

Exception Aggregation in Business Explorer



Applies to:

SAP BI – Business Explorer i.e. BEx Designer. This Explorer connects to SAP Net Weaver Business Warehouse (Formerly BI). It will also work on SAP BI 3.5. For more information, visit the [Business Intelligence homepage](#).

Summary

Here in this paper we explore the concept of exception aggregation in business explorer in detail. We analyze various available options in exception aggregation tab and how they work.

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Introduction

Exception Aggregation: As the name signifies is used to aggregate (sum up) the result of a key figure in a different manner than standard OLAP functionality. It aggregates the key keyfigures depending upon some characteristic value. In other words Exception Aggregation counts the occurrences of a key figure value relative to one or more other characteristics.

The OLAP processor executes the aggregations in the following sequence:

1. *Normal aggregation:*

Standard aggregation is executed first. Possible types of aggregation are summation (SUM), minimum (MIN), and maximum (MAX). Minimum and maximum can be set, for example, for date key figures. This type of aggregation is catered at the standard key figure level.

2. *Exception aggregation with respect to the reference characteristic:*

The aggregation of a selected characteristic takes place after the standard aggregation (exception aggregation). Possible exception aggregations available are average, counter, first value, last value, minimum, maximum, no aggregation, standard deviation, summation and variance. Cases where exception aggregation would be applied include, for example, storage non-cumulatives that cannot be totaled by time, or counters that count the number of characteristics for a particular characteristic

3. *Currency and units aggregation*

Aggregation by currency and units is executed last. If two figures are aggregated unequally with different currencies or units, the system marks this with '*'. Formulas are only calculated after figures have been fully aggregated

The Exception aggregation is used in special scenarios where we do not want to show the result of key figure as simply the total of all the values. For example

Is we are looking at a report which shows the Number of employees by year for the past 10 years the total field for the Number of employees shows the total of all the figures for the past 10 years which is wrong but it should show the last value i.e the recent years figures because the number of employees is not something to add up. Here we use the exception aggregation to let the BEx know how to show/summarize the values, here in this case we can use "Last Value..." "Some more examples of exception aggregation are Average, First Value etc..."

Please Note: Exception Aggregation can only be applied to calculated key figures,

Exploring Exception Aggregation with Examples:

Here we elaborate the concept of Exception Aggregation by means of analyzing its available options one by one. We have made a Query on top of a DSO. The user requirement is that he need's to see the data for various materials sold in a particular year with corresponding billing document number . The data is present in the following format: Here we are unable achieve the desired result by means of a restricted key figure and calculated key figure hence we have to use exception aggregation.

Data Sheet

Material	Billing Document No	Year	Condition Type	Item Type	Amount	Currency
100001	12005411	2010	VAT	A	100	USD
100001	12005411	2010	VAT	B	200	USD
100001	12005411	2010	VAT	C	300	USD
100002	12005421	2010	VAT	X	200	USD
100002	12005421	2010	VAT	Y	200	USD
100003	12005431	2010	VAT	A	300	USD
100003	12005431	2010	VAT	M	400	USD
100003	12005431	2010	VAT	C	500	USD
100003	12005431	2010	VAT	D	600	USD
100004	12005441	2010	VAT	L	500	USD
100004	12005441	2010	VAT	B	500	USD
100004	12005441	2010	VAT	C	500	USD
100005	12005451	2010	VAT	K	200	USD
100005	12005451	2010	VAT	K	200	USD
100005	12005451	2010	VAT	B	400	USD
100005	12005451	2010	VAT	B	400	USD
100006	12005461	2010	VAT	A	1000	USD
100006	12005461	2010	VAT	A	1000	USD
100006	12005461	2010	VAT	B	1000	USD
100006	12005461	2010	VAT	B	1000	USD

Data Loaded in DSo:

