

# Creating Line Item Dimension and High Cardinality Dimension



## Applies to:

SAP BI 7.0

## Summary

The project entails with the Query run time improvement on some of the cubes. We found that some of the cubes in our system were taking a lot of time for query execution. This document will clarify how we decided which all dimensions need to be changed to Line Items and which to High Cardinality and how we implemented it in already live environment.

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## Author Bio



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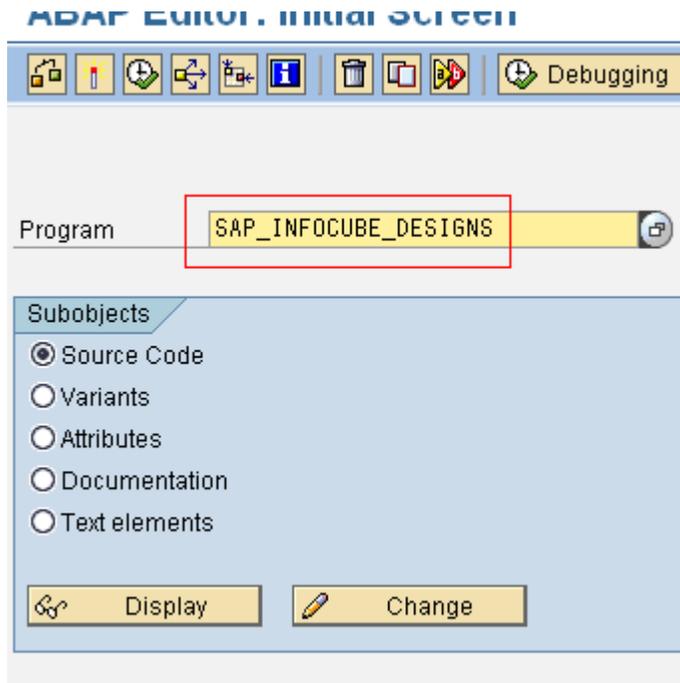
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## 1. How to decide which dimension needs to be made Line Item Dimension (LID)/High Cardinality?

There are different scenarios on the basis of which we can decide which dimension should be LID and which should be high Cardinality.

To find the list of cubes and dimensions which could be the candidates for LID we used SAP standard code "SAP\_INFOCUBE\_DESIGNS". On executing this code we got the list of all the cubes and their corresponding dimensions with the ratio of memory occupied by dimensions to the memory occupied by Fact Table.



After executing this code we will get output as follows:-

## Print a list of the cubes in the system and their layout

Print a list of the cubes in the system and their layout

0COPC_C10	/BI0/D0COPC_C101	rows: 2.091.633	ratio: 98 %
0COPC_C10	/BI0/D0COPC_C102	rows: 53.857	ratio: 3 %
0COPC_C10	/BI0/D0COPC_C103	rows: 54.900	ratio: 3 %
0COPC_C10	/BI0/D0COPC_C104	rows: 1.917	ratio: 0 %
0COPC_C10	/BI0/D0COPC_C105	rows: 2	ratio: 0 %
0COPC_C10	/BI0/D0COPC_C106	rows: 70	ratio: 0 %
0COPC_C10	/BI0/D0COPC_C107	rows: 2.081	ratio: 0 %
0COPC_C10	/BI0/D0COPC_C10P	rows: 2	ratio: 0 %
0COPC_C10	/BI0/D0COPC_C10T	rows: 2	ratio: 0 %
0COPC_C10	/BI0/D0COPC_C10U	rows: 123	ratio: 0 %
0COPC_C10	/BI0/E0COPC_C10	rows: 0	ratio: 0 %
0COPC_C10	/BI0/F0COPC_C10	rows: 2.132.367	ratio: 100 %
0TCT_C01	/BI0/D0TCT_C013	rows: 7.238	ratio: 12 %
0TCT_C01	/BI0/D0TCT_C018	rows: 6	ratio: 0 %
0TCT_C01	/BI0/D0TCT_C019	rows: 11.563	ratio: 19 %
0TCT_C01	/BI0/D0TCT_C01P	rows: 6	ratio: 0 %
0TCT_C01	/BI0/D0TCT_C01T	rows: 12	ratio: 0 %
0TCT_C01	/BI0/E0TCT_C01	rows: 0	ratio: 0 %
0TCT_C01	/BI0/F0TCT_C01	rows: 60.153	ratio: 100 %

In the above screen the first column shows the cube name, the second column shows the dimensions (Tables starting with /BI0/D\*), E Fact Table (/BI0/E\*) and F Fact table (/BI0/F\*) and the last column shows the ratio of table to the Fact Table.

We took the download of this output to Excel sheet and filtered the whole result on the condition where Dimension table to Fact Table ratio is more than 20 % (as per the recommendation of SAP).

We found following 3 different cases in our project which is discussed in detail as follows.

