

LABNAF DATE-TIME SERIES

TIME SERIES: DEFINITION FROM OXFORD LANGUAGES

“A time series is a series of values of a quantity obtained at successive times, often with equal intervals between them.”

LABNAF DATE SERIES FORMAT

Labnaf Date Series tagged value format is:

YYYY-MM-DD=NumericValue; YYYY-MM-DD=NumericValue; ...

Example: History of the number of incidents for each application

Application.Nb_Incidents_History = list of dates and values, for example , "2022-01-01=2;2022-02-01=3;2022-03-01=1"

IMPORTING DATE SERIES

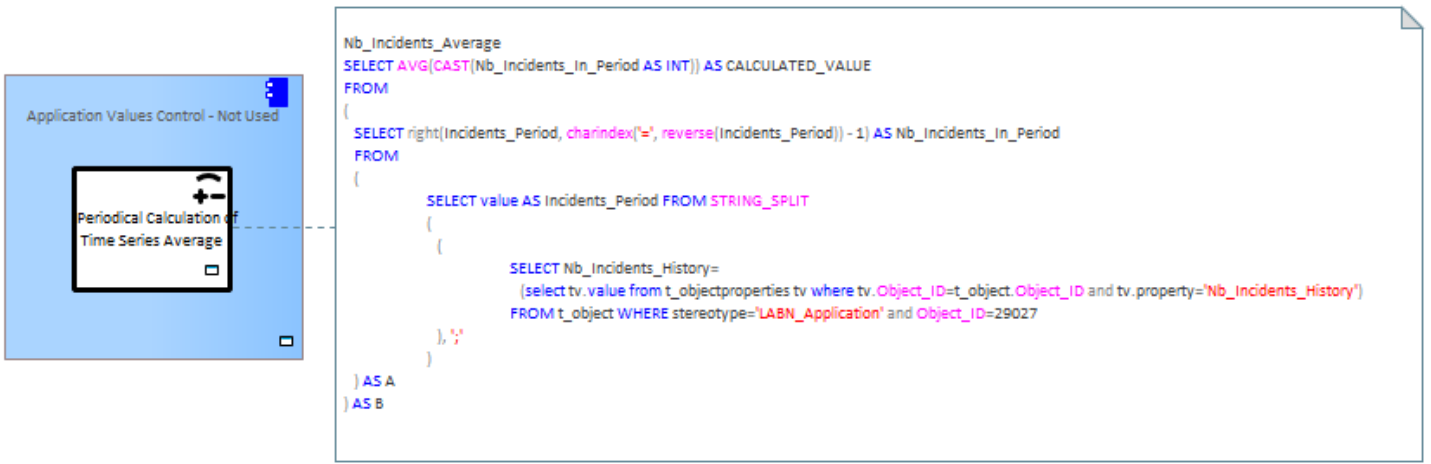
Periodic import of date series, for example Application.Nb_Incidents_History

Guid	Name	Nb_Incidents_History
{3F9A5A7C-60C5-4e38-B107-F7BB64C1DAC6}	Active Directory	2022-01-01=2;2022-02-01=3;2022-03-01=1
{0AA3AC8A-C0C6-431a-AFB9-41B6EFC23963}	Aphrodite Digimarketing	2022-01-01=9;2022-02-01=5;2022-03-01=6
{5B0A6CBE-AD19-43a2-A142-F0974464E0A9}	Ares	2022-01-01=8;2022-02-01=3;2022-03-01=5
{78169A07-6AE7-48a9-A2A7-FB048F78F998}	Athena Order Management	2022-01-01=3;2022-02-01=4;2022-03-01=7
D67EC76A-23D7-4512-82C9-E5B2ED50A8C2}	Bellona ESB	2022-01-01=5;2022-02-01=5;2022-03-01=5
.DBD00442-060D-41bc-8871-121BD3B84B3B}	BOPCO Journey Planner	2022-01-01=15;2022-02-01=12;2022-03-01=10
{BF4ECA19-66B0-46a0-A862-5887B1D85A4C}	BOPCO Travel Info	2022-01-01=6;2022-02-01=3;2022-03-01=1
{3908BC63-B69A-4edb-B29B-81D1344168FC}	CMDB	2022-01-01=4;2022-02-01=4;2022-03-01=6

