CALCULATION ENGINE FOR CREATIO

Guide to setup and utilization

15.06.2023

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PRODUCT DESCRIPTION

Sales'Up Calculation Engine for Creatio — is a solution that allows you to independently, without involving a developer, set up the rules for calculating numerical values (formulas) in existing fields of objects in the Creatio system.

Utilization options

The «Sales'Up Calculation Engine for Creatio» is a tool that helps to effectively manage the calculation of enterprise performance indicators using formulae created by users. In the context of the system, you can work with numerical data and data of the date type of any Creatio object.

For example:

1. Calculation of planned indicators for the product;

2. Calculation of the amount of shipments;

3. Calculation of the minimum price value for the product;

4. Calculation of the number of days between the date of creation and the date of completion of the activity;

5. Calculation of the regular price according to the agreement

Key advantages:

1. Setting up the calculation of fields using formulas without involving a developer.
2. Convenient and simple interface for creating formulas.
3. Using all possible mathematical functions to calculate column values.

Opportunities

1. The module allows you to set up an unlimited number of formulas;
2. It allows you to create calculation formulas without involving a developer;
3. The module processes set up formulas quickly;
4. It calculates formulas of any complexity.

Notes and restrictions

The Calculation Engine product works exclusively with numerical data and dates. There is no possibility to work with text, time, images, files, etc. when setting up formulas.

Technical requirements

Calculation Engine for Creatio is compatible with all products on the Creatio platform version 7.13 and higher.

Features for an on-site solution: for convenient and fast calculation of values using formulas, it is recommended to make sure that the application server has free RAM. For example, to fill in 3 million calculating fields, you need to have at least 8 GB of RAM.

Installation and setup of the product

## Installation of Calculation Engine product

The Calculation Engine module is provided by Sales'Up upon request.

First, you need to request an up-to-date package from Sales'Up support. Next, on the "Applications" page, click "Installed applications", specify the path to the archive with the package and complete the installation.

Setup and utilization of Calculation Engine product

New setting adding

In order to set up a new setting, go to the system designer and in the "Sales'Up System setup" section, select the "Calculation engine" section.
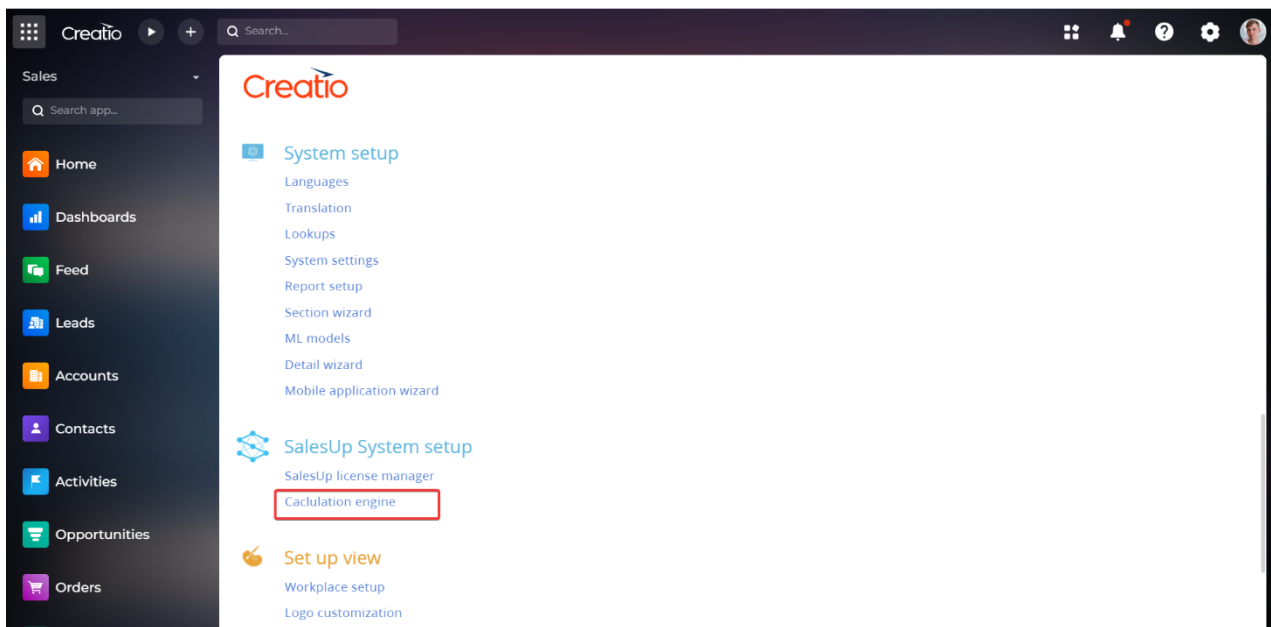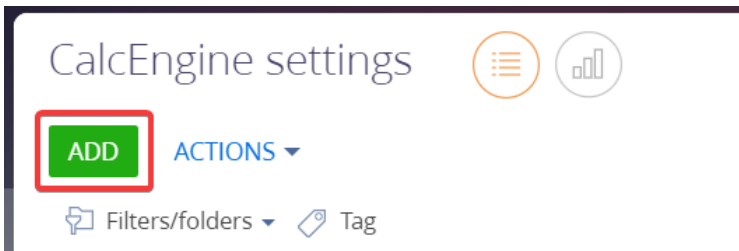