### Case I

For Cube ZSDCACC02 we had one dimension /BIC/DZSDCACC025 which has 2703233 entries and size corresponds to 100% of the Info Cube. Hence we decided to convert this to Line Item Dimension or High Cardinality dimension. However this dimension had multiple characteristics

Other	ZSDCACC025
Incoterms part 1	0INCOTERMS
Incoterms part 2	0INCOTERMS2
Route	0ROUTE
Reason for late delivery	ZSDILATED
New delivery date	ZSDINEWDE
Delivery lot, w/reason	ZLOT02WR
Sales order + item, w/reason	ZORDI2WR
Reference doc., w/reason	ZREFDOCWR
Quintiq status	ZSDIQUSTA

And the cube already had 16 dimensions (including the 3 compulsory dimensions) hence we had to mark it as High Cardinality Dimension rather than making it a LID.

### Case II

In the info cube ZSDCBIL09 we had one dimension /BIC/DZSDCBIL09B contains almost 57% of info cube data (around 1906470) which is much more than 20% hence we selected it for LID as this dimension had only 2 characteristics



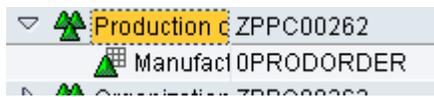
And the total number of dimensions in the cube was less than 16 so we decided to split this dimension in two different LIDs as both of the characteristics contained a significant number of data as shown below :-

Table /BI0/SREF\_DOC\_NO contains 6491188 records.

Table /BI0/SREFER\_DOC contains 3087838 records.

### Case III

In the info cube ZPPC0026 we had a dimension /BIC/DZPPC00262 which contains around 66% of the info cube data(404725) which is much more than 20% hence we opted for LID in this case as it has only one characteristic as follows :-



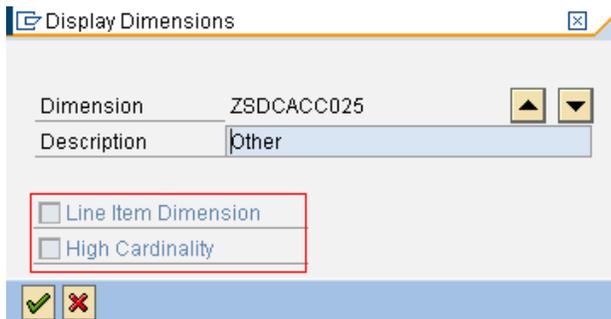
## 2. Creation of LID/High Cardinality Dimension

As per the cases given above we have different procedures to make a dimension as LID or High Cardinality Dimension. Also we need to keep few points in mind before doing this activity successfully. We will discuss the above cases separately as follows:-

### Case I

We can make a dimension High Cardinality dimension directly in the live environment that is in the production system with cube already having data in it. The point which should be kept in mind while doing this is that there should not be any data load during this time period. However it's always a good practice to do the changes in the development system and transport it to the production environment after doing the complete testing in the QA. Steps for doing this activity are as follows:-

Step 1:- Change the dimension /BIC/DZSDCACC025 to High Cardinality dimension as follows in the development system.

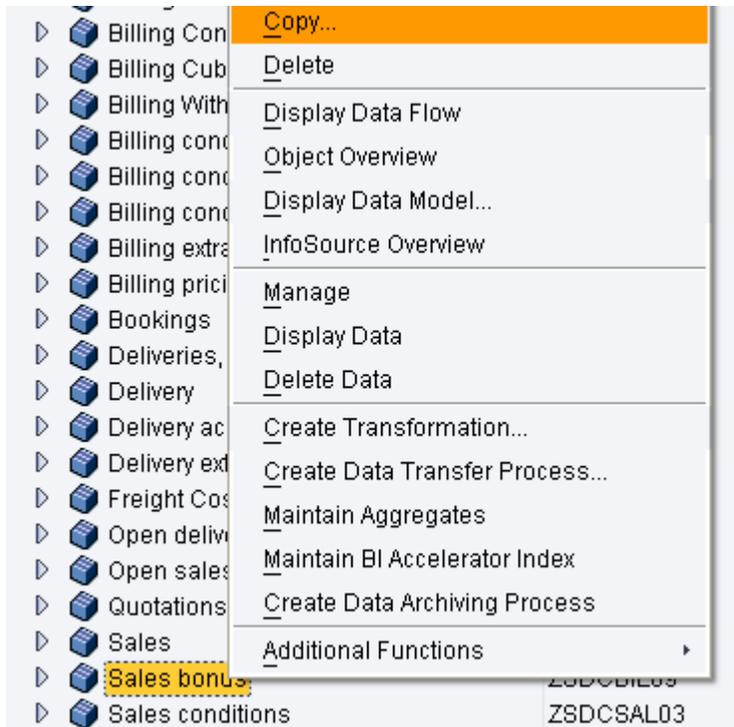


Step 2:- Save and activate the cube and its underlying transformations and transport it to the production.

## Case II and Case III

We can't create a line item dimension with data in the cube ZSDCBIL09. Hence the only way to create a line item dimension in these cases is as follows (as we need to split the existing dimension in 2 dimensions and make both of them as Line Item Dimension in case II ). However we need not to split the dimension in the Case III so we can skip the step of splitting dimensions for Case III.