CALCULATIONS BASED ON A SINGLE DATE SERIES

Example

Application.Nb_Incidents_Average = average calculated from the history field



The image shows a screenshot of a software interface on the left and a corresponding SQL query on the right. The interface window is titled "Application Values Control - Not Used" and contains a sub-window titled "Periodical Calculation of Time Series Average". The SQL query is as follows:

```
Nb_Incidents_Average
SELECT AVG(CAST(Nb_Incidents_In_Period AS INT)) AS CALCULATED_VALUE
FROM
(
  SELECT right(Incidents_Period, charindex('-', reverse(Incidents_Period)) - 1) AS Nb_Incidents_In_Period
  FROM
  (
    SELECT value AS Incidents_Period FROM STRING_SPLIT
    (
      SELECT Nb_Incidents_History=
      (select tv.value from t_objectproperties tv where tv.Object_ID=t_object.Object_ID and tv.property='Nb_Incidents_History')
      FROM t_object WHERE stereotype='LABN_Application' and Object_ID=29027
    ), ','
  ) AS A
) AS B
```

CALCULATIONS BASED ON MULTIPLE DATE SERIES (DATE SERIES CONSOLIDATIONS)

Multiple date series can be consolidated.

CONFIGURATION BY THE LABNAF CALCULATION ADMINISTRATOR

In the calculated field Notes, the calculation is not expressed in SQL but using one of the following expressions:

SumValuesInMatchingDateSeries { SQL returning a list of DateSeries fields from different elements to be consolidated }

AverageValuesInMatchingDateSeries { SQL returning a list of DateSeries fields from different elements to be consolidated }

Where the calculated Date Series fields format is: YYYY-MM-DD=NumericValue; YYYY-MM-DD=NumericValue; ...

So, for each level of enterprise functions we can cascade date series consolidations as follows:

- **FunctionalBlockPrototype.PeriodicalCalculation.Nb_Incidents_History.Notes** = **SumValuesInMatchingDateSeries** {SQL}
- **FunctionalAreaPrototype.PeriodicalCalculation.Nb_Incidents_History.Notes** = **SumValuesInMatchingDateSeries** {SQL}
- **FunctionalDomainPrototype.PeriodicalCalculation.Nb_Incidents_History.Notes** = **SumValuesInMatchingDateSeries** {SQL}

DATE SERIES CONSOLIDATION RULES

Empty date/time series are ignored (elements with an empty or missing date/time series field are ignored).

EXCLUSIVE OPTIONS (SELECT ONLY ONE OF)

- Discard incomplete date/time series when at least one date/time is missing
- Discard date/time from all series where it is missing at least once

- Consolidate values even when some dates/times and values are missing in some date/time series

EXAMPLE

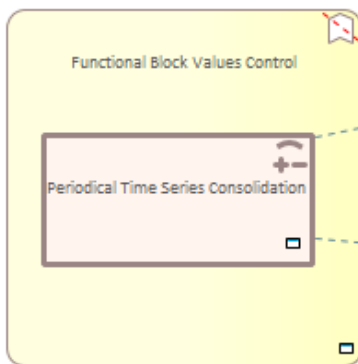
Application date series, like the history of the number of incidents, can be consolidated into enterprise function (business capabilities) date series i.e. for the enterprise functions realized by these applications, up to the top-level enterprise function (Functional Domain / FD).

FD, FA, FB.Nb_Incidents_History = consolidated Nb_Incidents_History from realizing applications or from Children FB or FA

