Forecast Level Optimizer

Find the best forecast strategy

SAP Consulting
August 2011

Agenda

The challenge: A better forecast strategy

The solution: SAP's forecast level optimizer

Details to the forecast level optimizer

- Possibilities
- Data Input
- Output and analysis

The challenge: A new strategy to forecast

Current situation:

Forecasting by using „Demand planning interactive" or batch-job

Definition of characteristic value combinations

Choose of mathematical model:

- Manually or

- „Automatic Model Selection"

Manual choose of aggregation level

Problem:

- Finding the best mathematical method at manual choose

- „Automatic Model Selection" does not contain all available methods

- Is the used Planning Level (Aggregation level) for elements to forecast really the best one?
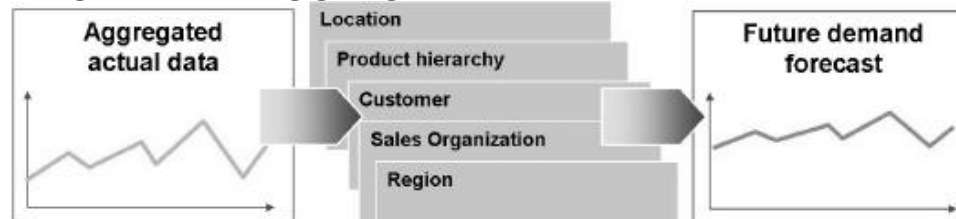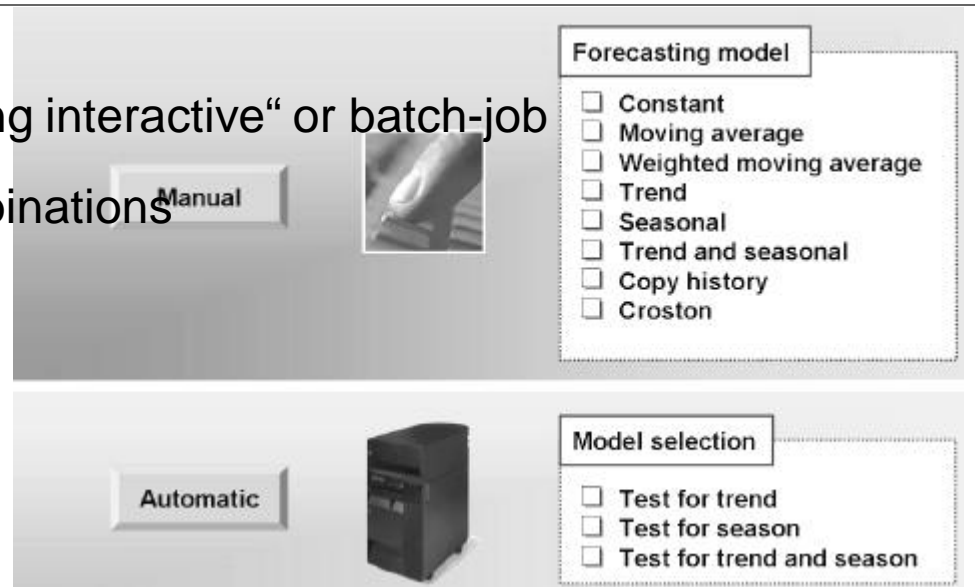
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The solution: SAP's forecastlevel optimizer

Questions and answers to SAP's forecastlevel optimizer

- **Which prerequisites must customers fulfil?**

  The use of SAP SCM with integrated APO

- **Which advantages offers the tool?**

  Calculation of the best forecast strategy comparing mathematic methods, smoothing parameters and aggregationlevel

  Shows analysis of result (e.g. 'How often is method XXX used')

  Shows following forecast errors for each characteristical combination of choosed aggregationslevel(s):
  - MAD, MAPE, MPE, MSE, RMSE

- **Is the forecastlevel optimizer a modification?**

  No. It is an Add-on, no modification.

- **Is Customizing necessary to use the tool?**

  No, customizing is not needed.

- **How time-consuming is the adoption?**

  The solution will be installed and available within one day.

