APO: Characteristics Based Forecasting

Applies to:

SCM 5.0 APO Demand Planning. For more information, visit the Supply Chain Management homepage.

Summary

Characteristics-Based Forecasting (CBF) is a powerful tool that enables you to forecast demand on both the product and the characteristics level.In the Automobile and high-tech industries, different combinations are possible. Obviously, it is not practicable to forecast and track all of these combinations. Although there may be many possible combinations, not all of these combinations are possible or you do not want to produce several combinations. In characteristics-based forecasting, you can produce demand plans for combinations of characteristic values or for individual values. You generally restrict the characteristics used in CBF to those that are important for planning purposes. CBF is integrated with the SAP APO Production Planning/Detailed Scheduling component, and can be procured or produced individual components based on the characteristics-based forecast. This article explains the process of characteristic based forecasting and its purpose and configuration.

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Author Bio

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Table of Contents

Business Scenario: 3
Master Data in APO: 3
a) Create a Product: 3
b) Create Characteristics and Class 4
Planning object structure and planning area 6
a) Planning object structure: 6
b) Planning Area: 6
Settings for CBF in APO 7
a) Create CBF Table 7
b) Maintain the CBF profile and table to Product 8
c) Maintain Component oriented logic indicator 9
Demand Forecasting: 10
a) Characteristic Value Combinations: 10
b) Maintain Forecast Profile 11
c) Define Planning Book 12
d) Interactive Demand Planning 15
Related Content 17
Disclaimer and Liability Notice 18

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Business Scenario:

In this Business Scenario Car is taken as configurable product. It has characteristics Color, Transmission and Trim with different values. The scenario is to forecast the demand for the product (Car), but also for the characteristic combinations or individual characteristic values for example particular colors (White, Black etc.) or particular Trims (4 Cylinder, 6 Cylinder etc.,). You need to know how many engines of a particular size or doors in a particular color are required in future. In an ERP system or in SAP APO, these features (color, engine, and trim in the above example) are referred to as characteristics. The characteristic values are for instance the colors red, green, and blue or the individual engine sizes. Some of the combinations (6 Cylinder Engine and Manual Transmission) are excluded from the forecasting.

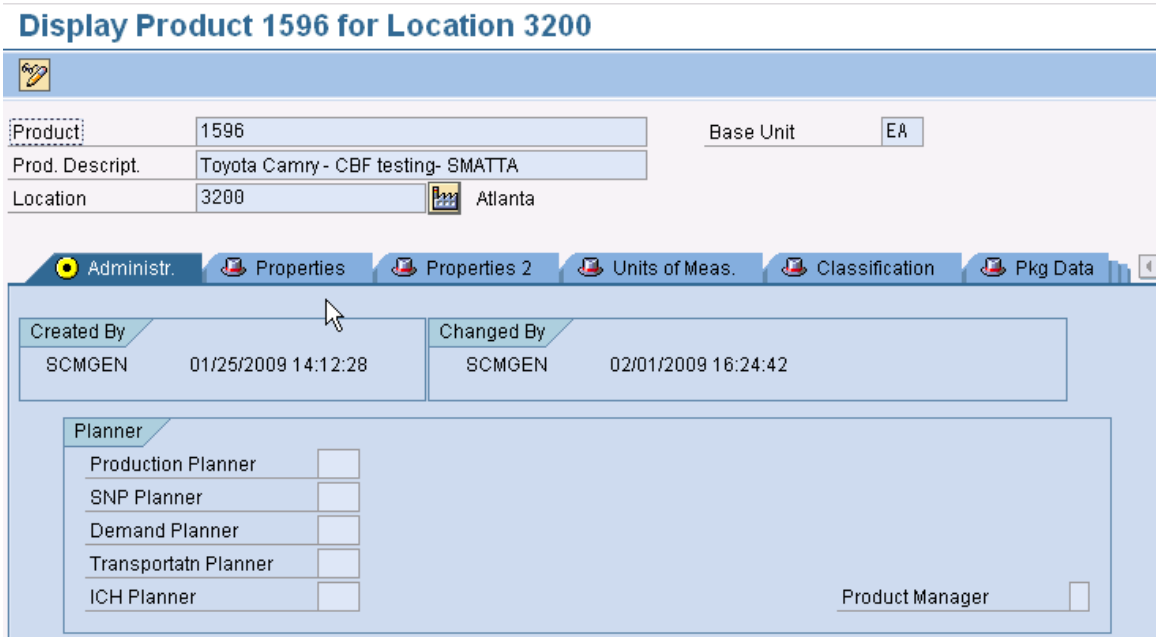
Master Data in APO:

Main master data for Characteristics based forecasting is Product, Class and characteristics.

a) Create a Product:

The product must have requirements strategy *30 Planning Without Final Assembly* (*Demand* tab page for the location product). This prevents production orders for the final product from being created, but generates dependent requirements for the components.

Transaction: /SAPAPO/MAT1 – Product



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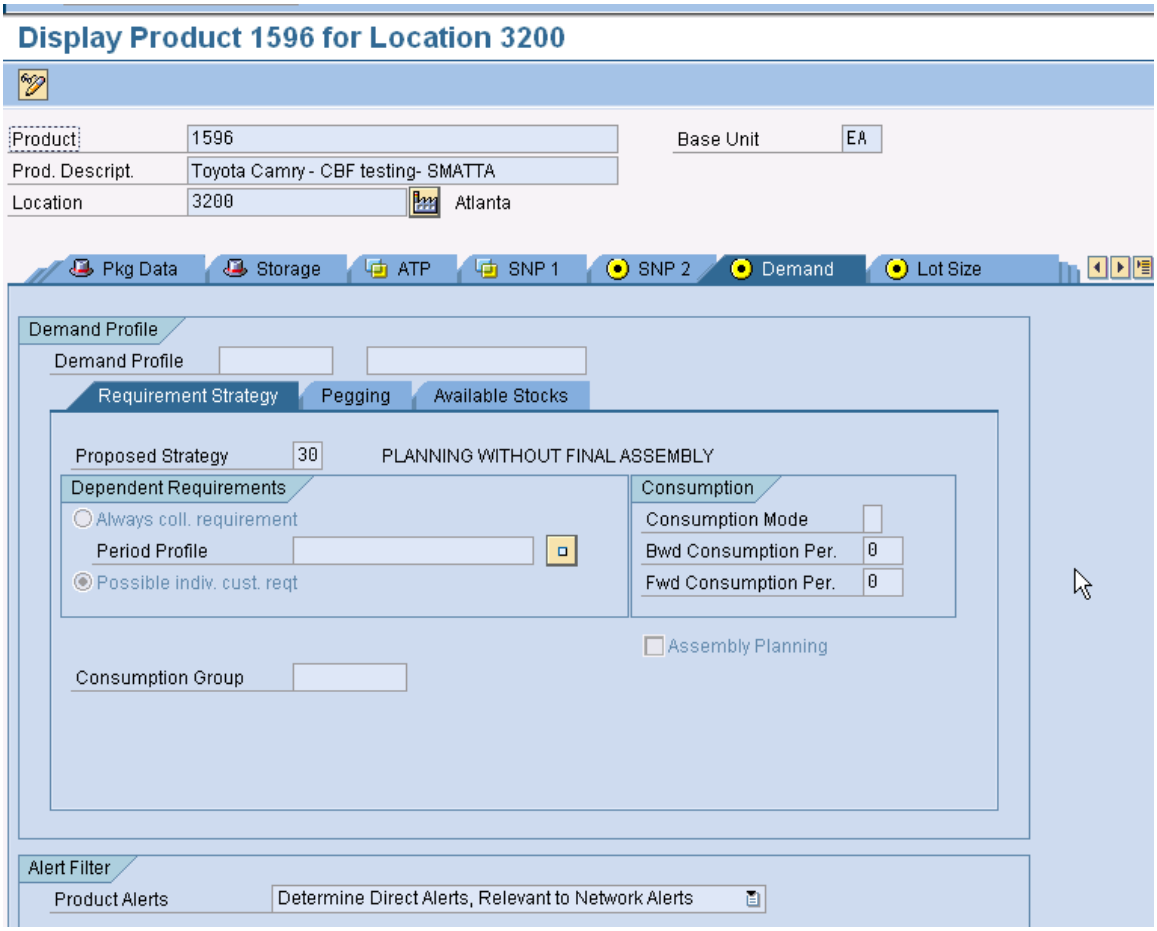
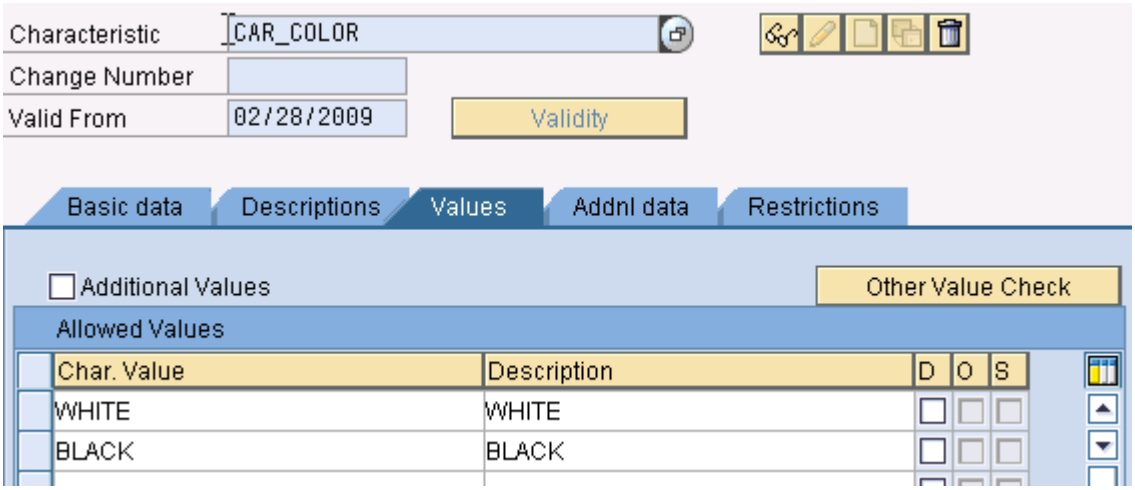


