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1 Introduction: What you can do with formulas

Formulas are widely used in RT Report Manager. They give you the flexibility to calculate the value of the field during the processing time taking in consideration the values the other parameters and variables. Formula can be used for:

1.1 File or folder name

Create a file name based on date and time, customer name, sales person name, report type, state etc. like:

- <Date> Sales <Employee> : Nov 2010 Sales Carol; Dec 2010 Sales Carol; Dec 2010 Sales John
- Loss ratio Top <Value>% customers: Loss ratio Top 10% customers; Loss ratio Top 20% customers

1.2 Parameter values

Set default value for a parameter. Most of the reports have specific requirements for parameter values. For example:

- Sales report most likely will have "Date From" and "Date To" parameters. Depending on your reporting period soon you will find that each time you want to run the report you are selecting the beginning and the end of the previous week, month quarter etc.
- You may have a report, which accepts a parameter from a list and you want the list in specific order. For example: List of the customers ordered by the percentage of the sales drop. List of the items ordered by the number of returns.
- User who run the report

1.3 Email address

Email addresses could be assigned directly from job data. 2 job types provide internal values: Data driven job or Bursting job. In Data driven job, the values returned from data query are available and the email can be assigned directly

🖃 Send e	nail wizard							
← Bac	(Back							
Email	settings							
То	Recordset Field: Email				🗶 <u>f</u> r			
Subject	🛯 🕙 🔑 🚨				fx			
Subject	Existing functions Command	^			1.0			
Com	Recordset fields from Job Command		erences	Mail Merge	Review			
	Name							
	Email							
New	Application Variables							
	SampleFolder							
	CompanyName							
Dear	V V							
Dear	^	.::						

1.4 Mail merge

Job related values are available also in mail merge

Comman	ds File	Home	Insert	Page Lay	out R	eferences	Mail Merge
fx Create Expressicn M	Insert lerge Field ~	Show All Field Codes F	Show All Field Results	View Merged Data			
Dear { M	[Records [Records [Records	et Field:Ema et Field:ID] et Field:Nam	il] Nar	me]" }			

1.5 Embedded files

You can create a task to export report to HTML or Image and access these file as references to ambed them in Email's body



2 Available formula types

RT Report Manager supports 3 types of formulas

2.1 Relative date

If you think about the difference between 2 runs of one report you will see that everything is related to only one variable: Time (Date). If you have a report "Sales" with parameters "Customer" and "As Of Date" and you are running it for the end of each month you will insert always the same customer name (or ID) for the first parameter, but the value for the second parameter (As of Date) will be different. You can automate this report if you find a way to tell the reporting engine to use always the end of the current month as a value for the second parameter.

Relative dates are dates for which you know just the relation to the current date. For example previous month end will be different depending of the current date

Current ate	Previous month end
6/5/ <mark>2011</mark>	<mark>5/31/2011</mark>
5/23/ <mark>2011</mark>	<mark>5/31/2011</mark>
<mark>3/5</mark> /2011	2/28/2011 <mark>end of</mark>
	<mark>February</mark>
<mark>3/5</mark> /2008	2/29/2008 <mark>end of</mark>
	February

No matter on which date in June 2011 you will run the "Sales" report "parameter "As of date" will be set to 5/31/2011, when you run it next month the parameter value will be 6/30/2011.

In order to make possible to use relative dates RT Report Manager is extending the regular date control. A button "Relative" is added. This button has 2 states:

rltv rltv

1.

- not pressed normal dates
- 2. pressed relative dates

Normal dates mode:

Value r	rltv 30	/10/20	22 00:0	0:00					- fx
30 October 2022								ert filter)	
	AIW	4		Octob	er 202	22		Þ	or c nitter)
_		MC	TU	WE	TH	FR	SA	SU	
	Mul	40 26	27	28	29	30	1	2	Ψ
	Valu 4	41 3	3 4	5	6	7	8	9	
	ہ انہوں 1	42 10	11	12	13	14	15	16	- Manager
		43 17	18	19	20	21	22	23	ort Manager
	4	44 24	25	26	27	28	29	30	
Value Format [Descr	45 31	. 1	2	3	4	5	6	
Prev Clear						Cancel			

Select a date like any other date control. The value will be a fixed date as 1/1/2011, 6/23/2011 etc.

Value ritv	ast day of month, previous month	- fx
Alw Mul	Day Week Month Quarter Year Month Offset -1 + Days Offset Last Day +	00:00 🗘
Value Format Descr		ок
Prev		Cancel
	Description	
	Last day of month, previous month	

Relative date mode:

You will be able to choose the offset from the current date instead of a fixed date.

The value will look like this: Day 5 days ago, End of previous week, End of February previous year, Beginning of the next month etc.