- **What's the whole amount of costs for the forecastlevel optimizer?**

  Please send an inquiry to Marc Hoppe

Agenda

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- Possibilities
- Data Input
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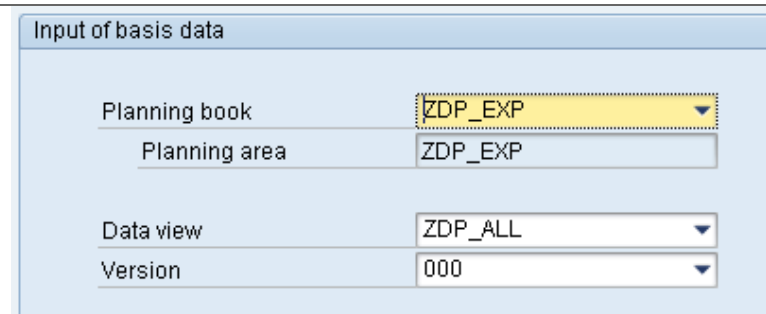# Details to SAP's forecastlevel optimizer

The first necessary step is the selection of a planning book, a data view and a planning version.

The next step is to choose basic data from planning area for forecast optimization:

On the first tab strip you enter:

➢ Range of history data

➢ Selection area

➢ History key figure

➢ „Aggregation target level"

The "Aggregation Target Level" is

the level on which your forecast later

will be executed, for example:

„Product".
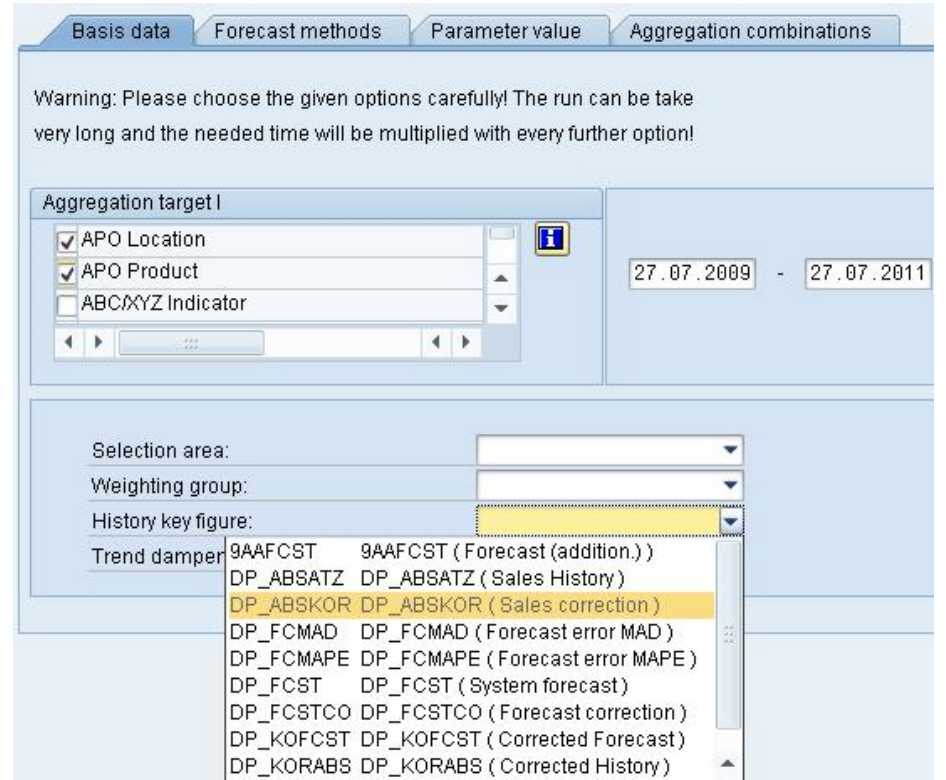
Input of basis data

Planning book	ZDP_EXP
Planning area	ZDP_EXP
Data view	ZDP_ALL
Version	000

Basis data / Forecast methods / Parameter value / Aggregation combinations

Warning: Please choose the given options carefully! The run can be take very long and the needed time will be multiplied with every further option!