b) Create Characteristics and Class

Master Data → Classification System → CT04 – Characteristics

CAR_COLOR



CAR_TRANSMISSION

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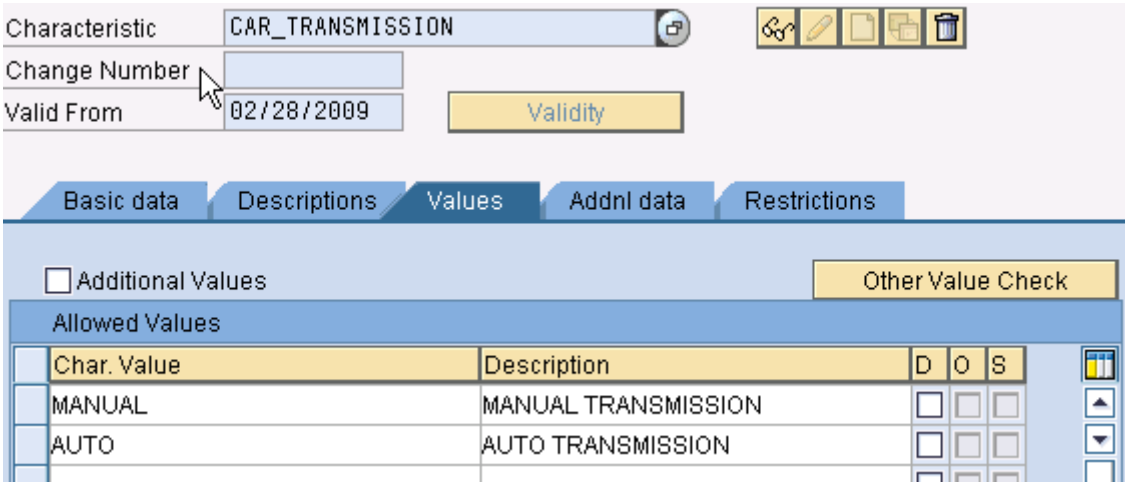
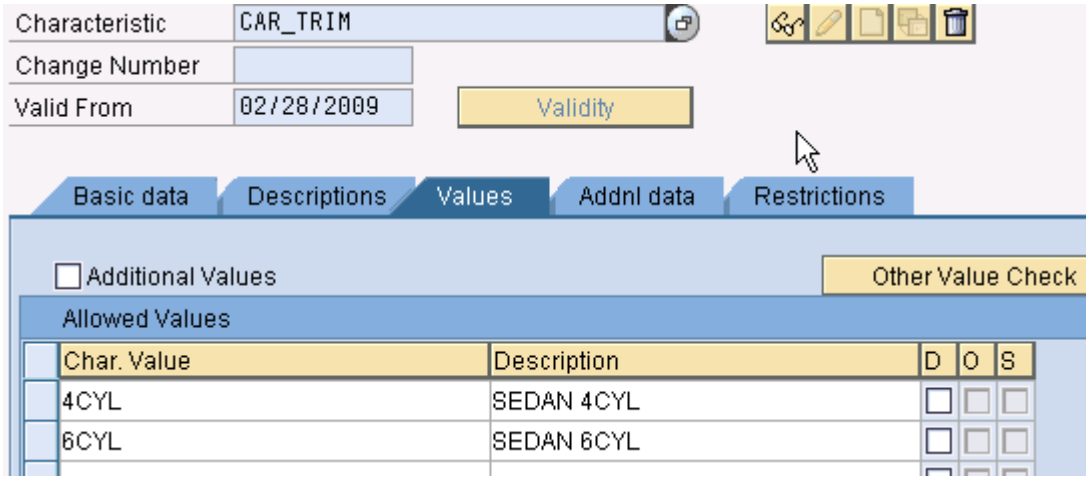
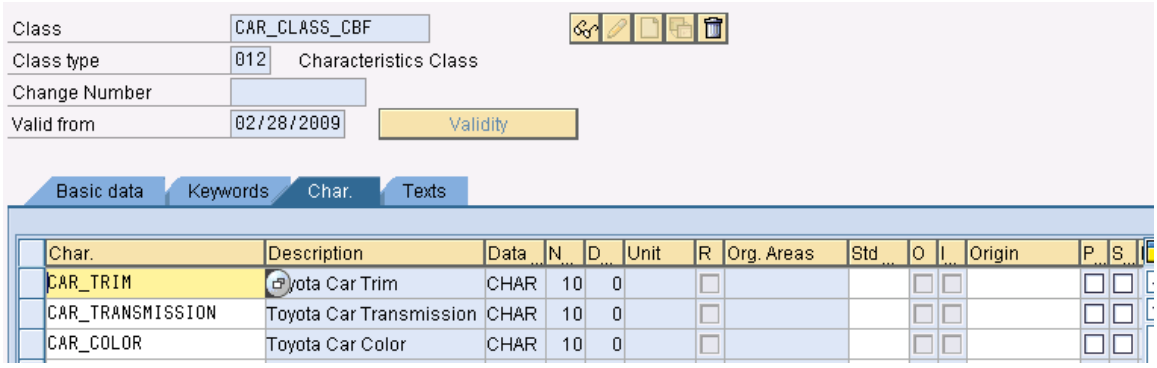


CAR_TRIM



Master Data → Classification System → CL02 – Classes

Assign existing characteristics to the class



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Planning object structure and planning area

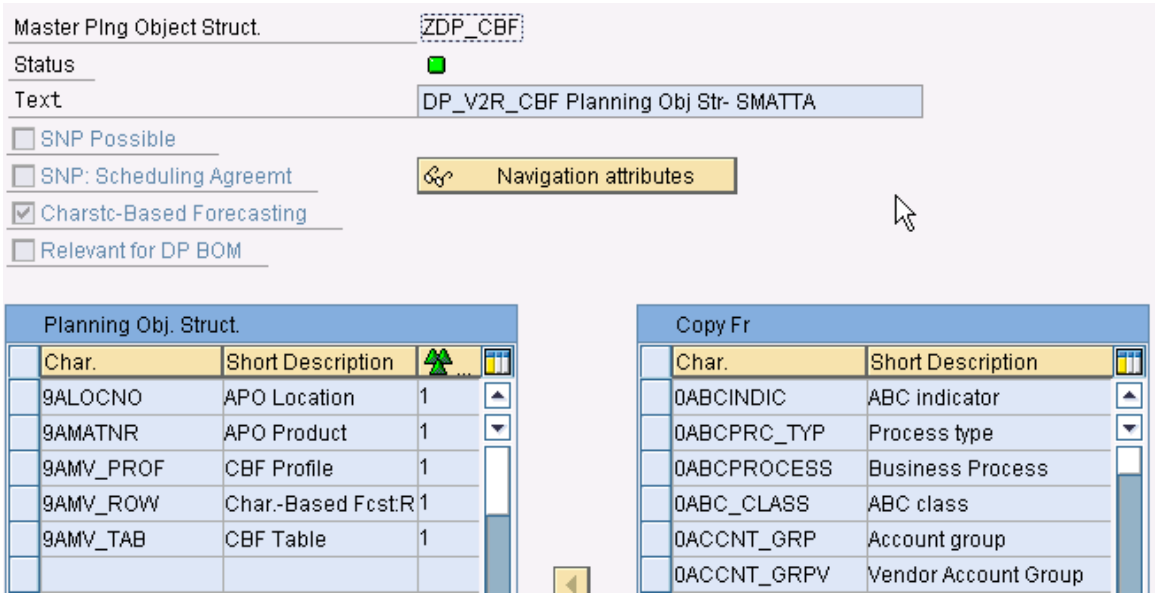
a) Planning object structure:

Transaction: /SAPAPO/MSDP_ADMIN - Administration of Demand Planning and Supply Network Planning

In Demand Planning, master planning object structure contains planning characteristics for one or more planning areas.