Filling the page with data

### Adding of an object to 'CalcEngine settings' section

The Calculation Engine module is used to set up formulas for calculating values in existing fields of Creatio system objects.

To add a new object, you need to:

1. Go to 'CalcEngine settings' section;
2. Press 'Add' button;

3. On the record page, you must fill in all the required and additional fields:

    a. Name – title by which system users will identify the current record. It is recommended to enter a unique name;

    b. Object – selection of the object in which it is necessary to calculate the values for the columns;

    c. On client – enabled if it is necessary to perform calculations on the page;

    d. On server – enabled if it is necessary to perform calculations on the application side;

   e. Don't close the edit card – this indicator is set if it is necessary not to close the page.
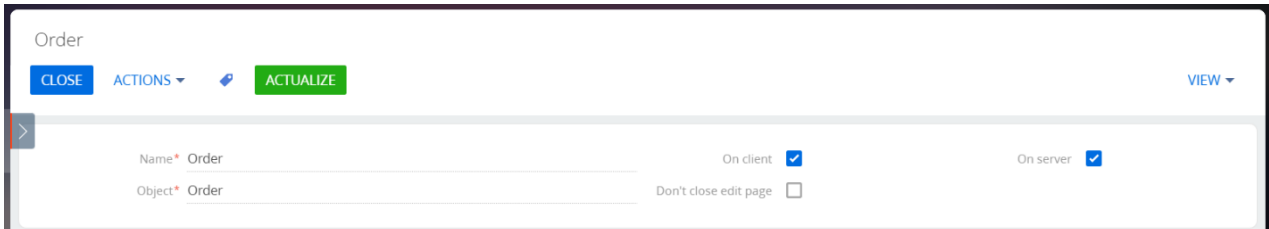
4. To save a new record, it is necessary to press 'Save' button.

Filtering in the object setup

If while calculating the value it is necessary to use only a certain part of the records of the selected object, then in this case it is recommended to configure the filtering of the records. To do this, follow these steps:

1. In the "CalcEngine Settings" section, add a new record (to add a new record, use the instruction 3.2.1.1 Adding an object to the "CalcEngine Settings" section);