Aggregation target I

✓ APO Location
✓ APO Product
☐ ABC/XYZ Indicator

27.07.2009 - 27.07.2011

Selection area:
Weighting group:
History key figure:
Trend damper

9AAFCST	9AAFCST (Forecast (addition.))
DP_ABSATZ	DP_ABSATZ (Sales History)
DP_ABSKOR	DP_ABSKOR (Sales correction)
DP_FCMAD	DP_FCMAD (Forecast error MAD)
DP_FCMAPE	DP_FCMAPE (Forecast error MAPE)
DP_FCST	DP_FCST (System forecast)
DP_FCSTCO	DP_FCSTCO (Forecast correction)
DP_KOFCST	DP_KOFCST (Corrected Forecast)
DP_KORABS	DP_KORABS (Corrected History)

Details to SAP's forecastlevel optimizer

In the next tab strip you can ente...

The forecast methods which should be used in the optimization run

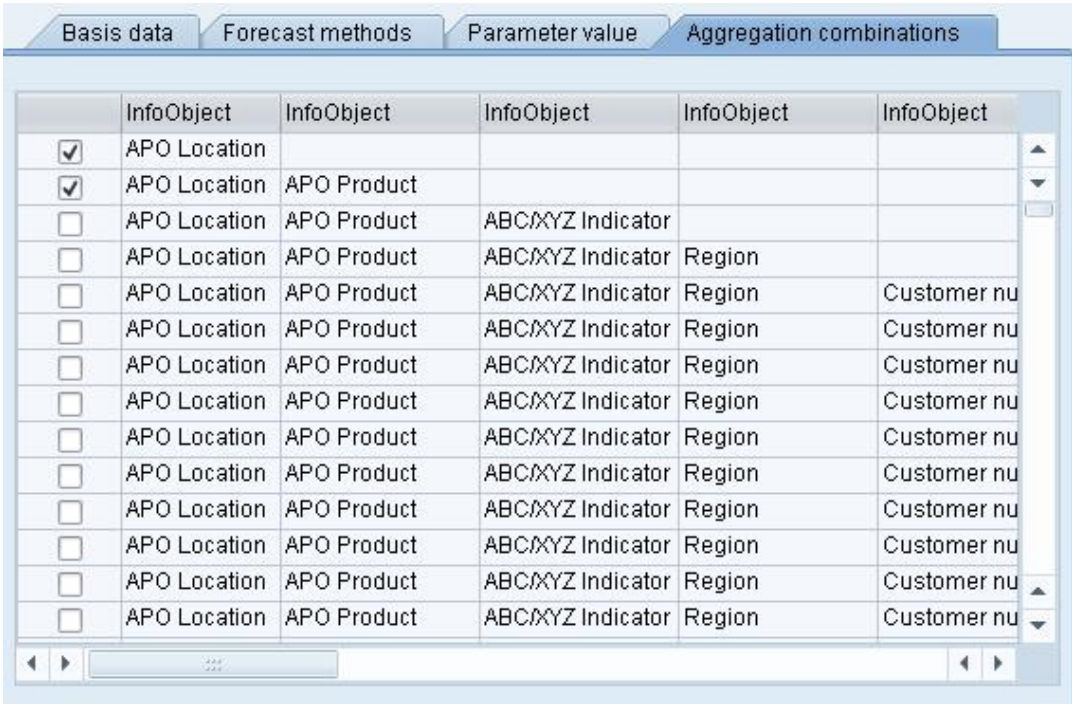- In tab strip 3 the smoothing parameters can be adjusted

Basis data	Forecast methods	Smoothing paramete	Aggregationlevel combinat

Constand models

- ☐ Median method
- ☐ Linear regression
- ☐ Floating average
- ☑ Constant modell. (exp. smoothing 1. grad
- ☐ Constand modell + alpha optimization (1.
- ☑ Floating average

Saison models

- ☐ Periode(Wochen) / Saison
- ☐ Saisonal linear regression
- ☑ Saison of Winters