There are 5 types of offsets that you can set:

2.1.1 Day

l	Day	Week	Mon	nth	Quarter	Year			
			00:00 ‡						
l	4	October 2022							
		MO	TU	WE	тн	FR	SA	SU	
	40	26	27	28	29	30	1	2	
	41	3	4	5	6	7	8	9	
	42	10	11	12	13	14	15	16	
l	43	17	18	19	20	21	22	23	
	44	24	25	26	27	28	29	30	OK
	45	31	1	2	2 3	4	5	6	Cancel
Ì	Description								
	the same day								

You can choose the date directly from the calendar, but the program will save the difference to the current date. Let say today is 7/3/2011. By selecting 7/2/2011 you will tell the program to always use the previous day date and if you run it on 8/1/2011 the calculated relative date will be 7/31/2011 (the previous day compared to 8/1/2011). This type of offset can be useful if you have a report which shows the data for a period and you want to set the period to dates compared to current date: last 5 days, next 10 days etc.

2.1.2 Week

Day Week Mor	nth Quarter Year					
Week Offset	0 ‡		00:00 ‡			
Weekday	Sunday Monday Tuesday Wednesday Thursday Friday Saturday	* *				
			ок 🔓			
			Cancel			
Description						
Sunday, this week						

In case you want to set a date to previous

Monday you can use week offset. Field "Week offset" will set the offset to the current week. If it is 0 current week will be used. -1 for the previous week, +1 for the next week etc.

This type of offset can be useful if you have a report which shows the data for the previous week, next week, last 2 weeks etc.

2.1.3 Month

Day Week Month Quarter Year							
Month Offset	-1 👘		00:00 ‡				
Days Offset	Last Day	-					
	First Day						
	Last Day						
	Days From the Beginning	13					
	Days Before the End						
			OK				
			Cancel				
Description							
Last day of month, previous month							

In case you want to set a date to previous month end you can use month offset. Field "Month offset" will set the offset to the current month. If it is 0 current month will be used. -12 for the same month 1 year ago and +1 for the next month.

This type of offset can be useful if you have a report which shows the data for the previous month and especially if you need the month end date.

2.1.4 Quarter

Day Week Mor	nth Quarter Year					
Quarter Offset	0 ‡	00:00 ‡				
Days Offset	First Day 👻					
	First Day					
	Last Day					
	Days From the Beginning					
	Days Before the End					
		OK				
		Cancel				
		Carleer				
Description						
First day of quarter, this quarter						

In case you want to set a date to previous quarter end you can use quarter offset. Field "Quarter offset" will set the offset to the current quarter. If it is 0 current quarter will be used. -4 for the same quarter 1 year ago and +1 for the next quarter.

This type of offset can be useful if you have a report which shows the data for the previous quarter and especially if you need the quarter end date.

2.1.5 Year

In case you want to set a date to specific date previous year you can use year offset. Field "Year offset" will set

Day Week Mo	nth Quarter Year					
Year Offset		0 ‡	00:00 ‡			
Туре	Quarter	-				
Quarter	First	-				
Days Offset	First Day	-				
			ок Д			
			Cancel			
Description						
First day of the first quarter, this year						

the offset to the current year. If it is 0 current year will be used. -2 for 2 years ago and +1 for the next year.

This type of offset can be useful if you have a report which shows the data for a specific date like end of February previous year or Last of the second quarter 2 years ago.

Relative dates will give you the flexibility to set values for dates related to current date. This is critical for the scheduled reports where you don't know the date when the report will be run.

2.2 Expression

Relative dates are a powerful way to set date values without any programming experience. However there are things that require some further complexity. If you want to save the "Sales" report from the previous example to a file "Sales report as of <date of the report>.pdf" you need a way to specify the file name with some variables. This is the place where you will use expressions.



This screen has similar functionality as the Crystal report's or Excel's interface used to prepare expressions. The selection in the first list will determine the items shown in the second one. Double click on the item in the second list to add it to the expression. As screenshots above show selecting "Columns" will load report parameters and fields in the second list. The example above is using one of the built-in functions "DateToString", to convert the date value to a string in order to use it in the file name. Without this conversion there will be an error



In addition, you can choose the function from the intelisense drop down while typing

Expression Editor			Dat	eTime Parameter:End Date	×
'Sales as of ' +	Date[Parameter:End Date]		Category: Columns		
Invalid input character: ":".	Parameter:End Date				
	Parameter:Start Date				
	🚛 Report Field:Orders.Order Date				
	JATEDIFFDAY(,)				
	DATEDIFFHOUR(,)				
Columns	JEDIFFMILLISECOND(,)		Q	DateTime Parameter:End [Date
Constants	JATEDIFFMINUTE(,)				
Eunctions	<pre> f DATE DIFFMONTH(,) </pre>	-	^		
DateTime	ab Recordset Field:Email				

Some expressions can be pretty complex and will require some testing. Click on button "Test" to do that. Another dialog screen will be shown where you can set the variable values and check the result.