2. Go to «Filters» tab;

3. Add rules of object records' filtering;
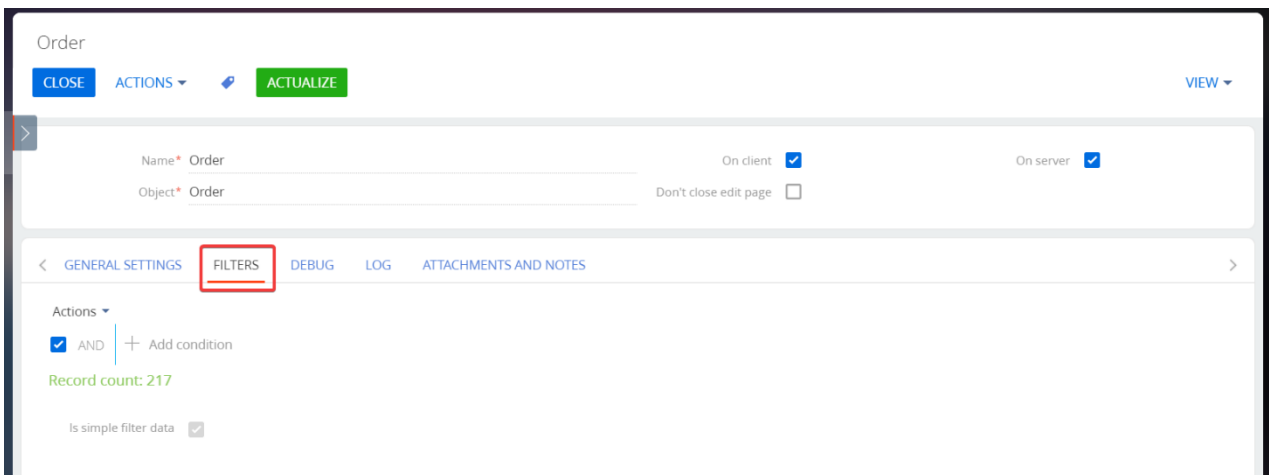
An example of filter setup:
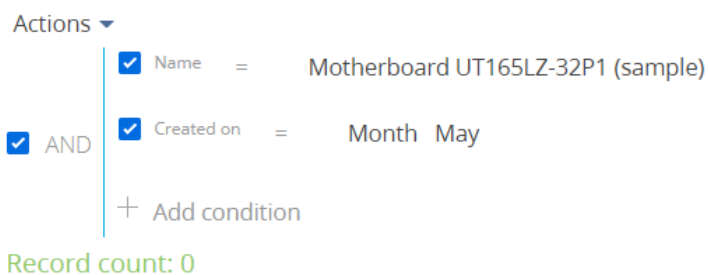
4. To save a filter, it is necessary to press 'Save' button.

Setup of the "Columns" detail of the "General Settings" tab

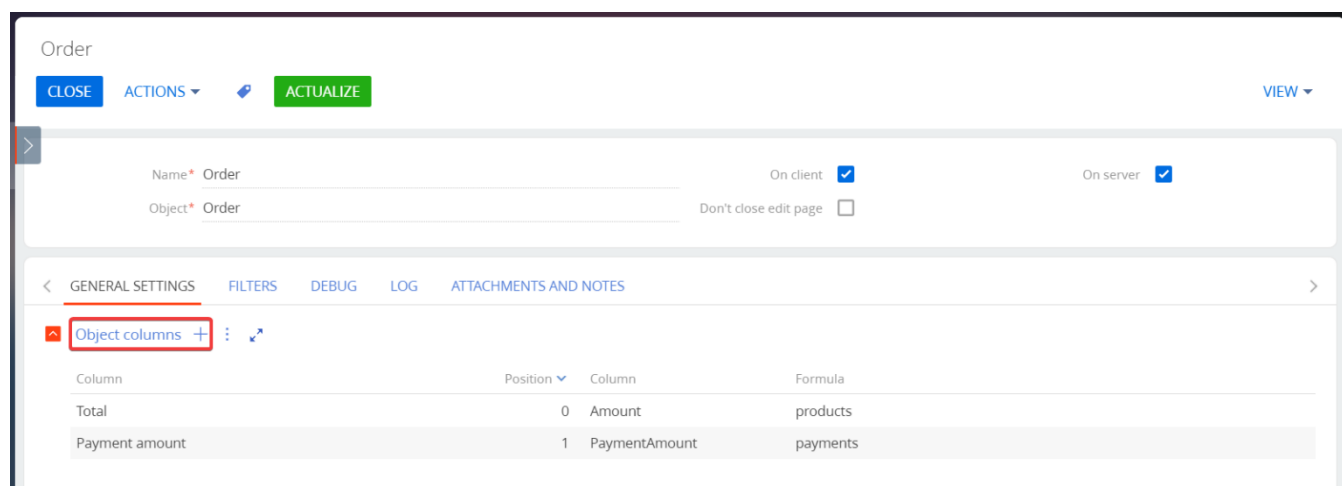The "Object columns" detail is used to create formulas for several columns of one object.