Trend models

- ☑ Exponential. smoothing 2. Grade
- ☐ Trendmodell
- ☐ Trendmodell + alpha optimization (2. Grd

Automatic models

- ☐ Automatic Modell Selection 1

Other models

- ☑ Saisonal trend model
- ☑ Croston's Modell

Basis data	Forecast methods	Parameter value	Aggregation combinations

Intervals for forecast methods

Alpha start value	0,30	Beta start value	0,30	Gamma start value	0,30
Alpha steps	0,10	Beta steps	0,10	Gamma steps	0,10
Alpha endvalue	0,50	Beta end value	0,50	Gamma endvalue	0,50

| Alpha2 | 0,10 |
| Sigma | 1,50 |

Other settings

- ☑ Consider same results

Details to SAP's forecastlevel optimizer

In the 4th tab strip you can choose all possible aggregation level
combinations from the planning area. The optimization tool will forecast all
CVC's from the chosen selection profile (in basic data). The tool will
generate a forecast on all chosen levels here. After, it will compare the
results for each CVC in all aggregation levels by aggregation /
disaggregation and will determine the level with the best results.

		InfoObject	InfoObject	InfoObject	InfoObject	InfoObject
☑		APO Location				
☑		APO Location	APO Product			
☐		APO Location	APO Product	ABC/XYZ Indicator		
☐		APO Location	APO Product	ABC/XYZ Indicator	Region	
☐		APO Location	APO Product	ABC/XYZ Indicator	Region	Customer nu
☐		APO Location	APO Product	ABC/XYZ Indicator	Region	Customer nu
☐		APO Location	APO Product	ABC/XYZ Indicator	Region	Customer nu
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☐		APO Location	APO Product	ABC/XYZ Indicator	Region	Customer nu
☐		APO Location	APO Product	ABC/XYZ Indicator	Region	Customer nu
☐		APO Location	APO Product	ABC/XYZ Indicator	Region	Customer nu
☐		APO Location	APO Product	ABC/XYZ Indicator	Region	Customer nu
☐		APO Location	APO Product	ABC/XYZ Indicator	Region	Customer nu

Tabs: Basis data | Forecast methods | Parameter value | Aggregation combinations

Forecast level optimizer:
Idea: Forecast on different levels:

Execution aggregation level

		Run 1	Run 2	Run 3

Country — GER

Product group — A

Product — 1 2 3

Forecast GER

Disaggregation

Forecast 1 for A

Forecast for A

Forecast 2 for A

Forecast 3 for A

Aggregation

Forecast for 1, 2 und 3

Target aggregation level

Details to SAP's forecastlevel optimizer

Start calculation... Profile: 1 of 6 ; Agg-Level-Combi: 1 of 2
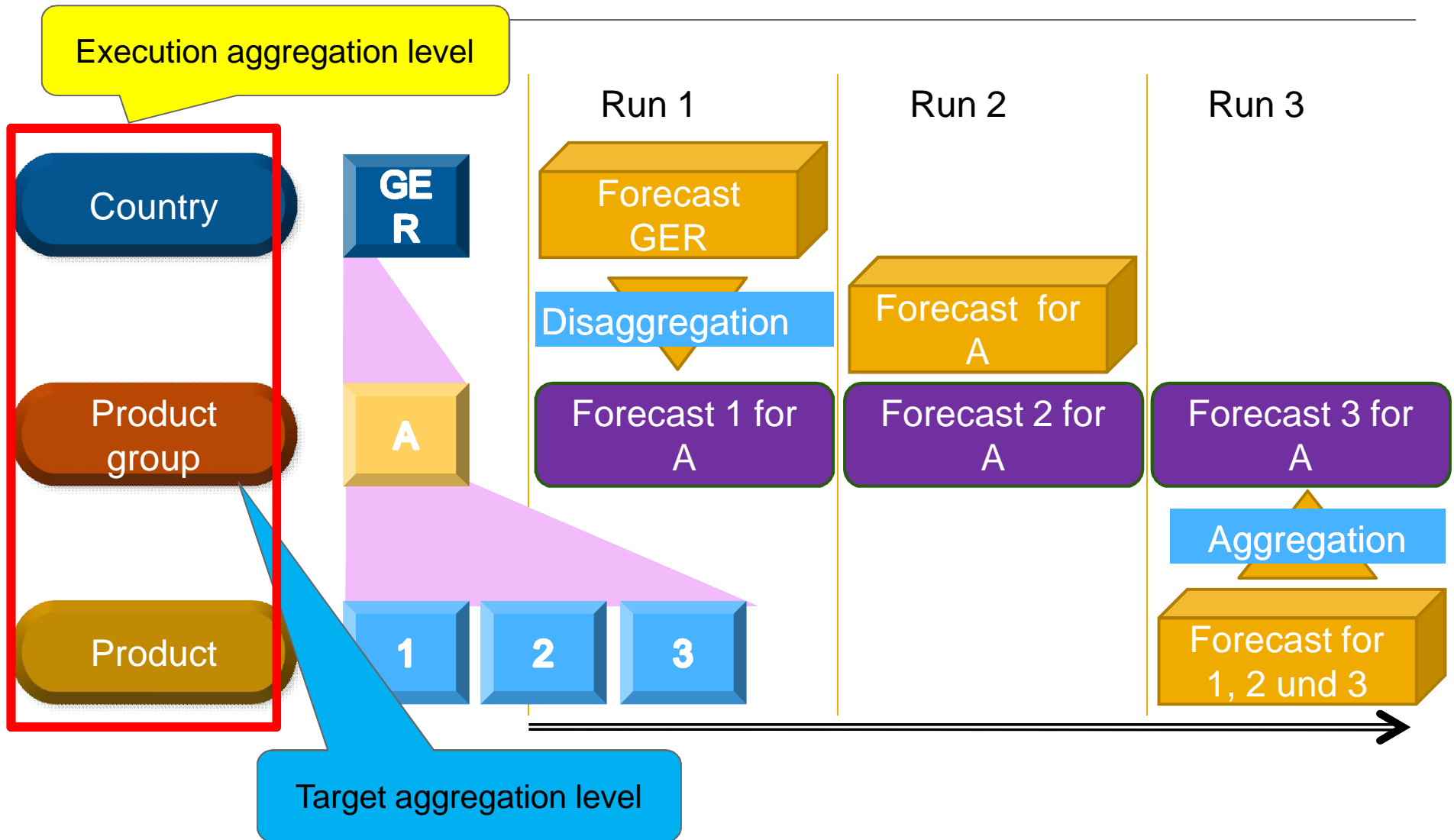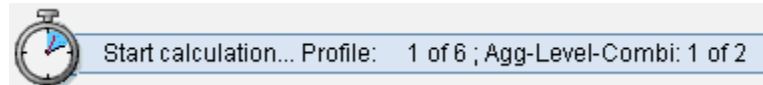
- After the confirmation the calculation of forecasts follows. The tool uses for the forecast **all choosed forecast methods** with a variation of **all smoothing parameters** in **all choosed combinations of aggregation levels**. Following forecast errors will be calculated:

  ✓ Error amount

  ✓ MAD,

  ✓ MPE,

  ✓ MSE,

  ✓ RMSE and

  ✓ MAPE

Details to SAP's forecastlevel optimizer

On the result view there are three tab strips. The first one displays only the entered data before the run like:

- Planning area

- Target aggregation level

- Time range of history

- Number of forecast runs

Details to SAP's forecastlevel optimizer

The second tab strip consists of a list of all CVC's of the chosen Target Aggregation Level and the chosen Selection Profile.

In this example the Target level: APO Location and

- APO Product.

With a click on one CVC a window opens which displays the individual recommendation for the forecast strategy:

- Forecast method

- Smoothing parameters

- Target aggregation level

Based on the chosen error-measure the result can change

Details to SAP's forecastlevel optimizer

The second tab strip on the popup-window is an information about the history values and the calculated expost-values with the best forecast strategy of the selected CVC.

Details to SAP's forecastlevel optimizer

Tab strip 3 offers a graphical mass-analysis about the forecast results. This analysis is also based on the error measure which can be selected in the drop-down box.