Material	ZBILDOCNO	ZYEAR	ZKNART	Item Type	Amount	Currency
					0,00	
100001	12005411	2010	VAT	A	100,00	USD
100001	12005411	2010	VAT	B	200,00	USD
100001	12005411	2010	VAT	C	300,00	USD
100002	12005421	2010	VAT	X	200,00	USD
100002	12005421	2010	VAT	Y	200,00	USD
100003	12005431	2010	VAT	A	300,00	USD
100003	12005431	2010	VAT	M	400,00	USD
100003	12005431	2010	VAT	C	500,00	USD
100003	12005431	2010	VAT	D	600,00	USD
100004	12005441	2010	VAT	L	500,00	USD
100004	12005441	2010	VAT	B	500,00	USD
100004	12005441	2010	VAT	C	500,00	USD
100005	12005451	2010	VAT	K	200,00	USD
100005	12005451	2010	VAT	K	200,00	USD
100005	12005451	2010	VAT	B	400,00	USD
100005	12005451	2010	VAT	B	400,00	USD
100006	12005461	2010	VAT	A	1.000,00	USD
100006	12005461	2010	VAT	A	1.000,00	USD
100006	12005461	2010	VAT	B	1.000,00	USD
100006	12005461	2010	VAT	B	1.000,00	USD

Query Format

The screenshot shows the 'Query Format' dialog in SAP Business Explorer. It is divided into four main sections:

- Free Characteristics:** A tree view containing 'Condition Type', 'Currency', 'Item Type', and 'Serial No'. Below this is the text 'Area for Dimensions'.
- Columns:** A tree view containing 'Key Figures', 'Amount', and 'AGGR - AMOUNT'. Below this is the text 'Area for Dimensions'.
- Rows:** A tree view containing 'Material', 'Billing Document Num', and 'Year'.
- Preview:** A table with columns: a-Material, a-Billing Do, a-Year, b-Year, and AGGR - A.

Query Out put Without Aggregation:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	\$ 600,00
100002	12005421	2010	\$ 400,00
100003	12005431	2010	\$ 1.800,00
100004	12005441	2010	\$ 1.500,00
100005	12005451	2010	\$ 1.200,00
100006	12005461	2010	\$ 4.000,00
Not assigned	#	#	0

We will explore what happens when we put various Exception Aggregation restrictions in this query:

Depending upon uniqueness of data exception aggregation can be put on any of the available characteristics (here we have used reference characteristic as Item Type from DSO data)

The screenshot shows the 'Properties' dialog for the 'AGGR - AMOUNT' key figure. The 'Aggregation' tab is active, showing the following settings:

- Exception Aggregation:** Exception If More Than One Record Occurs
- Ref. Characteristic:** Item Type
- Condition Type:** Currency (dropdown menu is open, showing options: Year1, Billing Document Num, Item Type, Material, Serial No)

Various possible combinations

1) **Total**: It behaves in the same manner as if there was no Exception aggregation applied to the query (visible in output below) ie it aggregates by standard OLAP functionality

The screenshot shows the SAP Business Explorer interface. The 'Rows/Columns' pane is divided into 'Free Characteristics' (Condition Type, Currency, Item Type, Serial No) and 'Columns' (Key Figures: Amount, AGGR - AMOUNT). The 'Rows' pane shows Material, Billing Document Num, and Year. The 'Properties' pane shows 'AGGR - AMOUNT (Formula)' with the 'Aggregation' tab selected, where 'Exception Aggregation' is set to 'Total' and 'Ref. Characteristic' is 'Item Type'. A preview table shows columns for a-Material, a-Billing Do, a-Year, and b-Year.

Query Output:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	\$ 600,00
100002	12005421	2010	\$ 400,00
100003	12005431	2010	\$ 1.800,00
100004	12005441	2010	\$ 1.500,00
100005	12005451	2010	\$ 1.200,00
100006	12005461	2010	\$ 4.000,00
Not assigned	#	#	0

2) **Maximum**: It will take Maximum Value for Each Billing Document with each unique Item Type

The screenshot shows the SAP Business Explorer interface. The 'Rows/Columns' pane is identical to the first screenshot. The 'Properties' pane shows 'AGGR - AMOUNT (Formula)' with the 'Aggregation' tab selected, where 'Exception Aggregation' is set to 'Maximum' and 'Ref. Characteristic' is 'Item Type'. A preview table shows columns for a-Material, a-Billing Do, a-Year, and b-Year.

