Section 7

Using Formulas

Vision33
TOTAL CARE⁺
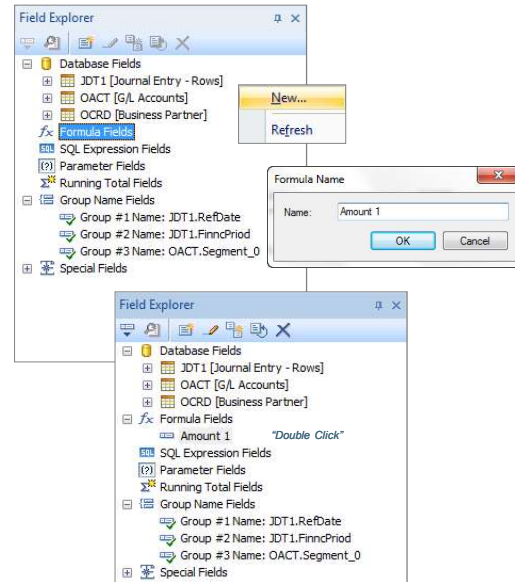
- **Sometimes, you need to add data on the report that does not exist in any of the data fields. In others you need to change the processing or presentation.**

- **In such cases, you need to create one or more formulas**

- **For example, to calculate the number of days it takes to process each order, you need a formula that determines the number of days between the order date and the ship date.**

- **Some Typical Uses of Formulas**
  - Creating calculated fields to add to your report
  - Selecting the right data for your report
  - Formatting fields, sections or groups on a report
  - Manipulating Text strings
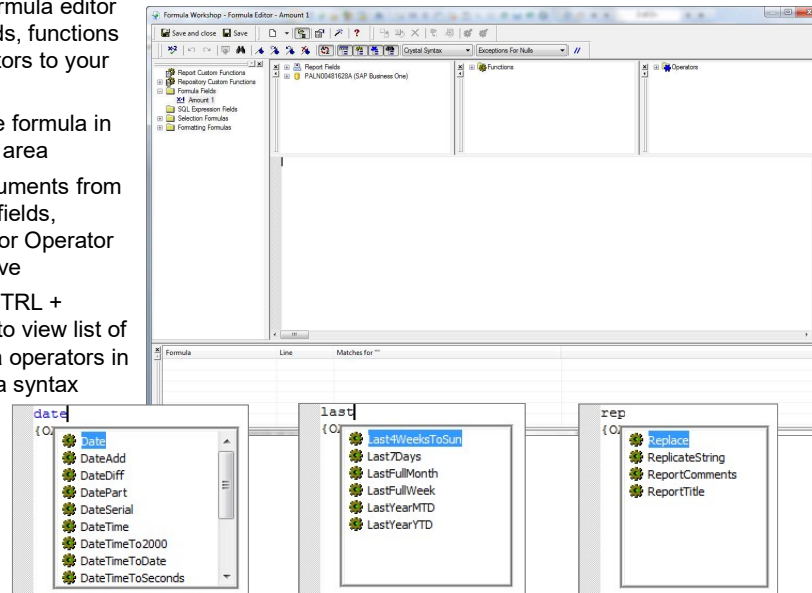 - Extracting parts of a date
  - Using a custom function

Functions
- Additional Functions
- Alerts
- Arrays
- Date and Time
- Date Ranges
- Document Properties
- Evaluation Time
- Financial
- Math
- Print State
- Programming Shortcuts
- Ranges
- Strings
- Summary
- Type Conversion
- Variable Constants
- Xcelsius

Operators
- Arithmetic
- Arrays
- Boolean
- Comparisons
- Control Structures
- Conversion
- Other
- Pattern
- Ranges
- Scope
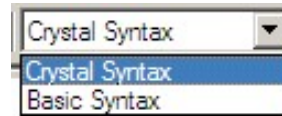- Strings
- Variable Declarations

- The Formula Field tree in the Field Explorer lists all formulas defined in the report:

- Right click on Formula Fields and select "New" to create a formula

- If formula fields exists, double click on the name to start the Formula Editor

- Other toolbar Experts will also create formulas in your report
  - Using the Select Expert will add a formula on the Selection Formula tree
  - Using formula to conditionally format fields, will add a formula on the Formatting Formulas tree

The Formula Editor

- Use the formula editor to add fields, functions and operators to your formula:
- Type in the formula in the syntax area
- Select arguments from the report fields, Functions or Operator boxes above
- Hold the CTRL + Spacebar to view list of functions a operators in the formula syntax

- Use the formula editor to add fields, functions and operators to the formula.
- You can use fields from the report, including other formulas, parameters, totals and more, or fields from the database
- You can also simply type in the formula manually in the formula syntax area.
- Hold down the CTRL key, and press the spacebar to open a full list of functions and operators

■ **You can create formulas using Crystal or Visual Basic syntax:**

```
Crystal Syntax        ▼
Crystal Syntax
Basic Syntax
```

■ **Most formulas can be written in both languages**

■ **No affect on performances**

■ **Syntax is not case sensitive**

■ **Record selection and group selection formulas cannot be written in Basic syntax**