The graphic on the first sub-tab strip displays, how often the tool determined the best forecast on which aggregation level.
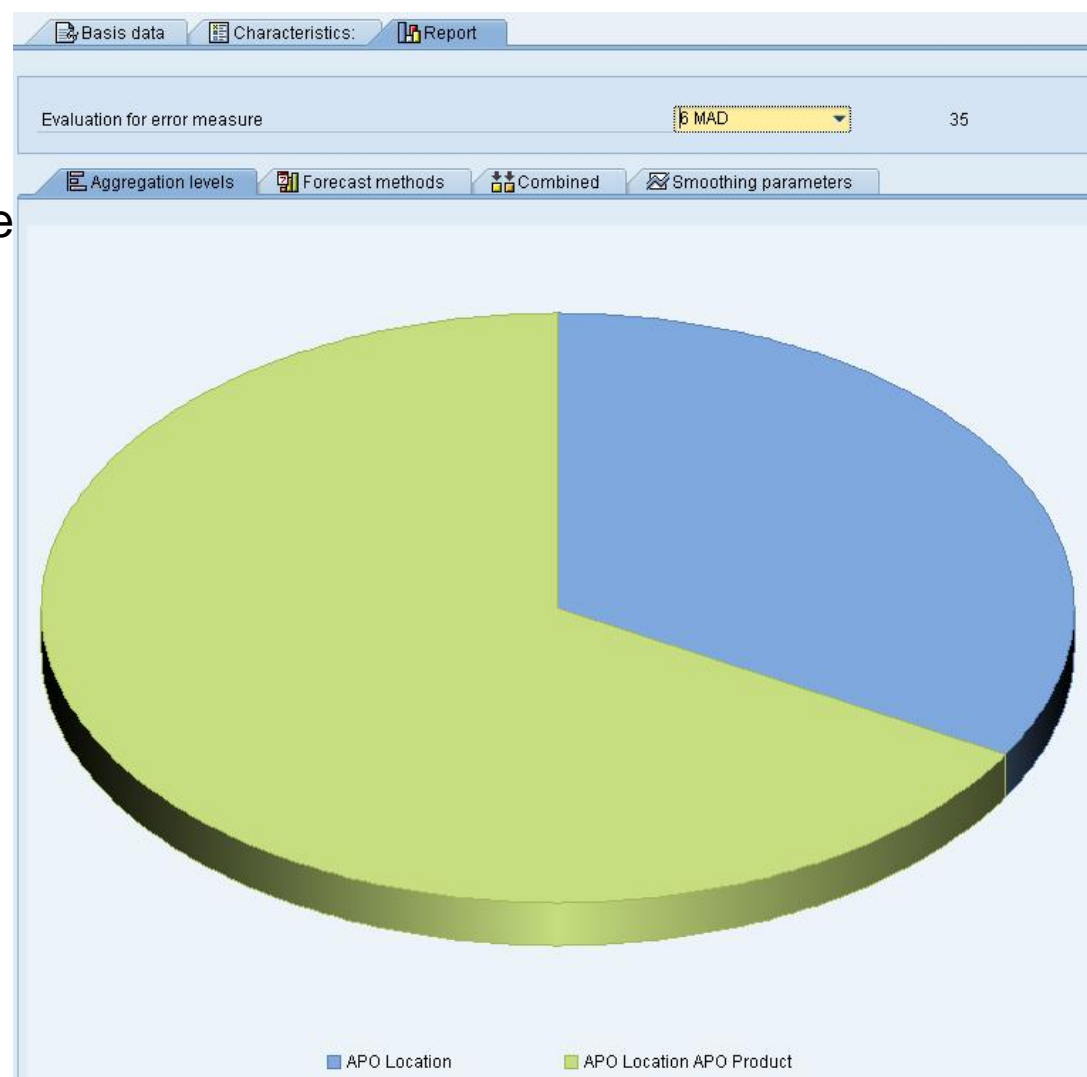
Details to SAP's forecastlevel optimizer