Query Output:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	\$ 300,00
100002	12005421	2010	\$ 200,00
100003	12005431	2010	\$ 600,00
100004	12005441	2010	\$ 500,00
100005	12005451	2010	\$ 800,00
100006	12005461	2010	\$ 2.000,00
<u>Not assigned</u>	#	#	0

- As for Billing document No 12005451, 12005461 Item type is not unique hence the Maximum value is the sum of individual condition types

3) **Minimum:** It will Take minimum value for each Billing Document for unique Item Type

Query Output:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	\$ 100,00
100002	12005421	2010	\$ 200,00
100003	12005431	2010	\$ 300,00
100004	12005441	2010	\$ 500,00
100005	12005451	2010	\$ 400,00
100006	12005461	2010	\$ 2.000,00
<u>Not assigned</u>	#	#	0

- As for billing document No 12005451 Item type is not unique hence the Minimum value is the sum of individual condition types.

4) **Exception if more than one value occurs:** It will show data only for those billing documents for which at least one value is getting repeated for unique combination of item types. Here repeated values are present in Document No's: 12005421; 12005441; 12005461

Rows/Columns

Free Characteristics

- Condition Type
- Currency
- Item Type
- Serial No

Columns

- Key Figures
 - Amount
 - AGGR - AMOUNT

Area for Dimensions

Rows

- Material
- Billing Document Num
- Year

Preview

a-Material	a-Billing Do	a-Year	b-Year

Properties

AGGR - AMOUNT (Formula)

General Aggregation Display Advanced Cor

Aggregation

Exception Aggregation

Exception If More Than One Value Occurs

Ref. Characteristic

Item Type

Query Output:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	X
100002	12005421	2010	\$ 200,00
100003	12005431	2010	X
100004	12005441	2010	\$ 500,00
100005	12005451	2010	X
100006	12005461	2010	\$ 2.000,00
Not assigned	#	#	0

- As for document No: 12005451 item type K(200) and B(400) do not have same values hence no result in that row

5) **Exceptions if more than one value not equal to 0 occurs:** This behaves same as above except it does not treat 0 as a same value

6) **Average:** Depending upon various unique tem Types it averages the various values present for a particular Billing Document

Rows/Columns

Free Characteristics

- Condition Type
- Currency
- Item Type
- Serial No

Columns

- Key Figures
 - Amount
 - AGGR - AMOUNT

Area for Dimensions

Rows

- Material
- Billing Document Num
- Year

Preview

a-Material	a-Billing Do	a-Year	b-Year

Properties

AGGR - AMOUNT (Formula)

General Aggregation Display Advanced Conversions Planning Calculations

Aggregation

Exception Aggregation

Average

Ref. Characteristic

Item Type

Query Output:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	\$ 200,00
100002	12005421	2010	\$ 200,00
100003	12005431	2010	\$ 450,00
100004	12005441	2010	\$ 500,00
100005	12005451	2010	\$ 600,00
100006	12005461	2010	\$ 2.000,00
Not assigned	#	#	0

- For Billing document No 12005451, 12005461 Item type is not unique hence the Average value is the average of individual condition types ie for 12005451 $Avg = 1200/2 = 600$ and for 12005461 $4000/2 = 2000$ respectively

7) **Counter for All detailed Values:** Rather than displaying the value of key figure "Amount" It gives the No of values present for each combination of item types:

The screenshot displays the SAP Business Explorer configuration for a query. The 'Rows/Columns' pane is divided into 'Free Characteristics' and 'Columns'. Under 'Free Characteristics', 'Condition Type', 'Currency', 'Item Type', and 'Serial No' are listed. Under 'Columns', 'Key Figures' includes 'Amount' and 'AGGR - AMOUNT'. The 'Properties' pane shows the 'AGGR - AMOUNT (Formula)' configuration. The 'Aggregation' tab is active, showing 'Exception Aggregation' set to 'Counter for All Detailed Values'. The 'Ref. Characteristic' is set to 'Item Type'. The 'Preview' pane shows a table with columns 'a-Material', 'a-Billing Do', 'a-Year', and 'b-Year'.

Query Output:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	3
100002	12005421	2010	2
100003	12005431	2010	4
100004	12005441	2010	3
100005	12005451	2010	2
100006	12005461	2010	2
Not assigned	#	#	1

8) **First Value:** It gives the First value occurring in the amount field depending upon the sorted order of Item Types.

The screenshot shows the SAP Business Explorer interface. On the left, the 'Rows/Columns' pane is divided into 'Free Characteristics' (Condition Type, Currency, Item Type, Serial No) and 'Rows' (Material, Billing Document Num, Year). The 'Columns' pane shows 'Key Figures' (Amount, AGGR - AMOUNT). The 'Properties' pane on the right is set to 'AGGR - AMOUNT (Formula)' and has the 'Aggregation' tab selected, showing 'Exception Aggregation' with 'First Value' chosen. The 'Ref. Characteristic' is 'Item Type'. A preview table at the bottom shows columns for 'a-Material', 'a-Billing Do', 'a-Year', and 'b-Year'.