To add a new column for formula calculation, you need to:

1. On the "Columns" detail of the "General Settings" tab, click the button for adding a new record (+);

2. On the indicator record page, you must fill in all the required fields:

   a) Column - selection of the field for which the value is calculated according to the specified formula;

   b) Formula - this field specifies the formula for calculating the value for the selected column. Features of writing a formula:

   I. If the value does not need to be calculated, but only to be selected from a specific object, then a variable is indicated in this field, for example "n";

   II. All variables are set solely in Latin;

   III. If it is necessary to use a constant in the formula, then it is written in the current line as a number;

   IV. While writing a formula, it is allowed to use engineering functions, for example, raising a variable to a power, calculating the square root of a variable, etc.

To see possible mathematical operations, a corresponding hint has been added to the system.

To use the hint, you need to move the mouse cursor over the green triangle in the left corner of the "Formula" field.
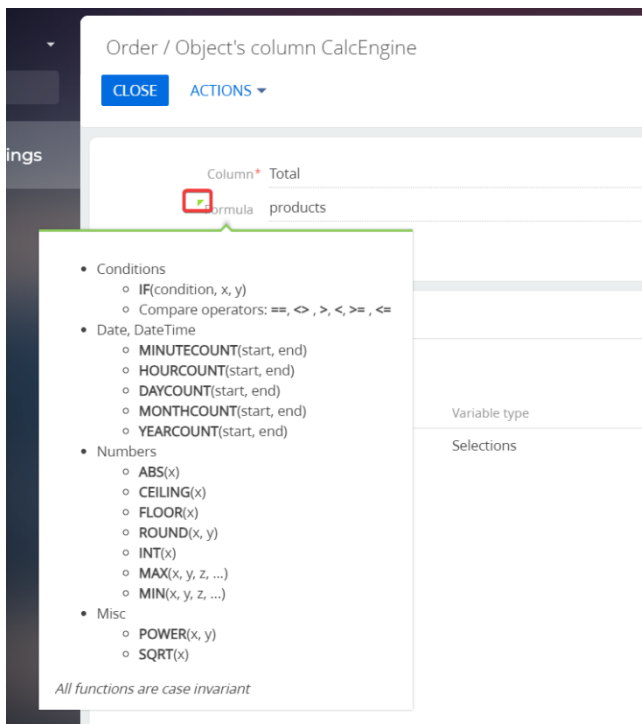
List of used functions:

- IF(condtion, x, y) – conditional function. If condtion is TRUE, return x, or y;

- DAYCOUNT(start, end) – number of days between dates;

- MONTHCOUNT(start, end) –number of months between dates;

- YEARCOUNT(start, end) –number of years between dates;

- ABS(x) – absolute value (module);

- CEILING(x) – rounding up;

- FLOOR(x) – rounding down;

- INT(x) – take the integer part of the number;

- MAX(x, y, z, …) – select the largest of the values (IMPORTANT! Each expression is separated by a comma and a space);

- MIN(x, y, z, …) – select the smallest of the values (IMPORTANT! Each expression is separated by a comma and a space);

- EXP(x) – exponent;

- LOG(x) – decimal logarithm;

- LN(x) –natural logarithm;

- POWER(x, y) – raising x to the power y;

- SQRT(x) – square root ;

- ACOS(x) – arc cosine;

- ASIN(x) –arc sine;

- ATAN(x) – arc tangent;

- COS(x) – cosine;

- SIN(x) – sine;

- TAN(x) – tangent;
- PI() – Pi.

An example of writing formulas 1:

Trademark / Object's column CalcEngine

CLOSE   ACTIONS ▼

Column* Number of days, Trademark
Formula DAYCOUNT(start, end) + 1

An example of writing formulas 2:

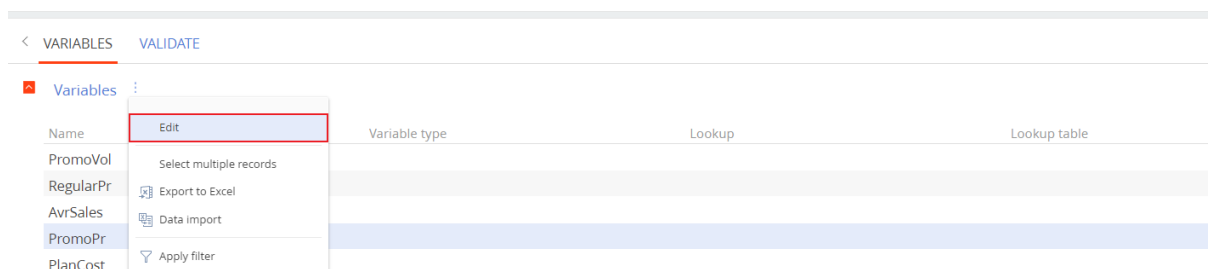**Trademark / Object's column CalcEngine**

