of an item that does not have any activity (quantity/amount equals zero); therefore, making the report more condensed and readable.

If I have a complex calculation, how do I get it on the InfoCube?

InfoCubes are managed by a Business Warehouse Manager. You will need to send a request for change to BI-Requests@email.uky.edu. Identify the InfoCube along with the calculation needed, and a suggested name for the calculated key figure. Make the name as descriptive as possible within 9 characters.

What can I do if I have a query that runs a long time or if the query continues to run without stopping (hung-up/infinite loop/…)?

Send email to BI-Requests@email.uky.edu. Identify the InfoArea, InfoProvider, and the query. Depending on the problem, you may want to consider adding more filters or narrowing the range of data selected for your query.

What can I do if the fields(s) I need is not in an InfoProvider?

Send email to BI-Requests@email.uky.edu. Identify the InfoProvider and the field(s) needed.

Can I use other tools (Crystal/Brio/WebFOCUS?...) along with or instead of BEx to get to SAP data?

At this time, there are no other tools connected to the SAP data.

What will happen if I close the BEx window while a query is running?

Processing stops.

Where are the naming standards?

The naming standards are in a separate document. Go to http://www.uky.edu/IRIS/BW/bw-documentation.htm.

Since navigational attributes incur performance penalties, when is it acceptable to use them and what should I do if I need one?

You will need a navigational attribute when you identify an attribute assigned to a characteristic that you need to filter on or drill-down on instead of just displaying.

To obtain a navigational attribute, send email to BI-Requests@email.uky.edu. Identify the InfoProvider, characteristic and attribute(s) in question.

Glossary

***Aggregates*:** Aggregates are subsets of data from an InfoCube. Aggregates make it possible to access InfoCube data quickly in Reporting. Aggregates serve, like data base indexes, to improve performance.

***Attributes (Master Data Attributes)*:** Are not stored in an InfoCube. They are joined to the master data.

> **Display Attributes:** Subordinated to a characteristic and cannot be filtered or drilled on in a query.

> **Navigational Attributes:** InfoObjects that are logically assigned attributes which you can filter or drill on in the query.

***Characteristics*:** Type of InfoObject. A non-numeric field; like building, account number, course, birth date …

> **Free Characteristic:** Characteristics not displayed on the initial report, but available to be included in the report. Free Characteristics have drill-down or drill-across capabilities.

***Conditions*:** By defining a condition, you have the option of analyzing the query results in more detail. You can analyze combinations of characteristics using ranked lists, thereby displaying your ten best/worst items.

***Exceptions*:** The functions in exception reporting enable you to select and highlight unusual deviations of key figure values in a query.

***Filter*:** A filter has a limiting effect on the data selected. When defining the filter, you select characteristic values from one or more characteristics or from a key figure. All of the InfoProvider data is aggregated using the filter selection of the query.

***Hierarchies*:** The organization of the values of a characteristic into a tree structure.

> **Example:** A hierarchy for a program of study would be the college.

> In reporting, hierarchies for characteristics can be set in the following ways:
> o   As presentation hierarchies for a characteristic, if it is to be displayed as a hierarchy.
> o   As a way of selecting particular values if a characteristic is to be restricted to a hierarchy or a hierarchy node.

> Hierarchies are created in the R/3 system for hierarchy basic characteristics and then loaded into the BW system. They can be used across InfoProviders.

InfoArea: A grouping of InfoProviders (ODSs, InfoCubes, etc.) or a grouping of InfoObjects (InfoObject Catalog).

InfoCubes: An InfoCube is an InfoProvider that describes a self-contained dataset. An InfoCube is a quantity of relational tables that are created according to the star schema: a large fact table in the center, with several dimension tables surrounding it.

> **Remote InfoCube:** InfoCube whose transaction data is not managed in the Business Information Warehouse, but rather externally.

InfoObject: Business evaluation objects (for example, customers or sales) are called InfoObjects in BW.

> InfoObjects are subdivided into characteristics, key figures, units, time characteristics, and technical characteristics (such as request numbers).

InfoProvider: Analysis-relevant view of a BW object for which queries in SAP BW can be created or executed.

> There are two types of InfoProviders. One type includes objects that contain physical data. These are known as data targets, such as InfoCubes, ODS objects, and InfoObjects (characteristics with attributes, texts, or hierarchies). The other type includes objects that display no physical data storage, such as InfoSets, RemoteCubes, SAP RemoteCubes, and MultiProviders.

InfoSet: A semantic view of ODS objects and InfoObjects (characteristics with master data) that allows you to create reports on these objects, particularly on the joins between these objects.

Key Figures: Type of InfoObject. Numeric fields; like number of items on hand, account credit amount & account debit amount.

> **Calculated Key Figures:** Calculated key figures consist of formula definitions containing basic key figures, restricted key figures or precalculated key figures.

> **Restricted Key Figures:** You can restrict the key figures of an InfoProvider by selecting one or more characteristics. The key figures that are restricted by one or more characteristic selections by selecting a basic key figure, calculated key figure or by other restricted key figures.

Master Data: Static data (data that rarely changes) describing characteristics.

> **Example:** An employee's master data can be Birth date, Home Address, Home Phone, Social Security Number, and Ethnicity.

MultiProvider: Type of InfoProvider that combines data from several InfoProviders and makes it available for reporting.

The MultiProvider itself contains no data; its data comes exclusively from the InfoProviders on which it is based (collated using a join-union operation). A MultiProvider is assembled from different combinations of InfoProviders.

ODS: Operational Data Store is an object that stores consolidated and cleansed transaction data on a detail level.

Personalization: You can personalize single variables or all variables in a Web application. This means you assign the value(s) to a variable permanently or until you remove the personalization. Personalization means you do not have to enter the value(s) for a variable over and over again.

Report to Report Interface: The report-report interface allows you the flexibility to call a *jump target (receiver) online from a BW query (sender) within or outside of the* Business Information Warehouse. Jump targets that have been assigned to a BW query can be selected in BEx Web applications and in the BEx Analyzer. You access them from the context menu under the Goto function.

Structure: Groupings of characteristics and key figures in an InfoProvider.

Local Structures: Structures that have not been saved as reusable and can only be used in one query.

Reusable Structures: A structure that has been saved as reusable can be used in several queries for the same InfoProvider.