Master planning object structure is prerequisites for creating planning areas in Supply and Demand Planning.

Planning object structure: **ZDP_CBF**



Select the indicator Characteristic based forecasting, it will copy the characteristics: 9AMV_PROF, 9AMV_ROW and 9AMV_TAB

b) Planning Area:

Planning area is the central data structures for Demand Planning and Supply Network Planning. The live Cache objects in which data is saved are based on the planning area. You assign the key figures with which you want to work directly to the planning area.

Planning Area: **ZDP_V2R_CBF_PA01**

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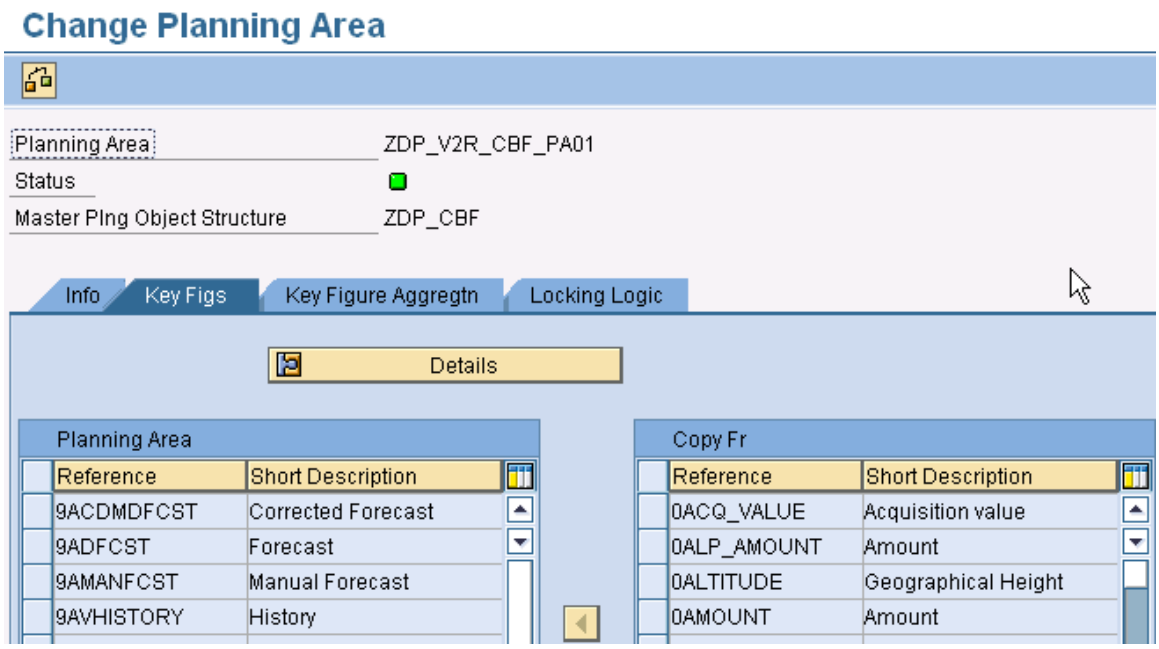
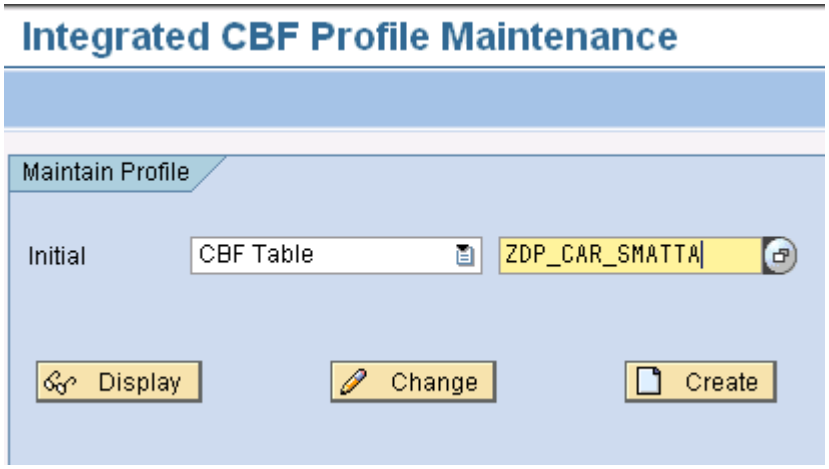


Settings for CBF in APO

a) Create CBF Table

To be able to carry out Characteristics-Based Forecasting, you must define a CBF table and assign it to the product. CBF tables contain details of the characteristics to be used and the permissible values and combinations.

Master Data → Application-Specific Master Data → Demand Planning → Configured Products → /SAPAPO/IPM01 - Maintain Master Data for CBF



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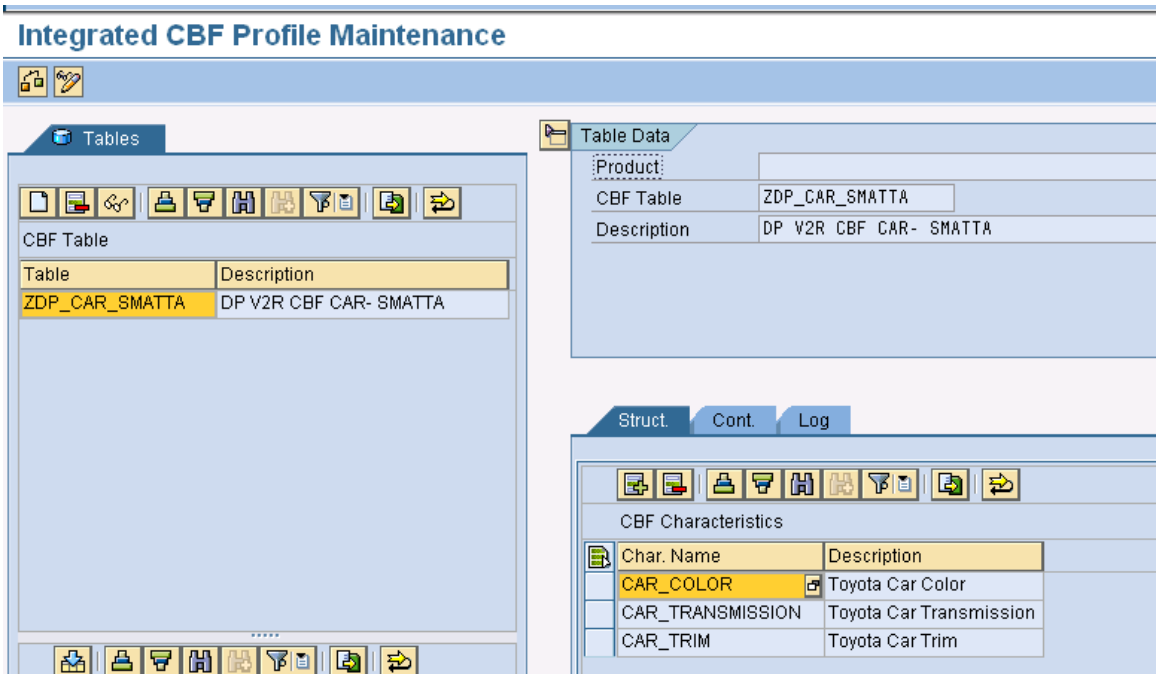

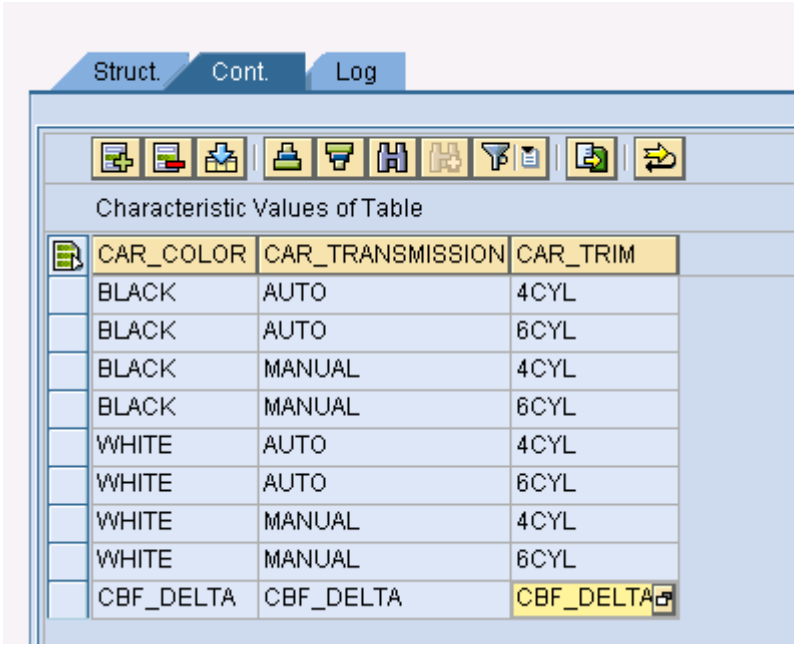

b) Maintain the CBF profile and table to Product

Assign CBF tables to CBF profiles in integrated profile management.