■ **If your not a VB Programmer use the default Crystal Syntax**

Fields Syntax In Formula

Vision33
TOTAL CARE

- **Distinguishing Field Types in formulas**
  - Database   - {OINV.CardCode}
  - Parameters   - {?Select Period Range}
  - Formula   - {@another formula}
  - Running Totals   - {#RunningTotal)
  - Strings   - "Hello"
  - Comments   - //
  - Array or Subscript - [ ]
  - Function Argument - RIGHT(OINV.DocDate,4)

```
if {OPOR.CurSource} = 'L'
then {OPOR.DocTotal}
else if {OPOR.CurSource} = 'S'
then {OPOR.DocTotalSy}
else if {OPOR.CurSource} = 'C'
then {OPOR.DocTotalFC}
```

```
Mid ({OADM.CompnyName},1,5 )
```

```
{@TotalInvoiceAmount} - {@TotalTaxAmount}
```

```
{OPOR.DocEntry} = {?DocKey@}
```

```
Shared NumberVar carryTotal;
Shared BooleanVar lastMet;
if ({TmSp_DocLineTypeLayout;1.LineType} = 'R') Then
  carryTotal := carryTotal + {@LineTotal};

if OnLastRecord Then
  lastMet := TRUE;
```
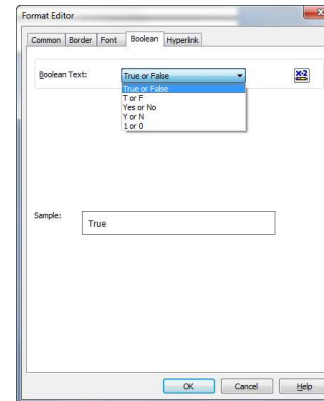
```
if {OADM.CurOnRight} = "Y" then " " + {POR1.Currency}
else
    {POR1.Currency} + " "
```

Boolean Formulas

- A Boolean formula returns a true or false value
- Common operators used in Boolean formula:
  - <>
  - And
  - Not
  - Or…

Example: You want to suppress all closed lines in a sales order:

- {RDR1.LineStatus} <> C
- Choose the output of the formula on the field format:

If-Then-Else Formulas

- **It enables you to evaluate a sequence of statements if a condition is true and evaluate a different sequence of statements if it is not true**

- **Example**
  - Print the customer balance on invoice form if it's greater then 0, otherwise don't print
    - IF {OCRD.Balance}> 0 then ToText ({OCRD.Balance}) else " "
    - IF {OCRD.Balance}> 0 then {OCRD.Balance} else 0   (The data type of Then and Else must be the same)

- **Other Business One Examples**

```
if {ORDR.CurSource} = 'L' then
    {ORDR.DocTotal}
else if {ORDR.CurSource} = 'S' then
    {ORDR.DocTotalSy}
else if {ORDR.CurSource} = 'C' then
    {ORDR.DocTotalFC}
```

```
If "Month" in {@DateFormat} then crLongYear
else if "CC" in {@DateFormat} then crLongYear
else crShortYear
```

```
If {ORDR.PartSupply}='Y' Then
    {@_AllowParital}
Else
    ''
```

```
If {TmSp_DocLineTypeLayout;1.LineType} = 'R' Then
(
    If {ADP1.VndrNum} = 'Y' Then 'Mfr No.:'
    Else 'Item Code:'
)
```

75

- **Over 50 Date and Time functions built-in to Crystal**
  - Date and Times
  - Date Ranges
- **Examples**
  - Addition/Subtraction of dates:
    - {ORDR.DocDate} + 15
    - ORDR.DocDate} - {CurrentDate}
  - Document Date math :
    - {OINV.DocDueDate} - {ORCT.DocDate}
  - Extract the Year/Month/Day value from date field.
    - Year({OINV.DocDate})
    - Month({OINV.DocDate})
    - Day({OINV.DocDate})

```
Date and Time
  CurrentDate
  CurrentDateTime
  CurrentTime
  Date
  DateAdd (intervalType, nIntervals, startDateTime)
  DateDiff
  DatePart
  DateSerial (year, month, day)
  DateTime
  DateTimeValue
  DateValue
  Day (x)
  DayOfWeek
  First Day of Week Constants
  First Week of Year Constants
  Hour (x)
  IsDate (string or number)
  IsDateTime (string or number)
  IsTime (string or number)
  Minute (x)
  Month (x)
  MonthName
  Second (x)
  ShiftDateTime (inputDateTime, inputTimeZone, out
  Time
  Timer
  TimeSerial (hour, minute, second)
  TimeValue
  WeekdayName
  Year (x)
Date Ranges
Document Properties
Evaluation Time
Financial
```

76

- **DateDiff – to calculate the difference between 2 dates:**

- **DateDiff (IntervalType, StartDate, EndDate)**

intervalType Value	Description
yyyy	Year
q	Quarter (3 month period)
m	Month
y	Day of Year
d	Day
w	Weekday
ww	Week (7-day period)
h	Hour
n	Minute
s	Second