CLOSE   ACTIONS ▼

Column* PSI
Formula (PromoVol * PromoPr * AvrSales * RegularPr) / PlanCost
Disabled ☑

3. To save the new entry, click the "Save" button.

4. When you save a record, all variables from the "Formula" field are automatically added as separate records to the "Variables" detail. Setting variables is described in paragraph 3.2.1.4 Setup of variables.

Setup of variables

In order to set up a variable, you have to:

1. In "CalcEngine Settings" open an existing record;

2. In the "Variables" detail of the tab of the same name, select a variable and proceed to editing it (double-click on the variable with the left mouse button or use the "Edit" menu item of the action button);

	VARIABLES	VALIDATE			
Variables					
Name	Edit	Variable type		Lookup	Lookup table
PromoVol					
RegularPr	Select multiple records				
AvrSales	Export to Excel				
PromoPr	Data import				
PlanCost	Apply filter				

3. On the variable record page, you must fill in all the required fields:

   3.1. The name is the variable itself. Set automatically when the formula is saved. Not available for editing;

   3.2. Variable type - in this field, a value is selected that indicates the source of the value for this variable. The following values are available for selection:

1) Selections - used when the data for a variable is selected from an existing section, detail or other system object. For this type, it is allowed to work with an array of data;

2) System setting - used if the value of the current variable is selected from the system setting;

3) Lookup - used if the data for the variable is selected from an existing directory. In this case, the user works with only one directory entry.

4) Object column - used if the data for the variable is selected from the current object.

PSI / Formula's variable of CalcEngine

SAVE   CANCEL   ACTIONS ▼

Name PromoPr

Variable type Selections

When setting the variable type, the system dynamically generates a part to set additional characteristics of the variable.

4. Set variable settings with different types:

4.1. For a variable with the "Selections" type, it is additionally recommended to configure the following parameters:

1) Object – select an object whose data will be used to calculate the value of the current variable;

2) Function - one of the aggregating mathematical functions is selected: sum, quantity, minimum value, maximum or average, the first record of the sample. If you select the "Quantity" value, you do not need to specify the column name. If you select the "First record of the selection" value, you must fill in the following fields:

      i. Sort selection by column - select the column by which you want to sort the selection;

      ii. The sort order of the selection is the choice of "descending" or "ascending";

■ Selection

Object	Trademark	Order selection by column*	Modified on
Function*	Top1	Order direction*	Ascending
Column name from which the value is taken*	"Price per unit"		

3) Column name from which the value is taken - the column of the previously selected object is indicated, the data of which will determine the value of the current parameter.

What can I do for you? > Creatio
7.18.4.1532

CLOSE   ACTIONS ▾

Name PromoPr
Variable type Selections

🔴 Selection

Object Trademark
Function* Avg
Column name from which
the value is taken* Recommended shelf price

🔴 Relationship with master object + ⋮

Main object column path name	Comparison type	Main object column path caption
Id	Equal	Id

🔴 Filter

Actions ▾

☑ AND | + Add condition

🔴 Offset from current moment ⓘ

Use offset ☐   Offset 0   Offset unit
Offset column caption   Duration 0   Duration unit

4) Additionally, you can configure data filtering. Filtering is configured in the same way as described in paragraph 3.2.1.2 Filtering setup.

5) Additionally, you can specify the data offset in the sample. An offset is used if the value of a variable needs to be calculated based on historical data, but not data on the current period. For example, the planned sales volume can be set as the sum of actual sales for the same month of the previous year. On the "Offset" detail, you must fill in all the fields:

i.   Use offset - when this feature is enabled, the data for the sample can be taken not for the current period, but as historical data;

ii.   The name of the column by which the offset is performed - the record field of the object by which the offset is configured;

iii. Offset - indicates the time shift in the formation of the sample relative to the current period of time. If it is necessary to take existing historical data, then the shift value will be negative. When using a positive shift value, data from future periods will be included in the sample. For example, "-1 year", "3 month"

iv.   Duration – indicate how many periods should be analyzed in the sample to calculate the value of the indicator. For example, planned direct sales can be calculated as the average of actual direct sales over the previous 3 months. In this case, the duration will be indicated as "3 months". If, during the shift, a period similar to the current one is analyzed, then in this block of fields it is recommended to set the value "1 period", where the period is equal to the value of the "Unit of time" field of this

🔴 Offset from current moment ⓘ

Use offset ☐   Offset -1   Offset unit Year
Offset column caption Created on   Duration 1   Duration unit Month

6) Additionally, you can set up the "Relationship with the main object" detail, which is used to establish a link between this variable and the object in which the calculation formula is set up.