Maintain tables and profiles for individual products

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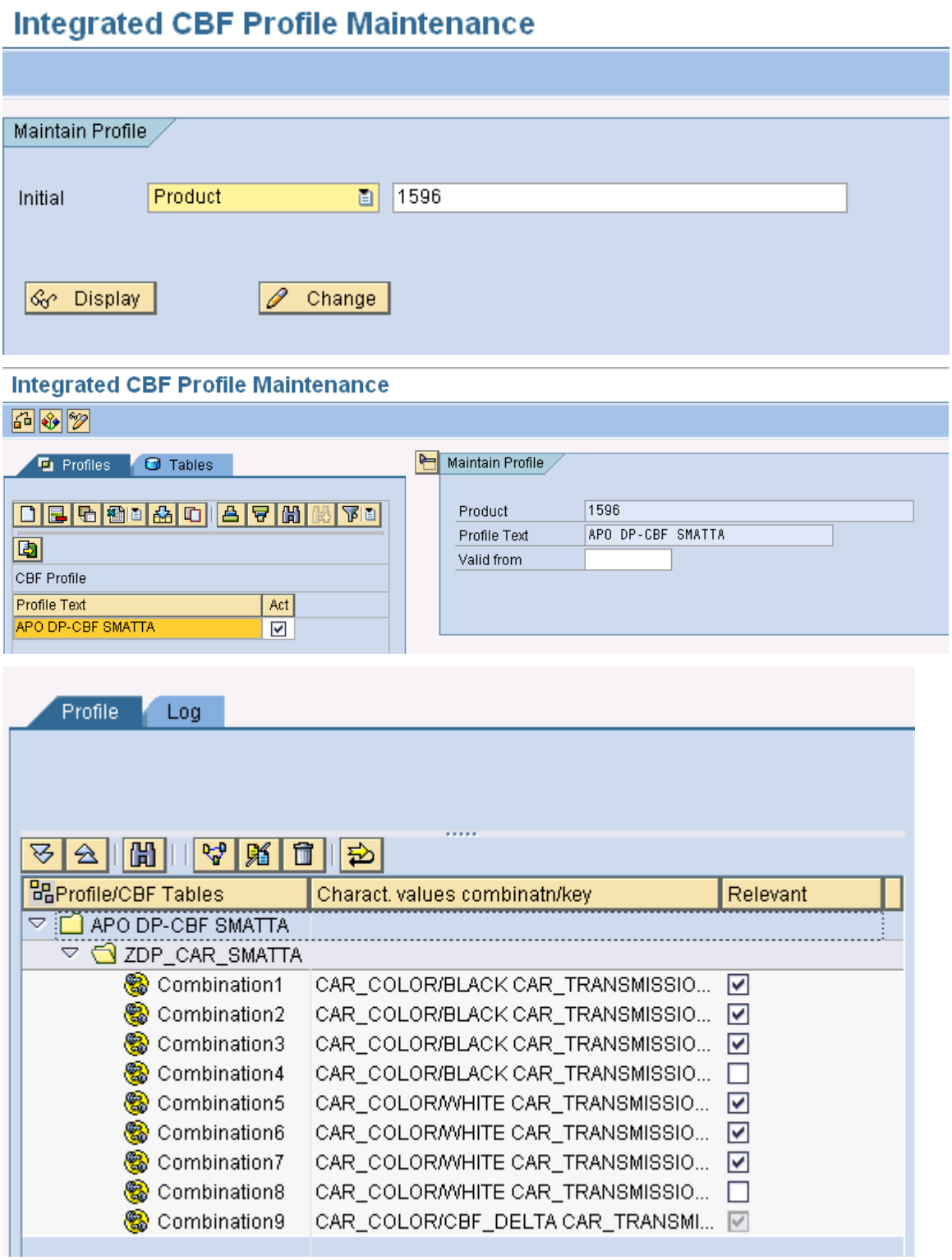

You can select Forecast planning indicator for the relevant characteristic value combinations

In the above scenario Car with 6 cylinder engine and Manual Transmission will not have planning indicator. So there will not be any forecasting for the above combinations.

c) Maintain Component oriented logic indicator

This function is intended for use in over-planning or under-planning scenarios.

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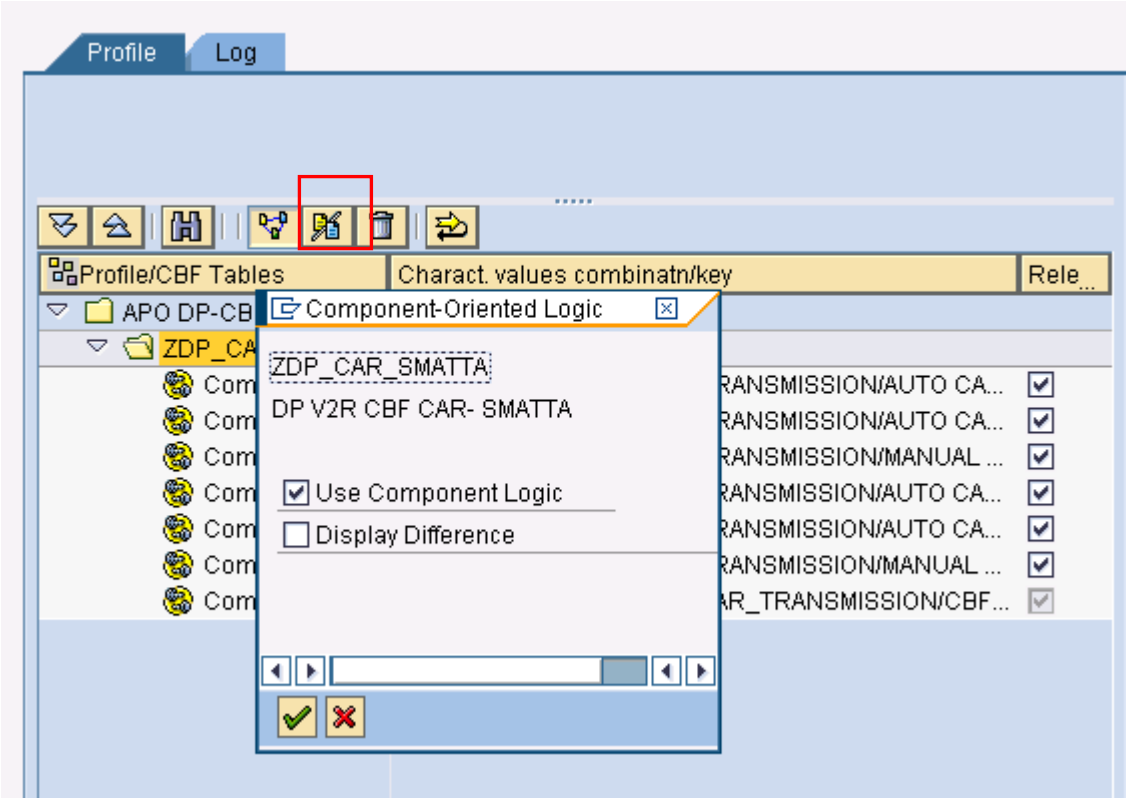
After an initial disaggregation to CBF characteristics it is possible to make changes at detail level without these changes being added to the total on the aggregate level. However to ensure consistency this difference can be displayed in the planning table in a separate row.



Demand Forecasting:

a) Characteristic Value Combinations:

A characteristic value combination is the combination of characteristic values with which you want to plan. It is only possible to plan data if you have defined such combinations.

Characteristic value combinations are defined for master planning object structure and these combinations are valid for all planning areas based on this planning object structure.

Master Data →Demand Planning Master Data → Maintain Characteristic Values.