In the sub-tab-strip "Forecast methods" it is shown which forecast methods achieved the best forecast result for all CVC in the chosen selection profile.
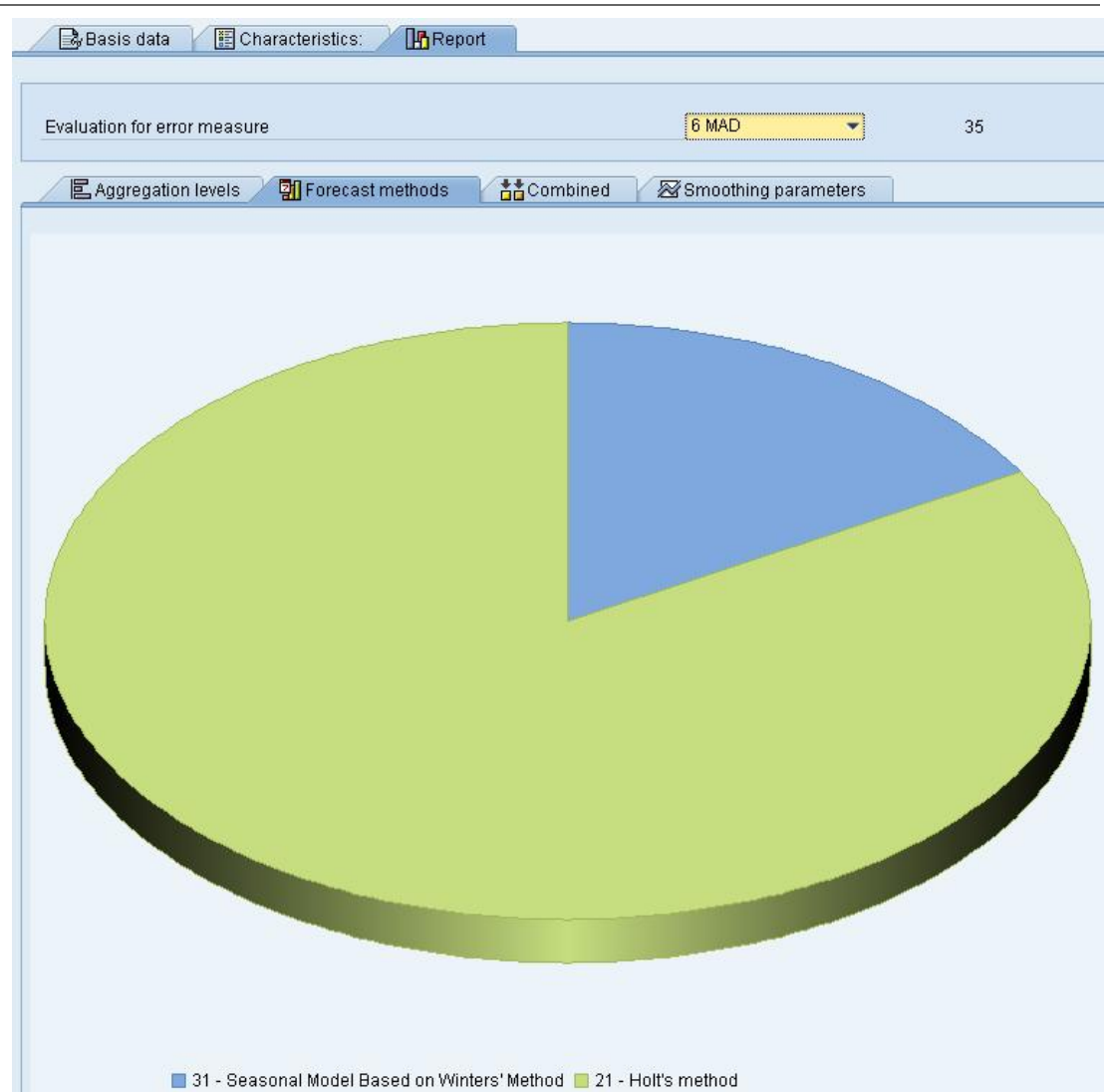
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The sub tab-strip "Combined" is a combined analysis if the first two:

- Aggregation levels
- Forecast Methods

It shows, which forecast method brought the best forecast results on which aggregation level.

