Forecasting in Service Parts Planning

Purpose
The purpose of this WIKI is to explain the forecasting in SPP-APO.

Overview
In this wiki you will have an overview of the forecasting in SPP-APO, explaining services, parameters and their functionalities.

Utility
- React flexibly to changed demands.
- Determine the best forecast model for a location product.
- Forecasting encompasses the whole life cycle of a product.
- High automation for mass processing of location products.
- Forecast planned includes the demand in the absolute number of pieces, forecast of the number of order items and a forecast of the average demand per order item.
- Allow to maintain parameters efficiently and at detailed level.
- Forecasting function in can be performed in the Planning Service Manager (PSM) or Interactive forecasting screen.

Forecast Profile
- Define, check, and change the control parameters for forecasting.
  E.g: Forecast strategy, periods, Parameters, indicators, factors and etc.
- Forecas Profile: /SAPAPO/SPPFCSTPRF

Forecast Run
- Forecast run can be performed via Planning Service Manager or Interactive Forecasting screen.
- Forecasting provides results at location product level.
- Allow manual corrections.
- Simulation version are available for this application.
- Allow maintain forecast profiles.

Planning Book for Forecasting: /SAPAPO/SPPFCST

Planning Service Manager: /SAPAPO/PE_RUN

Obs: Forecast run via Planning Service Manager is used for mass processing of location products, while the Interactive Forecasting screen is used in a test or simulation level. This second one allow the user make change interactively in the parameters and profiles during the runs

Forecast Strategies
Provide the method of forecasting. There are nine different types of forecast model for SPP:

1. First Order Exp. Smoothing (FOES): It is used for a constant forecast. common values for alpha in FOES is between 0.1-0.3. FOES is a constant value.

2. Second Order Exp. Smoothing (SOES,B1): It is FOES plus a term for the trend, that is smoothed by the beta factor.

3. Moving Average (C1): Is a simple model to determine a constant forecast, that is calculated as the average of the last periods of demand history

4. Linear Regression (D1): Extrapolates the demand history with a straight line using the method of the least squares. The number of historical periods to determine the straight line is maintained as “Periods for trend line” in the “model parameters” of the forecast profile.

5. Second trend model (E1): This model is similar to SOES, however it considers also the seasonal patterns. The seasonal patterns are modelled by the coefficient group that is assigned to the forecast profile.

This coefficient group is maintained in the SPRO -> Supply chain planning->SPP -> Forecasting-> Define seasonal coefficients. It contain seasonal indices for 12 periods, and it define the shape of the seasonality.

In order not to smooth these coefficients the gamma factor should be zero

6. Seasonal Trend Model with fixed Periods (F1):

It is the default mode for service parts with seasonal demand. At least 24 months of demand history are required for this forecast model. The seasonal coefficient are calculated as an average from past years. If there are more than 36 periods of demand history, the trend will be calculated by Weighted average. The annual weighing factor is defined in the forecast profile.
7. Intermittent Model (H1):

It is designed for sporadic demand. It calculates the demand quantity based on non-zero periods and the duration between the demand periods. Exponential Smoothing is used to calculate the duration between the demand periods.

8. Dynamic Moving Average (H1):

This is often used for slow-moving parts. This model uses the weekly forecast values. These values are available even if the periodicity for forecasting was set to month or posting periods.

9. Declining Demand:

It is used for the end of a service parts life cycle. When is necessary a constantly declining demand for a part. An Exponential curve is used for the future projection of the demand.

Prerequisites: The model that is there is a declining growth rate. The product must not be set as new product.

**Automatic Model Evaluation**

Automatic model evaluation consists of Tripp’s tracking signal

- Tripp’s tracking signal checks whether the forecast model is still optimal or whether there is a systematic forecasting error.
- Tripping reinitializes basic values and the deviation of an existing forecast model and shortens the demand history used for forecast creation.
- Schedule Trigg’s tracking signal and tripping separately in the forecast service.

**Automatic Model Selection**

- The forecast model is crucial for the quality of the forecast.
- The selection of forecast model is based on an analysis of the demand history, interactively or automated.
- Model selection to automatically determine the forecast model best suited to a specific location product.
- Can schedule it separately in the forecast service profile.
- It is also included in the combined forecast.

**Obs:** Combined forecast, when all services available for forecasting are run in the same time.

**Model Parameters**

**Standard deviation and the MAD**

- Measure the difference between forecast history and the demand history.
- Influence on the accuracy of information
- Based on past periods
- It is calculated for each product location.

Is an indicator for the difference between the historical forecast and the demand history, influence in the quality of the information. It is based on a number of past periods. It is defined in the “model parameter”-view of forecast profile.

For future periods the last standard deviation is applied and it is a constant value (except for seasonal trends).

This indicator uses the demand quantities, number of past order items and average demand per order item, forecast and disaggregated forecast.

The standard deviation is calculated with the mean average deviation (MAD) after performing the forecast.

**Alpha, Beta and Gamma**

- Are Smoothing factors to adjust the forecاستings
- This parameters influence directly in the trend, seasonality, model of the forecast planning’s.

**Rough-Tuning and Fine-Tuning**

- Used for forecast models that uses smoothing factors
- It is not included in the combined forecast
- It just can be setted or changed manually

**Forecast Approval**

- Save the final forecast for each location product
- Checks which forecast results require manual approval according to rules that you define
- Automatically approves all other forecast results
- Provides results to other SPP planning services.
• Performs forecast approval when you manually save the forecast results on the *Interactive Forecasting* screen

**Related Content**

**Forecasting**