SOURCE ELEMENT VALUE

Application.Nb_Incidents_History = 2022-01-01=2;2022-01-02=3;2022-01-03=1

CONSOLIDATION CALCULATION



TimeSeries_OnMissingValue = Discard This Date/Time For This Element;
Values: Discard This Date/Time For This Element, Discard This Date/Time For All Elements, Discard All Dates/Times For This Element
Default: Discard This Date/Time For This Element

```
Nb_Incidents_History
SumValuesInMatchingDateSeries
SELECT oApp.Name as AppName, prop.value AS CALCULATED_VALUE /* Direct realization of any type of EF by applications */
FROM t_object oApp LEFT JOIN t_objectproperties prop ON oApp.object_id = prop.object_id
WHERE oApp.Stereotype = 'LABN_Application'
AND oApp.Object_ID IN
(SELECT Start_Object_ID FROM t_connector
WHERE t_Connector.Stereotype = 'LABN_Realization'
AND t_connector.End_Object_ID = #CurrentElementID#)
AND prop.Property='Nb_Incidents_History'
```

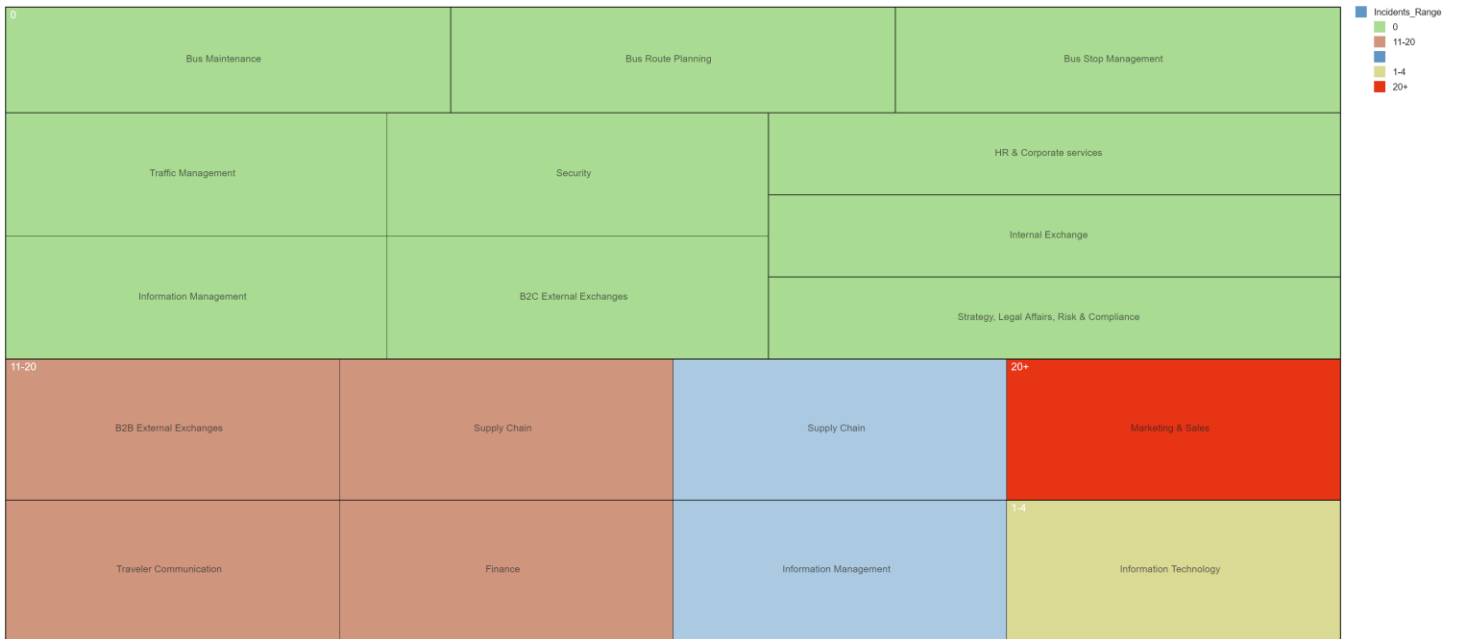
DATE SERIES VISUALIZATION

CHARTS AN HEAT MAPS

We can calculate and then visualize current and average values from a date series using colored charts, reports and heat maps.

Heat maps can show, for example, colored enterprise functions according to the value.

Number of Application Incidents in Functional Domains



TIME SERIES GRAPHS (FUTURE)

Example

The following Labnaf Date Series: 2022-05-27=5698;2022-01-09=5796; 2022-06-16

Can be visualized using a graph as follows (blue line):