Display Existing Characteristic Combinations

Internal Format

7 Data records selected for Planning Obj. Struct.: ZDP_CBF

9ALOCNO	9AMATNR	9AMV_PROF	9AMV_ROW	9AMV_TAB
3200	1596	32	1	3308
3200	1596	32	2	3308
3200	1596	32	3	3308
3200	1596	32	5	3308
3200	1596	32	6	3308
3200	1596	32	7	3308
3200	1596	32	9	3308

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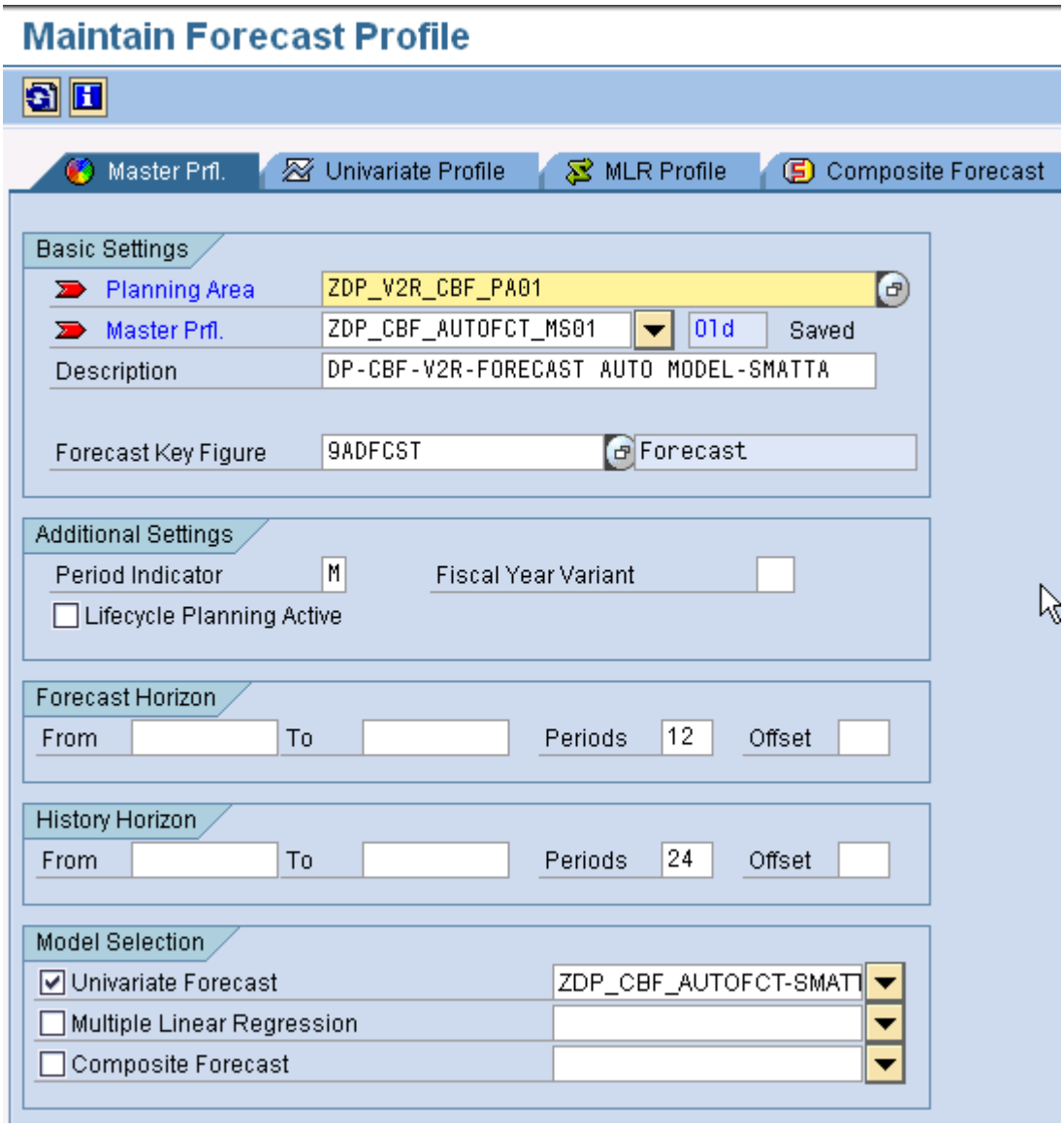
b) Maintain Forecast Profile

Define univariate forecasting profile for the planning area to forecast for the next 12 months based on the last 24 month history.

Transaction: /SAPAPO/MC96B - Maintain Forecast Profiles



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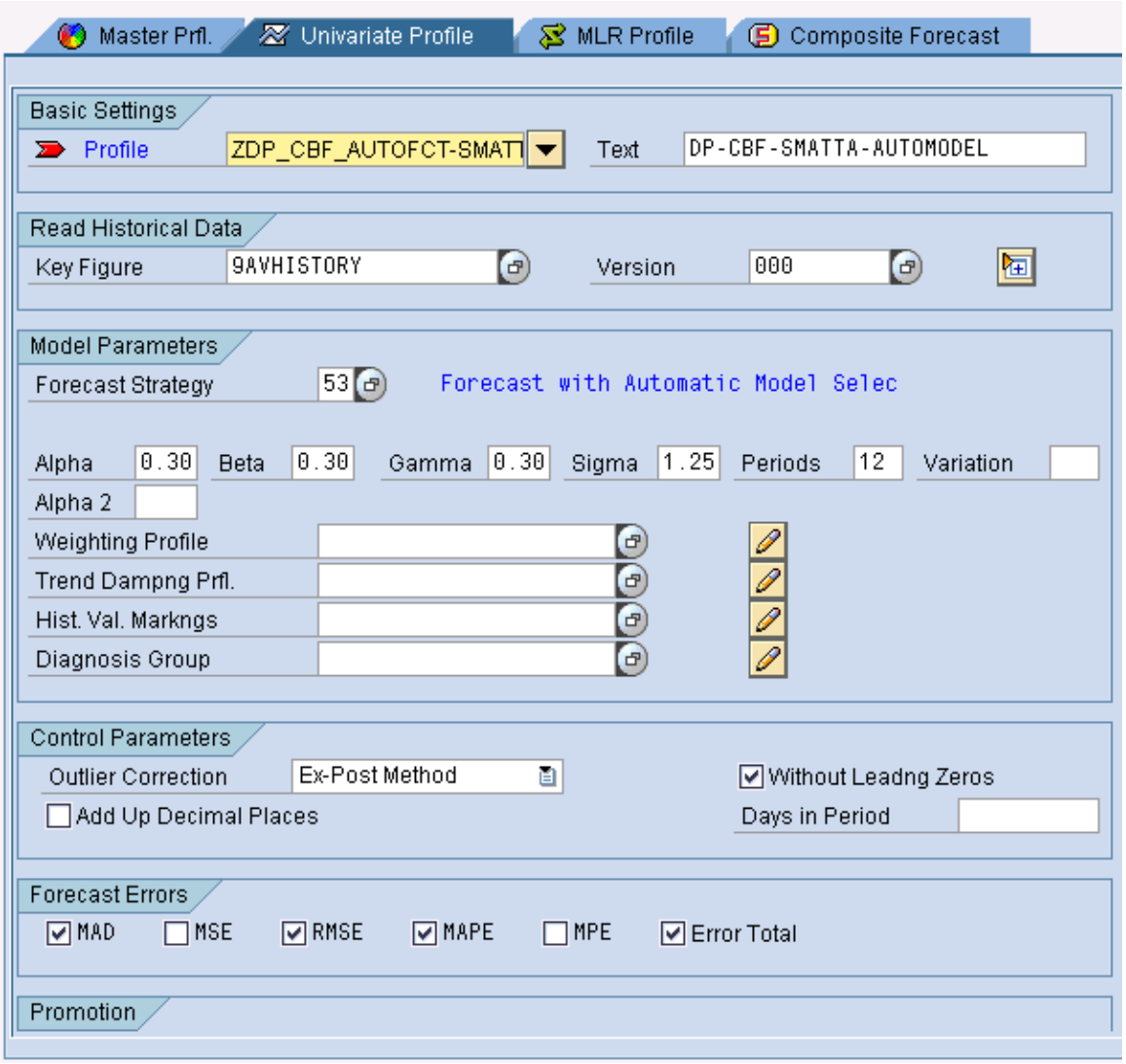

c) Define Planning Book

Planning books determine the content and layout of the interactive planning screen and it is based on the planning area. Planning books can be created for individual planner or department and corresponds to the planner requirements.