- **DateDiff ('d', {OINV.DocDueDate}, {ORCT.DocDate})**

```
If {@DateFormat} in ["DD/MM/YY","DD/MM/CCYY","DD/Month/YYYY"]
then crDayMonthYear
else if {@DateFormat} in ["MM/DD/YY","MM/DD/CCYY"] then crMonthDayYear
else if {@DateFormat} in ["CCYY/MM/DD","YY/MM/DD"] then crYearMonthDay
```

```
select {OADM.DateFormat}
    case "0":
        "DD/MM/YY"
    case "1":
        "DD/MM/CCYY"
    case "2":
        "MM/DD/YY"
    case "3":
        "MM/DD/CCYY"
    case "4":
        "CCYY/MM/DD"
    case "5":
        "DD/Month/YYYY"
    case "6":
        "YY/MM/DD"
    default:
        "";
```

Arithmetic Formulas

- **Arithmetic**

  ⊟ Arithmetic
      Add (x + y)
      Divide (x / y)
      Exponentiate (x ^ y)
      Integer divide (x \ y)
      Modulus (x mod y)
      Multiply (x * y)
      Negate (-x)
      Percent (x % y)
      Subtract (x - y)

- **Sum – Total a numeric or currency value**
  - Sum ({OINV,DocTotal), or Sum ({OINV.DocTotal}, {OSLP.SlpName})

- **Count - Count the number of customers in each group:**
  - Count ({OCRD.CardCode}, {OCRD.GroupCode})

- **Distinct count – Count distinct records. For example number of distinct customers in a sales report :**
  - DistinctCount ({OINV.CardCode})

String Formulas

- **Concatenation:**
    - Use the '&' to concatenate two values of different data type
    - Use '+' to concatenate 2 string values
    - Examples:
        - "The products will be shipped on: " & {ORDR.DocDueDate}
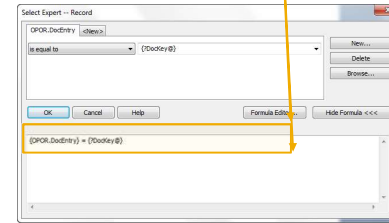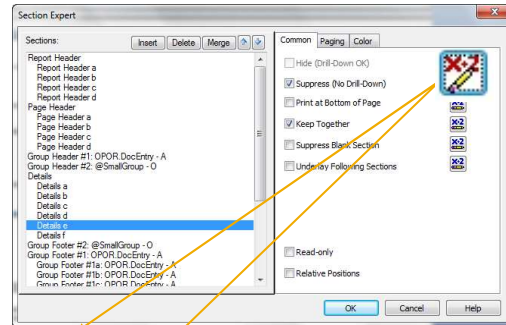   - "Customer Name " + {OCRD.CardName}

- **Text Case Functions**
    - UpperCase ({OCRD.CardCode})
    - LowerCase ({OCRD.CardName})
    - Propercase ({OCRD.CardName})

- **Right- Returns X number of characters from the right:**
  - Right ({OCRD.CRCardNum},4)

- **Left - Return X number of characters from the Left:**
  - Left ({OCRD.Phone1},3)

- **Length – returns the number of characters in the string, including spaces**
  - Length({OCRD.CardName})

- **Trim – Removing leading or trailing spaces from a string**
  - Trim ({OCRD.CardName})

- **InStr – Returns the position of the first occurrence of a string**
  - InStr ({ORDR.Address}," " ,1)

- **Mid – Return X number of characters starting the position identified:**
  - Mid ({ORDR.Address},InStr ({ORDR.Address}," " ,1) + 1)

Other Places Formulas Live

- **Selection Criteria (Group, Record)**

- **Field and Section Formatting**


```
{OPOR.DocType}  = 'S' or {TmSp_DocLineTypeLayout;1.LineType} <> 'T'
```

Vision33+
TOTAL CARE

Format Field...
Format Painter

Order Subtotal: Pm-#Invoice Sub

Discount Subtotal: {?Pm-@DiscountTotal

Down Payment: ?Pm-@DownPayment

Additional Expenses:

Rounding:

Total Before Tax:

Total Tax Amount:

Total Amount:

Format Editor

Common | Border | Font | Number | Hyperlink

Style

System Default Number Format
-1,123.00
-1123
-1,123
-1123.00
-1123.0000
-1,123.0000
(1123)
(1,123)
(1123.00)
(1,123.00)
(1123.0000)
(1,123.0000)
Custom Style

Currency symbol (system default):

☑ Display Currency Symbol
  ○ Fixed
  ◉ Floating

Customize...

Sample:
              $-55,555.5555555556

OK   Cancel   Help

Custom Style

Currency Symbol | Number

☑ Enable Currency Symbol
  ○ Fixed   ◉ Floating
☐ One Symbol Per Page
Position: $-123 ▾
Currency Symbol: $

Sample:
              $-55,555.5555555556

OK   Cancel   Help

{?Pm-@Doc. Currency Code}

Exercise 4

Basic Formulas

XL Reporter Workshop

83