To add a connection, you need to click the add data button (+) on the detail and fill in the required fields:

i.   Title of the path to the column of the main object - the field of the record of the main object;

ii.   Comparison type - selection of the condition by which the data will be determined (greater than, greater than or equal to, less than, less than or equal to, not equal to, equal to).

iii. The title of the path to the column of the associated object is the field of the object record, according to which the calculation formula is configured.

For instance: There is a Trademark with the fields "Start date" and "End date" filled in, and Shipments with the "Shipping date" field filled in. It is necessary to display all shipments for the TM Activity period (Period: Start date and End date).

To meet this condition, it is necessary to create 2 records on the part:

1 – Shipment with the "Shipment Date" field is greater than/equal the Activity TM with the "Start Date" field;

2 – Shipments with the Shipment Date field is less than the Activity TM with the Completion Date field.

Master object: "Invoice" / Binding object: "Product in invoice"

CLOSE   ACTIONS ▾

Main object column path caption	Id
Comparison type	Equal
Binding object column path caption	Invoice.Id

4.2. For a variable of the "Object column" type, you must additionally set up the following parameters:

1)   Name of the column of the object - you must select one of the existing columns of the section. The field will display the name of the column in the object;

2)   Object column title – is filled in automatically with the name of the column that is selected in the "Object column title" field.

Total / Formula's variable of CalcEngine

CLOSE   ACTIONS ▾

Name	a
Variable type	Object column

⌃ Object column

Object column name*	Amount	Object column caption	Total

4.3. For a variable of type "System setting", you must additionally configure the "System setting" parameter. It indicates one of the existing system settings;

Total / Formula's variable of CalcEngine

CLOSE   ACTIONS ▾

Name	d
Variable type	System setting

⌃ System setting

System setting*	Current order number

4.4. For a variable of the "Reference" type, you must additionally configure the following parameters:

1) Lookup – you must select one of the existing directories of the system;

2) Column name for a numerical value - in this field, you must specify the name of the column that contains numbers (to perform calculations using a formula);

3) Lookup record - specify the record which data will be used in calculations.

5. To save the records of a variable, press "Save" button.

Setting up filtering in variables

Data filtering is configured only for variables of the "Selections" type. It is used to form an array of records, the data of which should be included in the calculation of the value of such a variable.

To set up filtering for a variable, you need to:

1. In the object, open the record of the variable;

2. Go to the page for editing a variable with the "Selections" type;

3. On the "Filter" detail, add the rules for filtering records;

An example of filter setting:
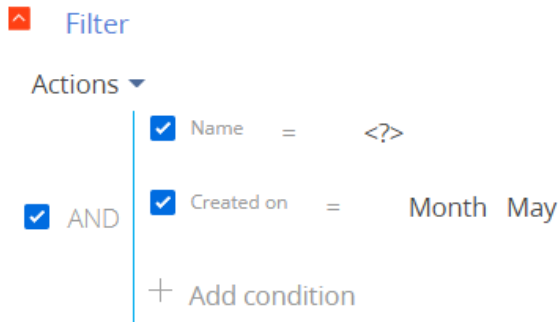
4. To save a filter, press "Save" button.

5. Optionally, you can specify the data offset in the selection. The offset setting is specified in paragraph 3.2.1.4 Settings variables, subparagraph 4.1.