Transaction: /SAPAPO/SDP8B - Define Planning Book

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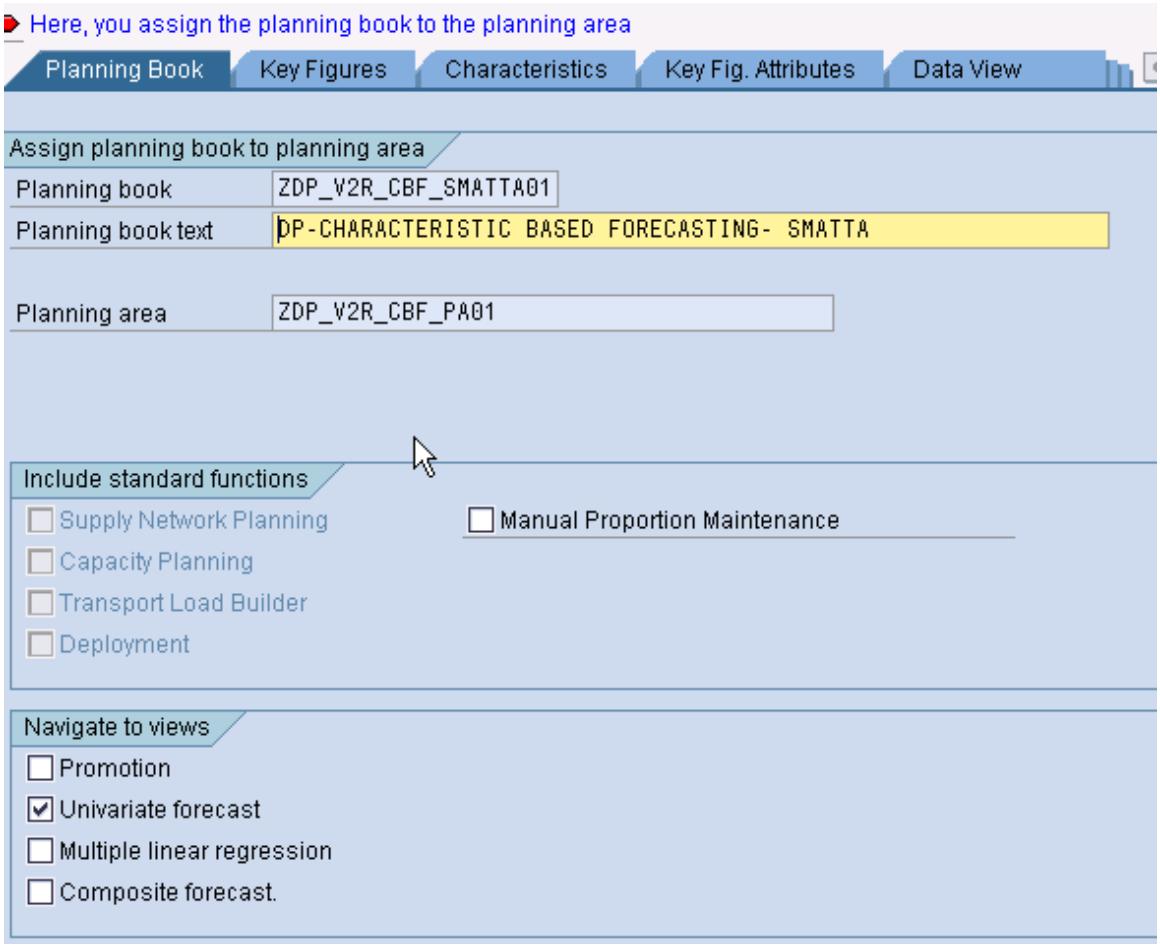
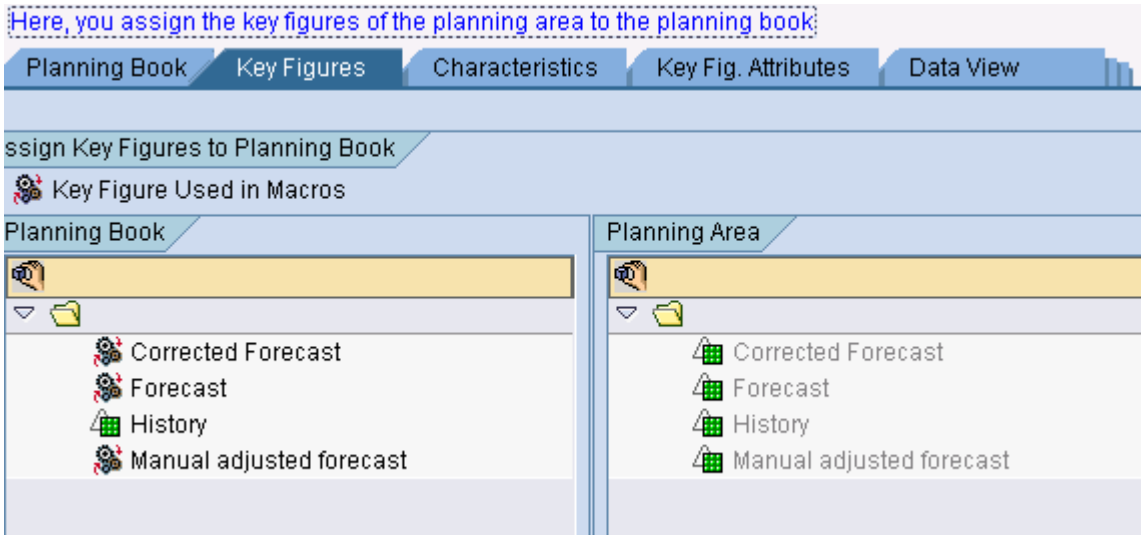

Here, you assign the planning book to the planning area
Planning Book
Key Figures
Characteristics
Key Fig. Attributes
Data View
Assign planning book to planning area
Planning book
ZDP_V2R_CBF_SMATTA01
Planning book text
DP-CHARACTERISTIC BASED FORECASTING- SMATTA
Planning area
ZDP_V2R_CBF_PA01
Include standard functions
Supply Network Planning
Manual Proportion Maintenance
Capacity Planning
Transport Load Builder
Deployment
Navigate to views
Promotion
Univariate forecast
Multiple linear regression
Composite forecast.


Here, you assign the key figures of the planning area to the planning book
Planning Book
Key Figures
Characteristics
Key Fig. Attributes
Data View
ssign Key Figures to Planning Book
Key Figure Used in Macros
Planning Book
Planning Area
Corrected Forecast
Forecast
History
Manual adjusted forecast
Corrected Forecast
Forecast
History
Manual adjusted forecast

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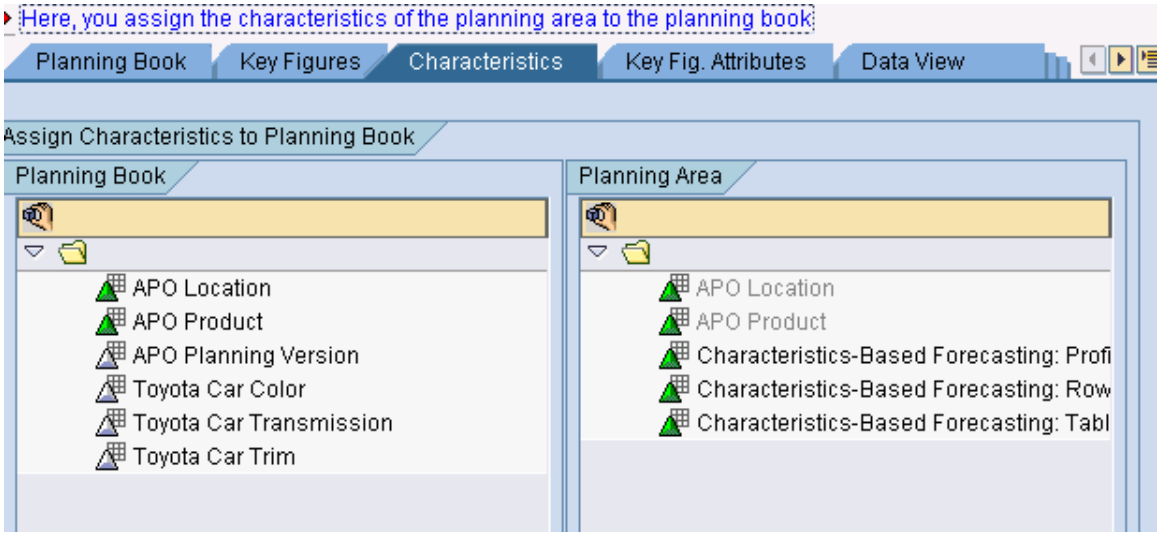
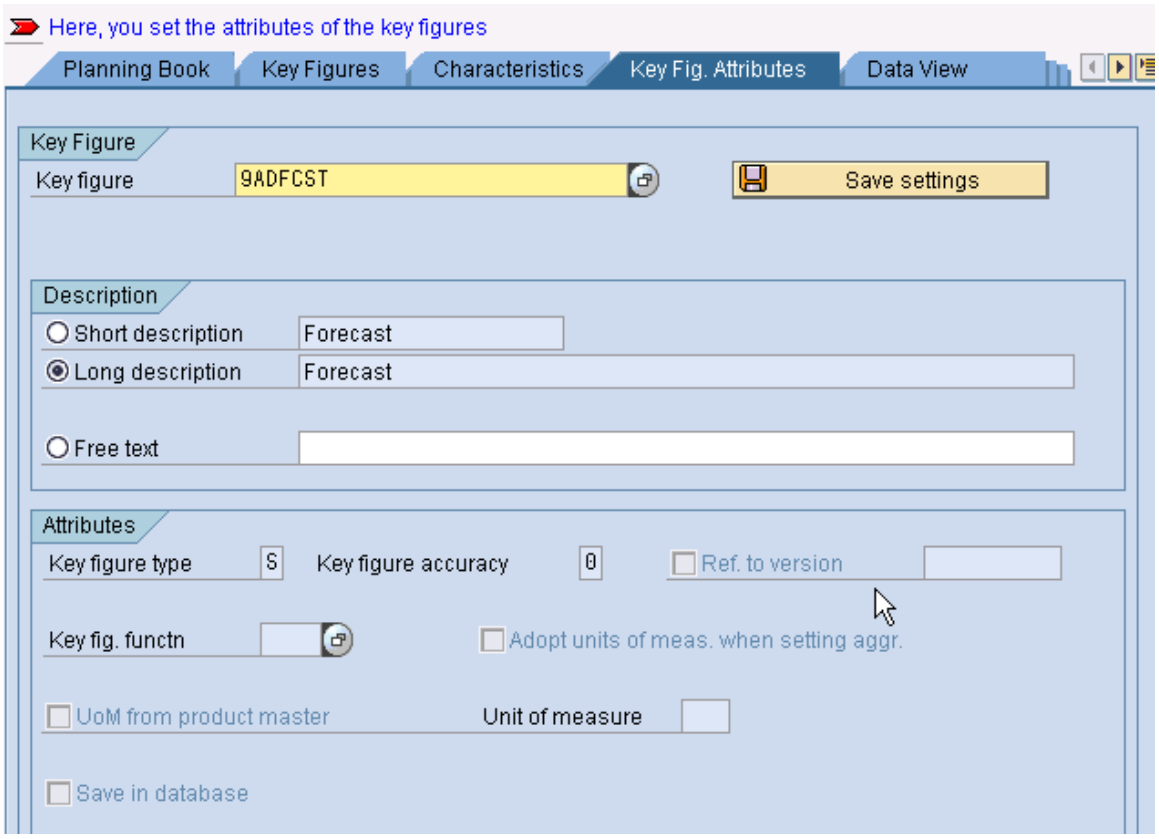