This is important to find a complete forecast strategy and not a forecast method or an aggregation level only

Details to SAP's forecastlevel optimizer

The final tab-strip in analysis shows the used smoothing parameters for the forecast methods.

It makes sense, to have a look on this view first only, if you are clear about the forecast method and the aggregation level.

The information provided here can be used for fine-tuning.
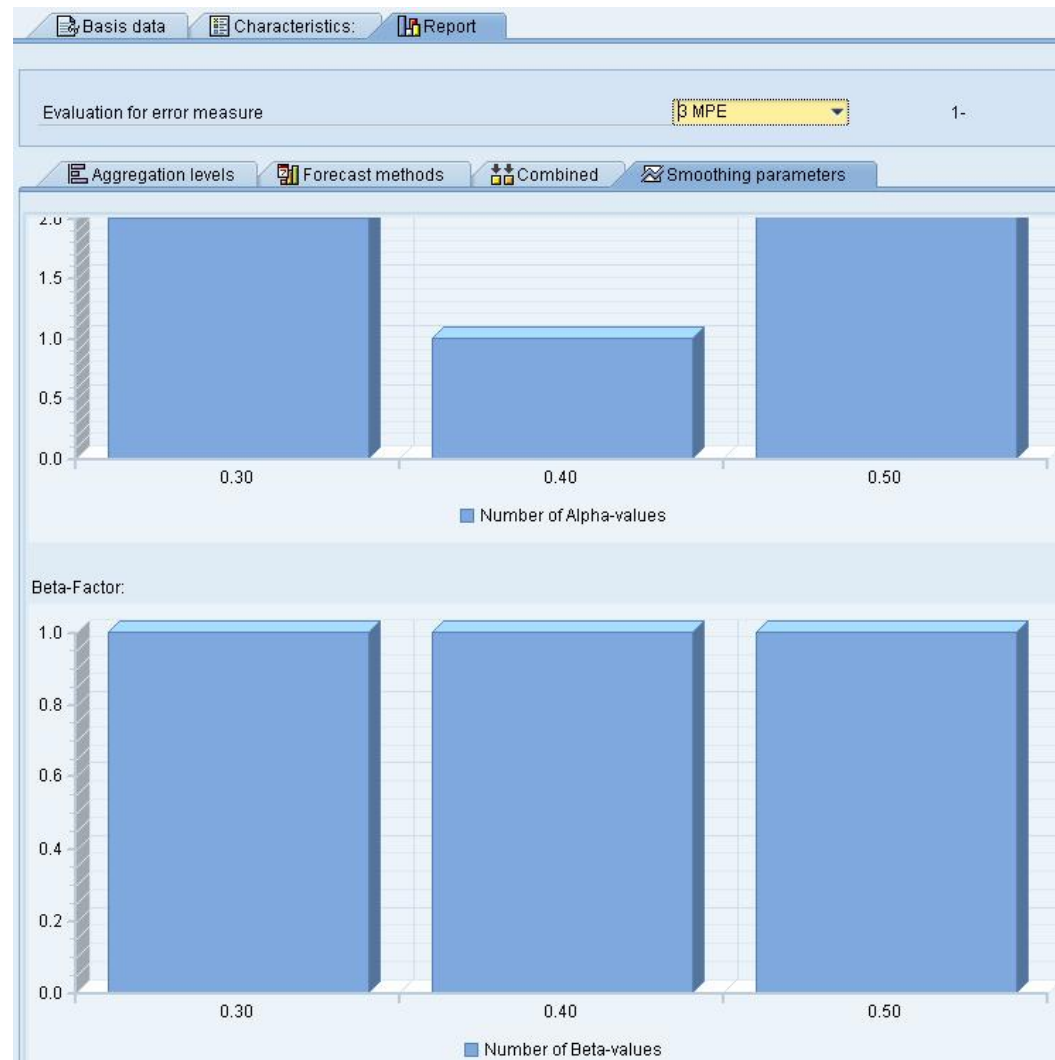
Thank You!

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