Changing an existing record on the "Columns" detail

To change an existing entry:

1. In the "CalcEngine Settings" section, open an existing record;

2. Go on the "Columns" detail;

3. On the "Columns" detail of the "Basic settings" tab, select the record you want to change, then press the action button (⋮) and select the "Edit" menu item;
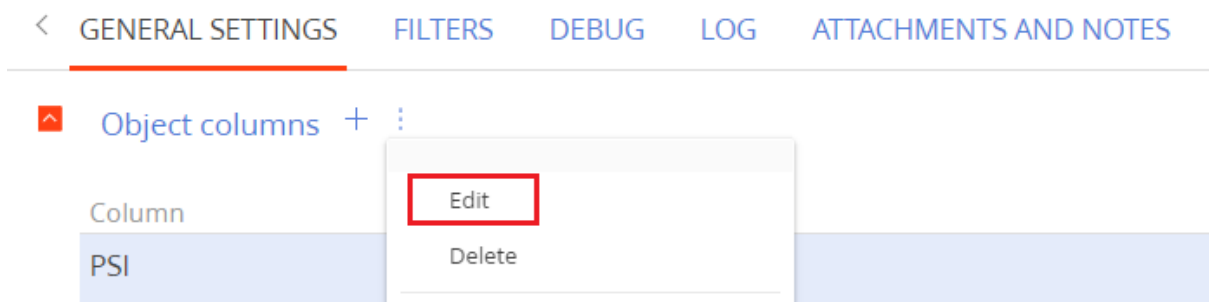
4. Make changes on the record page that opens, save the changes.

How to work with the indicator record page is described in paragraphs 3.2.1.4 Settings variables и 3.2.1.5 Setting filtering in variables.

Deleting an existing record on the "Columns" detail

To delete an existing record:

1. In the "CalcEngine Settings" section, open an existing record;

2. On the "Columns" detail of the "Basic settings" tab, select the entry you want to delete, then press the action button (⋮) and select the "Delete" menu item;
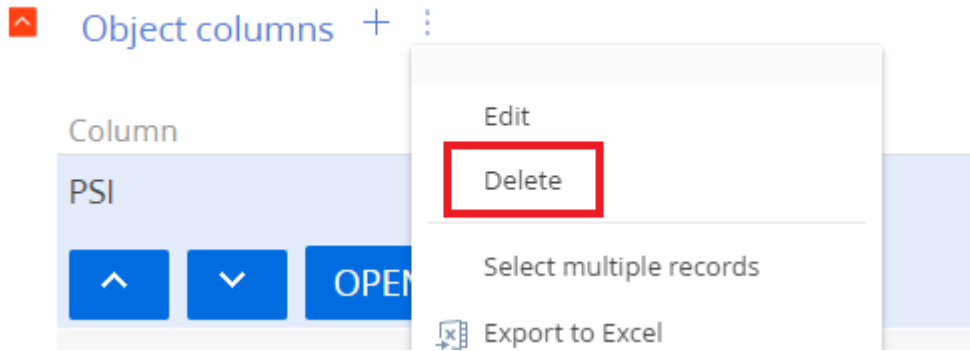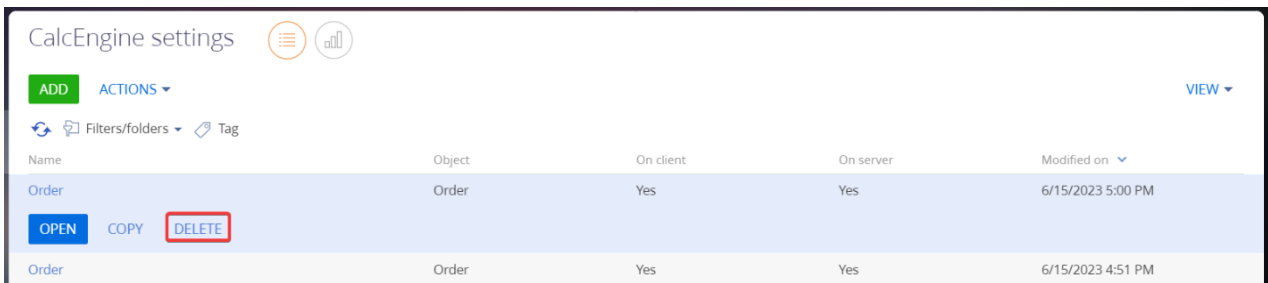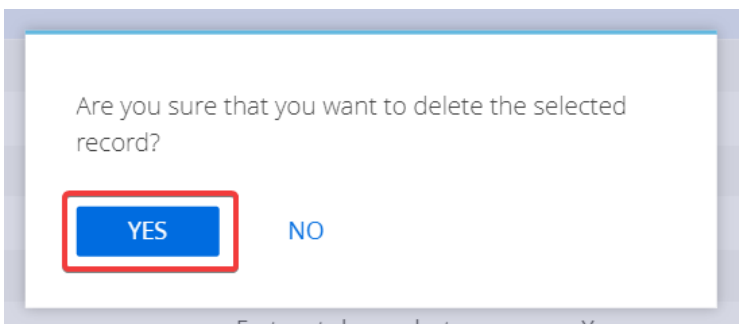
3. Confirm the deleting of a record.