Here, you assign the characteristics of the planning area to the planning book
Planning Book
Key Figures
Characteristics
Key Fig. Attributes
Data View
Assign Characteristics to Planning Book
Planning Book
Planning Area
APO Location
APO Product
APO Planning Version
Toyota Car Color
Toyota Car Transmission
Toyota Car Trim
APO Location
APO Product
Characteristics-Based Forecasting: Profi
Characteristics-Based Forecasting: Row
Characteristics-Based Forecasting: Tabl


Here, you set the attributes of the key figures
Planning Book
Key Figures
Characteristics
Key Fig. Attributes
Data View
Key Figure
Key figure
9ADFCST
Save settings
Description
Short description
Forecast
Long description
Forecast
Free text
Attributes
Key figure type
S
Key figure accuracy
0
Ref. to version
Key fig. functn
Adopt units of meas. when setting aggr.
UoM from product master
Unit of measure
Save in database

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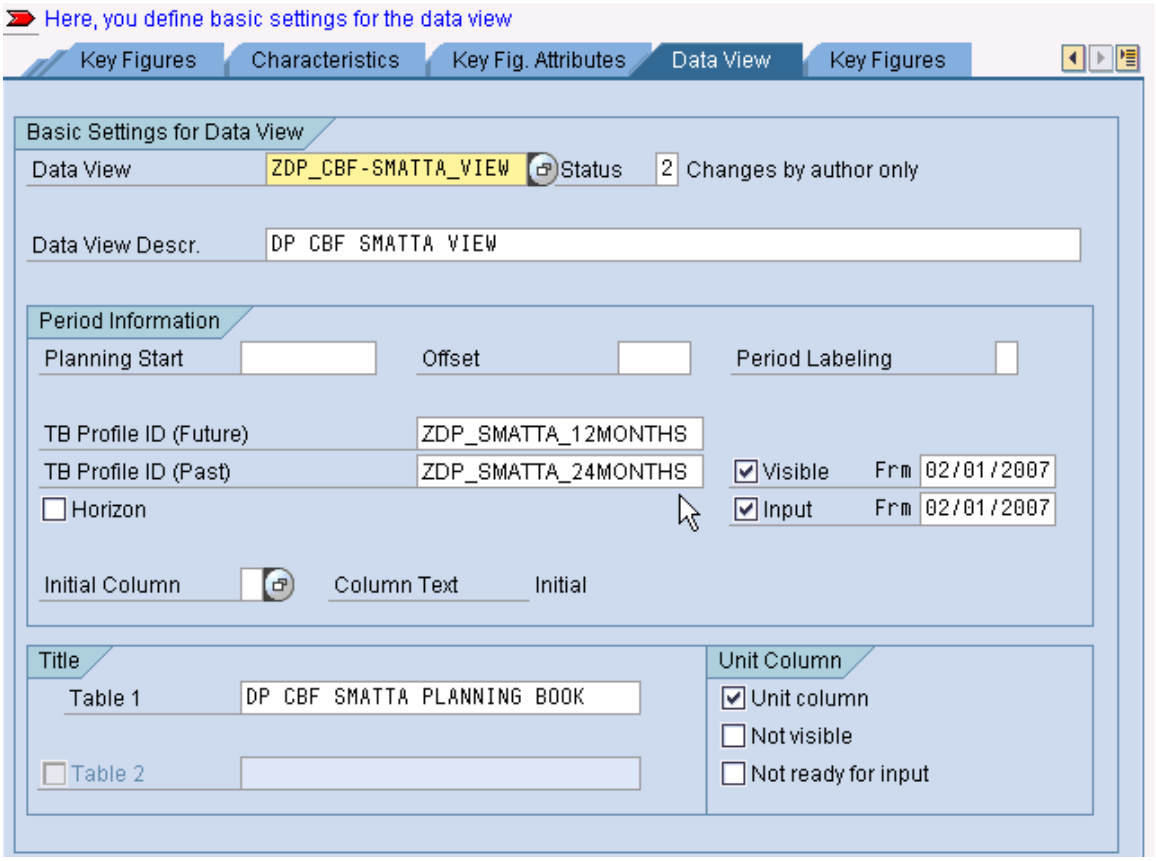


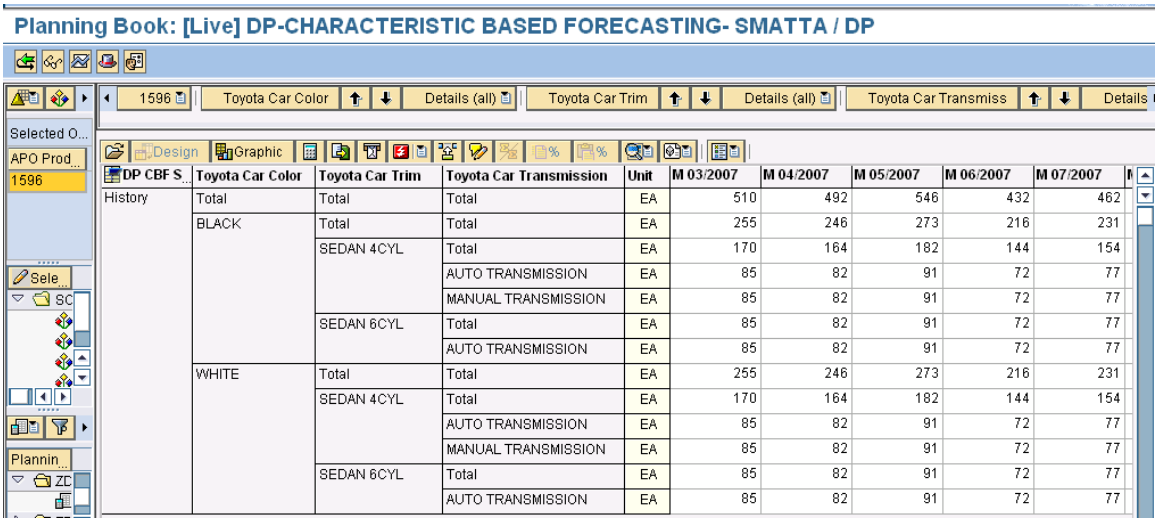
d) Interactive Demand Planning

Transaction: /SAPAPO/SDP94 - Interactive Demand Planning

Interactive demand planning can be used for several purposes that include to create the demand forecast interactively, to validate different univariate forecast models, to verify the results of a forecast created in the background and to process alerts issued in background jobs.

Demand plan can be created for the characteristics or characteristic combinations. This can be done either in interactive demand planning or by running a background job. You can use the drill-down functions in the header to see all the characteristic values.

- In this scenario, maintain the history for 24 months (032007 to 022009):



DP CBF S...	Toyota Car Color	Toyota Car Trim	Toyota Car Transmission	Unit	M 03/2007	M 04/2007	M 05/2007	M 06/2007	M 07/2007
History	Total	Total	Total	EA	510	492	546	432	462
	BLACK	Total	Total	EA	255	246	273	216	231
		SEDAN 4CYL	Total	EA	170	164	182	144	154
			AUTO TRANSMISSION	EA	85	82	91	72	77
			MANUAL TRANSMISSION	EA	85	82	91	72	77
		SEDAN 6CYL	Total	EA	85	82	91	72	77
			AUTO TRANSMISSION	EA	85	82	91	72	77
	WHITE	Total	Total	EA	255	246	273	216	231
		SEDAN 4CYL	Total	EA	170	164	182	144	154
			AUTO TRANSMISSION	EA	85	82	91	72	77
			MANUAL TRANSMISSION	EA	85	82	91	72	77
		SEDAN 6CYL	Total	EA	85	82	91	72	77
			AUTO TRANSMISSION	EA	85	82	91	72	77

- Execute demand forecasted for next 12 months (032009 to 022010):