Variables		
Recordset Field:ID	_	99 🌲 🔺
Recordset Field:Name	Sample text	
Recordset Field:Email	Sample text	
Parameter:EmployeeID		99 🌲
Parameter:Start Date	30/10/2022	
Parameter:End Date	30/10/2022	-
Parameter:Current user	Sample text	
Parameter:Current comp	Sample text	-
Result		Recalculate
Sales as of 10-30-2022		4
		~
		Class

Expressions will give you additional flexibility to get the desired values. You need to have basic knowledge about the functions. If you are using functions in Excel, you will be able to use expressions editor without any problem.

Please contact us at <u>support@r-tag.com</u> if you need help with expressions.

2.3 C# source code

This is the most powerful way to calculate dynamic values. You will need to have at least basic programming knowledge. RT Report Manager provides fully functional C# editor with intellisence and error reporting.

🖳 Formula Editor					
File					×
🛃 🖄 🗔 🏊 🔩 🚳					
Documents 🗜 🗙	RilterNamespace. ValueFunctions	•	∲ GetFile≀	Name()	•
Documents # x -=== Using Directives -=== Using System -=== Using System -=== Using System -== Using FilterComponents; -= Using FilterComponents; -= Using FilterComponents; -= Using FilterComponents; -= Dealer -= System.String value=null; -= Using FilterComponents; -= Catch (Exception) -=		() as of "	+ rta 1 Gets key: Exce Sy Sy	gParameters [¹ @As of 3 → ²² Parameter Ke s the element with the sp : The key of the element aptions: stem.ArgumentNullExe rstem.Collections.Generic	OfDate"] yedCollection <string.parameter>[string key] ecified key. to get. ption c.KeyNotFoundException</string.parameter>
Errors			t mit		4 X
Image Number Description		Line Co	76 File	e Project	
r I; expected		23	70		
Ln 23 Col 64 Ch 64 C#	DefaultState StringLiteral (*)				0

Intellisence is available in a similar way as in Visual Studio

try {		I
Parameter asOfDate = rtJobP string strAsOfDate = asOfDa	Parameters["AsOfDa te.To	ute"];
<pre>} catch (Exception) { throw; } return value;</pre>	AdditionalData Capacity Code Capacity Code Capac	<mark>string object.ToString()</mark> Returns a string that represents the current object.

In case you try to save code with errors, you will see the error description and the exact position of the error.

<	49 50 51 52		try {	Parameter asOfD string strAsOfD)ate = rtJob))ate = asOfDa	Parameters["AsO: ate.To	fDate	"];			
Err	ors										
	I	Description					Line	Colu	File	Project	
Þ.	1	; expected					52	37			

There are some shared objects between the main application and your code. For example, in reports and jobs parameters collection will be shared through the object rtReportParameters and rtJobsParameters. You can get any of the parameters including additional data assigned by RT Report Manager.

ReliterNamespace.ValueFunctions **-**#@GetValue_txt_File_Name() 1 using System; 2 Lusing BEvents; 2 4 = **#region** ReadOnly Section 5 namespace FilterNamespace 6 🗄 { 7 [Serializable] 8 public class ValueFunctions 9 🚊 | - { 10 // Job Parameters private Parameters jobParameters; 11 public Parameters rtJobParameters 12 13 🕁 |· · ·| private string _currentUser; 17 18 public string currentUser 19亩 |•••| // Report Parameters 23 private Parameters reportParameters; 24 public Parameters rtReportParameters 25 26 🕁 . . . 30 // Row values 31 private System.Data.DataRow dataRowValues; public System.Data.DataRow rtDataRowValues 32 33 🕁 . . . 37 // Step Counter private int intCurrentStepIndex; 38 public int rtCurrentStepIndex 39 40 由 . . . 44 #endregion //ReadOnly Section

You can check the read only section on the top of the namespace to see which objects are shared.

Sharing the internal application data can be extremely powerful since you will be able to rich not just information related to the report, but also to the interface. For example, you may have a report, which accepts parameter Employee ID from RT Report Manager interface and to add combobox, which will give the user easier way to insert the value.

📌 Employee	Sales List	
Presets 👻 Template	e <empty> - 🔚</empty>	
Employee	All	
Start Date	Name 📈	
	All	
End Date	Albert Hellstern	11
	Andrew Fuller	Щ
	Anne Dodsworth	
	Caroline Patterson	
	Janet Leverling	
Activity	Justin Brid	-
BuiltIn Administrator	×	.::

If you check parameter value it will be 1, since Employee ID is 1, but you may want to export the report to a file which name will contain the actual employee's name (Anne Dodsworth). The name will be available through the Parameter Additional Data property which will return the DataRow associated with the value in the list. Parameter prmEmployeeID = rtParameters["EmployeeID"];

```
if (prmEmployeeID.AdditionalData != null && prmEmployeeID.AdditionalData is System.Data.DataRow) {
   System.Data.DataRow dr = prmEmployeeID.AdditionalData as System.Data.DataRow;
   value = dr[1].ToString();
}
```

Please contact us at support@r-tag.com if you need help with C# functions.