Query output:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	\$ 100,00
100002	12005421	2010	\$ 200,00
100003	12005431	2010	\$ 300,00
100004	12005441	2010	\$ 500,00
100005	12005451	2010	\$ 800,00
100006	12005461	2010	\$ 2.000,00
Not assigned	#	#	0

Please note that for Billing Document Number 12005451 the first value is Not 400 but 800 because the system looks out for the first value in a ascending order. As, Item Type B (400) comes before K(200) hence the value in query output = 800.

9) **Last Value:** It gives the Last value occurring in the amount field depending upon the sorted order of Item Type

This screenshot is similar to the first one, but the 'Properties' pane has 'Last Value' selected under the 'Aggregation' tab. The 'Ref. Characteristic' remains 'Item Type'. The preview table at the bottom is identical to the one in the first screenshot.

Query output:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	\$ 300,00
100002	12005421	2010	\$ 200,00
100003	12005431	2010	\$ 400,00
100004	12005441	2010	\$ 500,00
100005	12005451	2010	\$ 400,00
100006	12005461	2010	\$ 2.000,00
Not assigned	#	#	0

Please note that for Billing Document Number 12005451 the last value is Not 800 but 400 because the system looks out for the last value in a descending order. As, Item Type K (200) comes before B(400) hence the value in query output = 400.

10) **Standard Deviation:** After drilling down according to the reference characteristic, the standard deviation of the displayed values is displayed in the results row.

The screenshot shows the SAP Business Explorer interface with the following configuration:

- Rows/Columns:**
 - Free Characteristics:** Condition Type, Currency, Item Type, Serial No.
 - Columns:** Key Figures > Amount > AGGR - AMOUNT.
 - Rows:** Material, Billing Document Num, Year.
 - Preview:** a-Material, a-Billing Do, a-Year, b-Year.
- Properties:**
 - AGGR - AMOUNT (Formula)
 - Aggregation: Exception Aggregation, Standard Deviation.
 - Ref. Characteristic: Item Type.

Query Output:

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	\$ 100,00
100002	12005421	2010	\$ 0,00
100003	12005431	2010	\$ 129,10
100004	12005441	2010	\$ 0,00
100005	12005451	2010	\$ 282,84
100006	12005461	2010	\$ 0,00
Not assigned	#	#	0

* Please note no value is present for billing docs which have 0 deviation i.e. all values are same

11) **Variance:** After drilling down according to the reference characteristic, the variance of the displayed values is displayed in the results row.

The screenshot displays the SAP Business Explorer configuration interface. It is divided into several sections:

- Rows/Columns:**
 - Free Characteristics:** Lists 'Condition Type', 'Currency', 'Item Type', and 'Serial No'.
 - Columns:** Shows a hierarchy with 'Key Figures' containing 'Amount' and 'AGGR - AMOUNT'.
 - Rows:** Lists 'Material', 'Billing Document Num', and 'Year'.
 - Preview:** A small table showing columns 'a-Material', 'a-Billing Do', 'a-Year', and 'b-Year'.
- Properties:**
 - Formula: 'AGGR - AMOUNT (Formula)'.
 - Aggregation: 'Exception Aggregation'.
 - Ref. Characteristic: 'Item Type'.

Query Output

Material	Billing Document Num	Year	AGGR - AMOUNT
100001	12005411	2010	10.000
100002	12005421	2010	0
100003	12005431	2010	16.667
100004	12005441	2010	0
100005	12005451	2010	80.000
100006	12005461	2010	0
Not assigned	#	#	0

* Please note no value is present for billing docs who have 0 Variance i.e. all values are same

Result:

To calculate the value of key figures, the data from the InfoProvider has to be aggregated at the detail level for the query. It is possible that formulas also have to be calculated. In this case, several characteristics have to be aggregated. For each key figure, one selected characteristic can be aggregated with another rule. Hence we use exception aggregation to apply customized aggregation on a calculated key figure.

Related Content

www.sdn.sap.com,

<https://help.sap.com>

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