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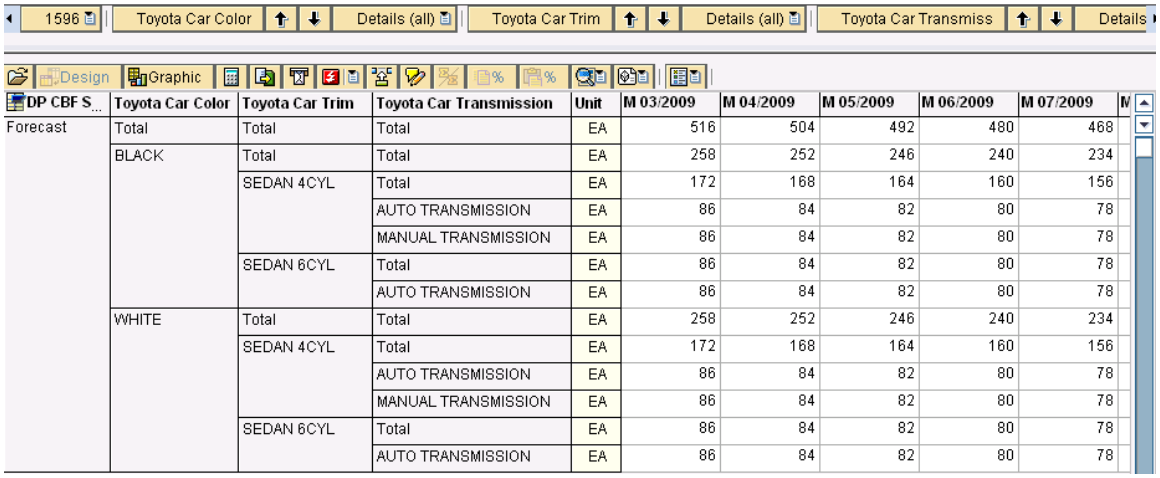
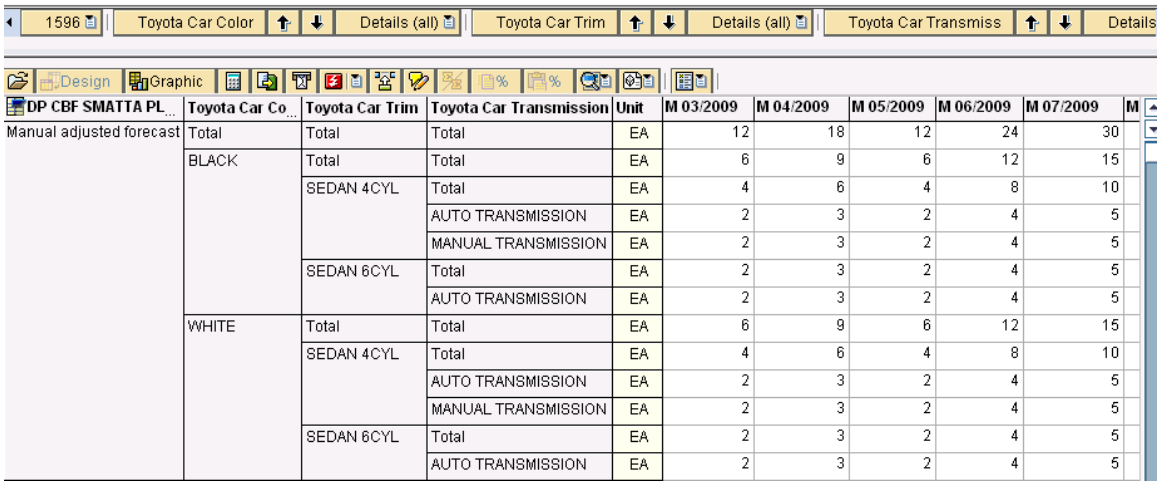


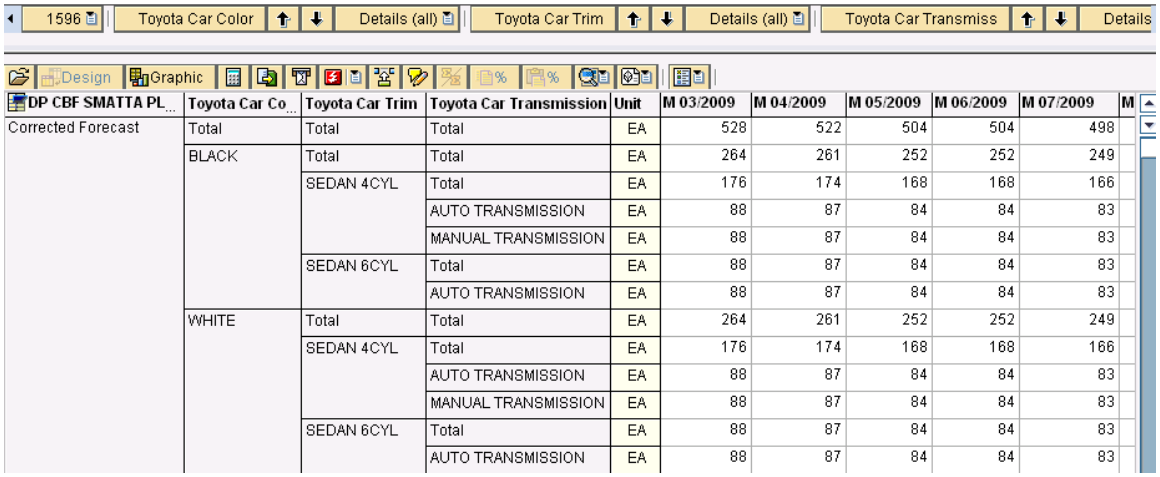
DP CBF S...	Toyota Car Color	Toyota Car Trim	Toyota Car Transmission	Unit	M 03/2009	M 04/2009	M 05/2009	M 06/2009	M 07/2009
Forecast	Total	Total	Total	EA	516	504	492	480	468
	BLACK	Total	Total	EA	258	252	246	240	234
		SEDAN 4CYL	Total	EA	172	168	164	160	156
			AUTO TRANSMISSION	EA	86	84	82	80	78
			MANUAL TRANSMISSION	EA	86	84	82	80	78
		SEDAN 6CYL	Total	EA	86	84	82	80	78
			AUTO TRANSMISSION	EA	86	84	82	80	78
	WHITE	Total	Total	EA	258	252	246	240	234
		SEDAN 4CYL	Total	EA	172	168	164	160	156
			AUTO TRANSMISSION	EA	86	84	82	80	78
			MANUAL TRANSMISSION	EA	86	84	82	80	78
		SEDAN 6CYL	Total	EA	86	84	82	80	78
			AUTO TRANSMISSION	EA	86	84	82	80	78

- Add Manual Adjusted Forecast:



DP CBF SMATTA PL...	Toyota Car Co...	Toyota Car Trim	Toyota Car Transmission	Unit	M 03/2009	M 04/2009	M 05/2009	M 06/2009	M 07/2009
Manual adjusted forecast	Total	Total	Total	EA	12	18	12	24	30
	BLACK	Total	Total	EA	6	9	6	12	15
		SEDAN 4CYL	Total	EA	4	6	4	8	10
			AUTO TRANSMISSION	EA	2	3	2	4	5
			MANUAL TRANSMISSION	EA	2	3	2	4	5
		SEDAN 6CYL	Total	EA	2	3	2	4	5
			AUTO TRANSMISSION	EA	2	3	2	4	5
	WHITE	Total	Total	EA	6	9	6	12	15
		SEDAN 4CYL	Total	EA	4	6	4	8	10
			AUTO TRANSMISSION	EA	2	3	2	4	5
			MANUAL TRANSMISSION	EA	2	3	2	4	5
		SEDAN 6CYL	Total	EA	2	3	2	4	5
			AUTO TRANSMISSION	EA	2	3	2	4	5

- Execute Macro to calculate Corrected Forecast (Final demand) which is the sum of the Forecast and Manual adjusted Forecast:



DP CBF SMATTA PL...	Toyota Car Co...	Toyota Car Trim	Toyota Car Transmission	Unit	M 03/2009	M 04/2009	M 05/2009	M 06/2009	M 07/2009
Corrected Forecast	Total	Total	Total	EA	528	522	504	504	498
	BLACK	Total	Total	EA	264	261	252	252	249
		SEDAN 4CYL	Total	EA	176	174	168	168	166
			AUTO TRANSMISSION	EA	88	87	84	84	83
			MANUAL TRANSMISSION	EA	88	87	84	84	83
		SEDAN 6CYL	Total	EA	88	87	84	84	83
			AUTO TRANSMISSION	EA	88	87	84	84	83
	WHITE	Total	Total	EA	264	261	252	252	249
		SEDAN 4CYL	Total	EA	176	174	168	168	166
			AUTO TRANSMISSION	EA	88	87	84	84	83
			MANUAL TRANSMISSION	EA	88	87	84	84	83
		SEDAN 6CYL	Total	EA	88	87	84	84	83
			AUTO TRANSMISSION	EA	88	87	84	84	83

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Related Content

1. SAP Help: http://help.sap.com
2. http://help.sap.com/saphelp_scm50/helpdata/en/58/39df3a6610696ae10000000a11402f/frameset.htm

For more information, visit the Supply Chain Management homepage.

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