Deleting a record in "CalcEngine Settings"

To delete an entry in the "CalcEngine Settings" section, you must:

1. Go to the "CalcEngine Settings" section;

2. Select the entry to be deleted;

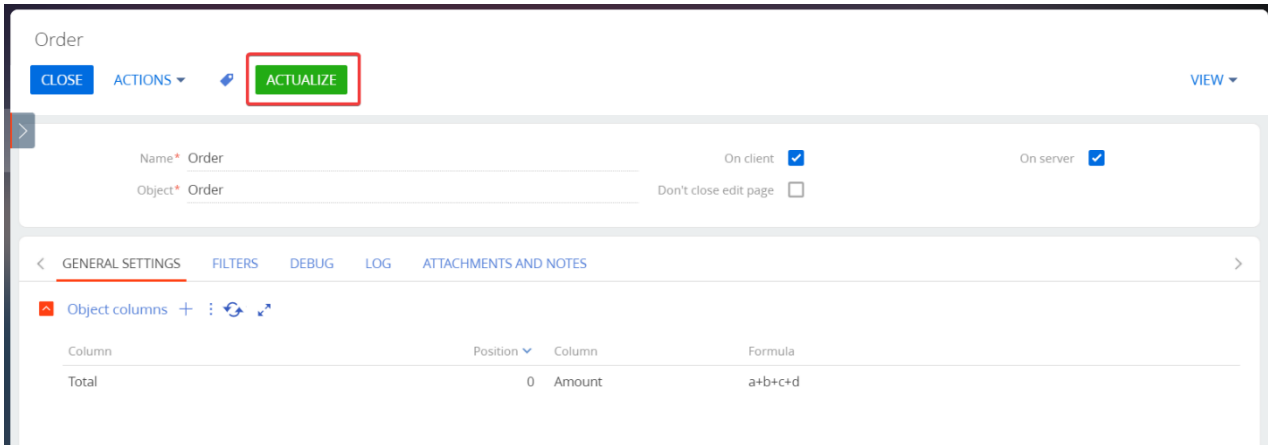3. Press the "Delete" button:

4. Confirm deleting of a record:

## Formulas actualization in «CalcEngine Settings» section

The "Actualize" button is used to start the process of calculating the customized formulas.

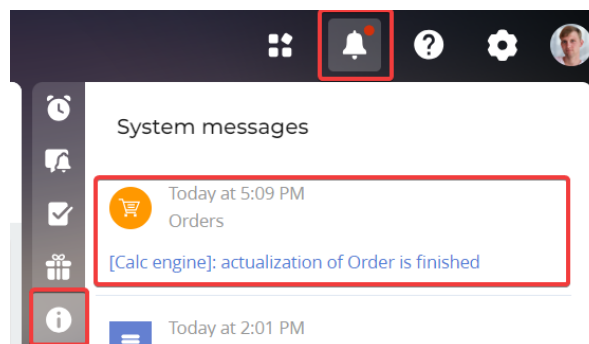To start calculating formulas, you must:

1. Open an existing object in the "CalcEngine Settings" section;
2. Press «Actualize» button:

3. After starting the update, a window will appear on the screen with a notification about the start of the update:
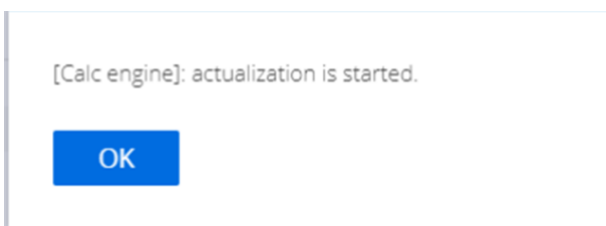
4. After the calculation of the formulas is completed, the notification panel will show information that the update is over.

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