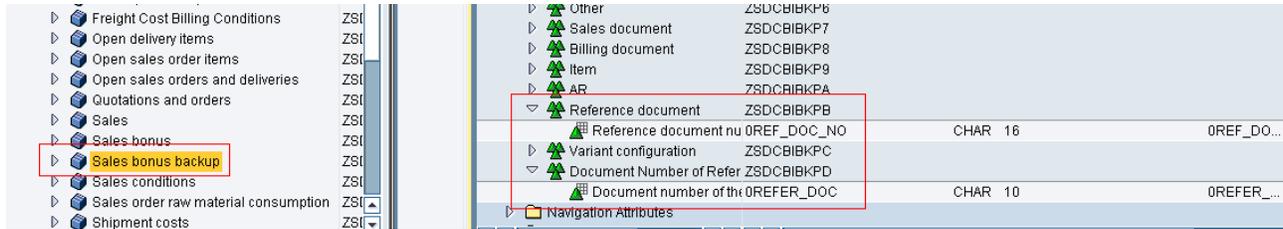
Step 1:- Create a copy cube similar to the existing cube by selecting Copy option from the context menu of the original cube and provide a name for that.



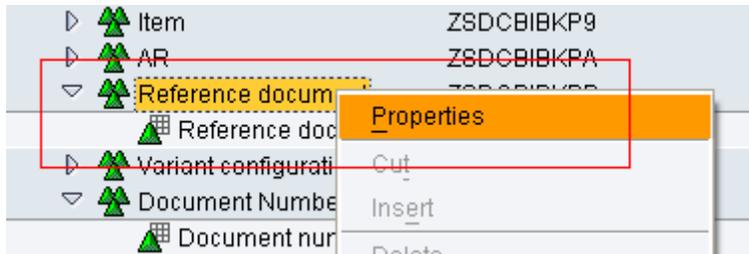
Edit InfoCube		
InfoCube	C_ZSDCBI	Sales bonus
InfoArea	SD	Sales and distribution
Copy From	ZSDCBIL09	
<b>InfoProvider Type</b> <input checked="" type="radio"/> Standard InfoCube <input type="checkbox"/> Real Time With Physical Data Store <input type="radio"/> VirtualProvider <input type="checkbox"/> Do Not Transform Select.Cond. Without Physical Data Store		<b>System Type (Namespace)</b> <input type="radio"/> SAP (Delivered by SA <input checked="" type="radio"/> CUS (Generated by L <input type="radio"/> PAR (Partner) Namespace

Step 2:- Create a new dimension similar to ZSDCBIL09B in the backup cube by choosing the Create Dimension option from the Context menu of Dimensions in the cube.

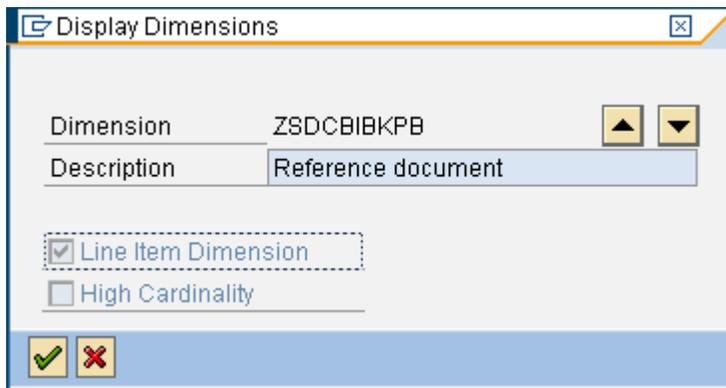
Step 3:- Move characteristic REFER\_DOC to the new dimension.



Step 4:- Mark the new dimension as well as the old dimension as the Line Item Dimension by choosing the Properties option of the Context menu of the dimension as follows :-



And then check the LID check box as follows:-



Step 5:- Create a transformation and DTP from old cube to new cube.

Step 6:- Save and activate the cube and its underlying transformations.

Step 7:- Transport the new cube and transformations to the production system.

Step 8:- Transfer all data from old cube to new cube in production system.

Step 9:- Validate the data content between old and new cube.

Step 10:- Delete data from the old cube.

Step 11:- Repeat steps 2 to 4 in old empty cube to make the LID.

Step 12:- Save and activate the cube and its underlying transformations in production system.

Step 13:- Create a transformation and DTP from new cube to old cube.

Step 14:- Transfer the data back to the old cube.

Step 15:- Delete the new cube

Step 16:- If there is delta loads then reinitialize the delta. In our case it was full load hence we did not need to follow this step.

### 3. Advantages of creating LIDs/High Cardinality Dimension

- For Line Item Dimension/High Cardinality dimension no DIM ids are created due to which the join of tables decreases and thus query execution timing improves.
- Similarly as there is no time taken for creation of DIM table for these dimensions data load timings also improves.

## Related Content

[SAP Help for Line Item Dimension and High Cardinality](#)

[SAP Help for Info cube Performance](#)

[SAP SDN](#)

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