

Supply Chain Consulting Services

Predict, Plan and Perform using SAP Supply Chain Management (SCM) suite

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Objectives

Objectives are:

- 1. Understand SAP SCM planning functionalities, with focus on CPG relevant functionality.**
- 2. Understand SAP SCM integration with other (SAP) systems**
- 3. Understand SAP SCM data exchange**

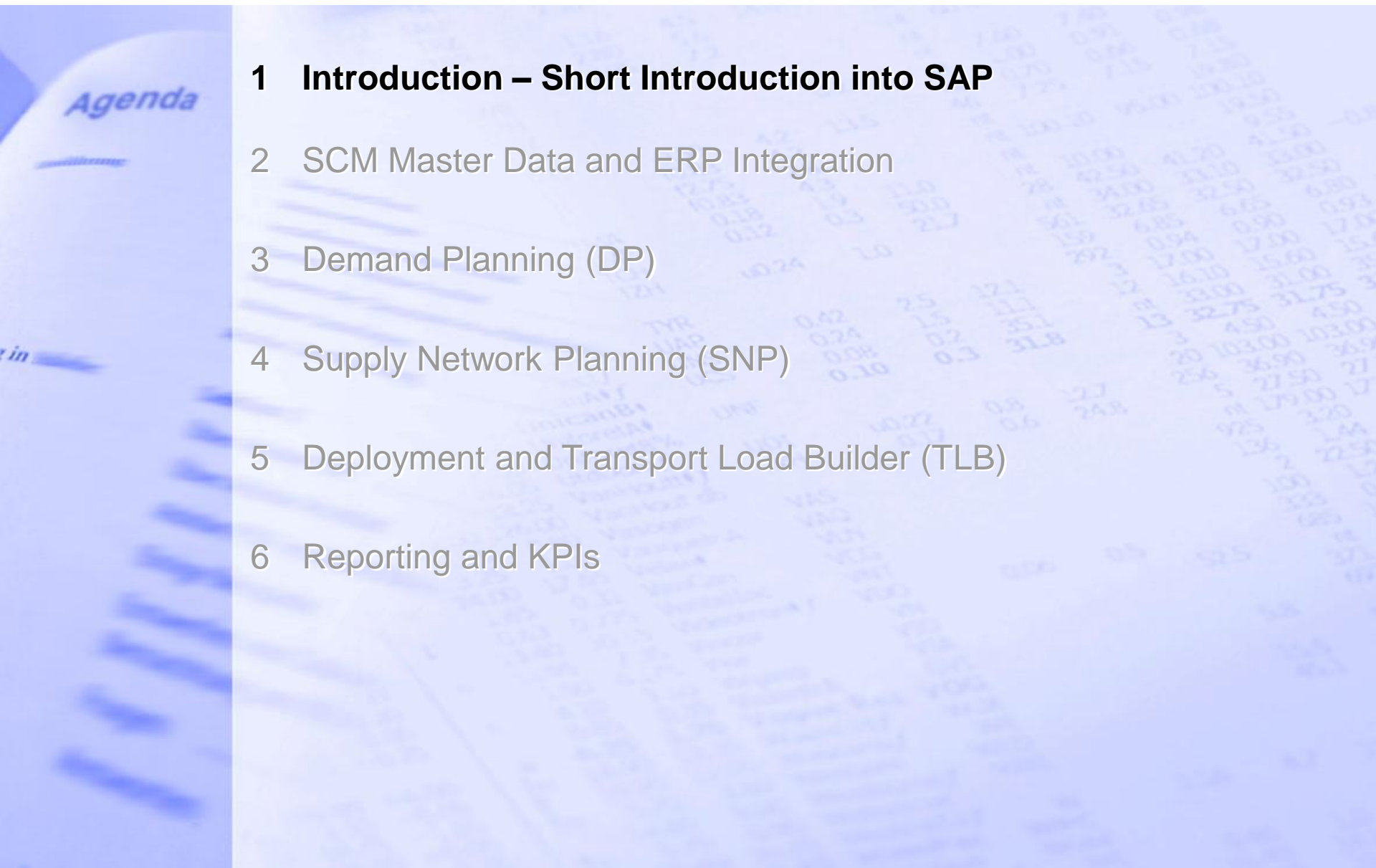
Objectives are not:

- 1. Configuration / Customizing**
- 2. (Process) Modeling**
- 3. End user training**

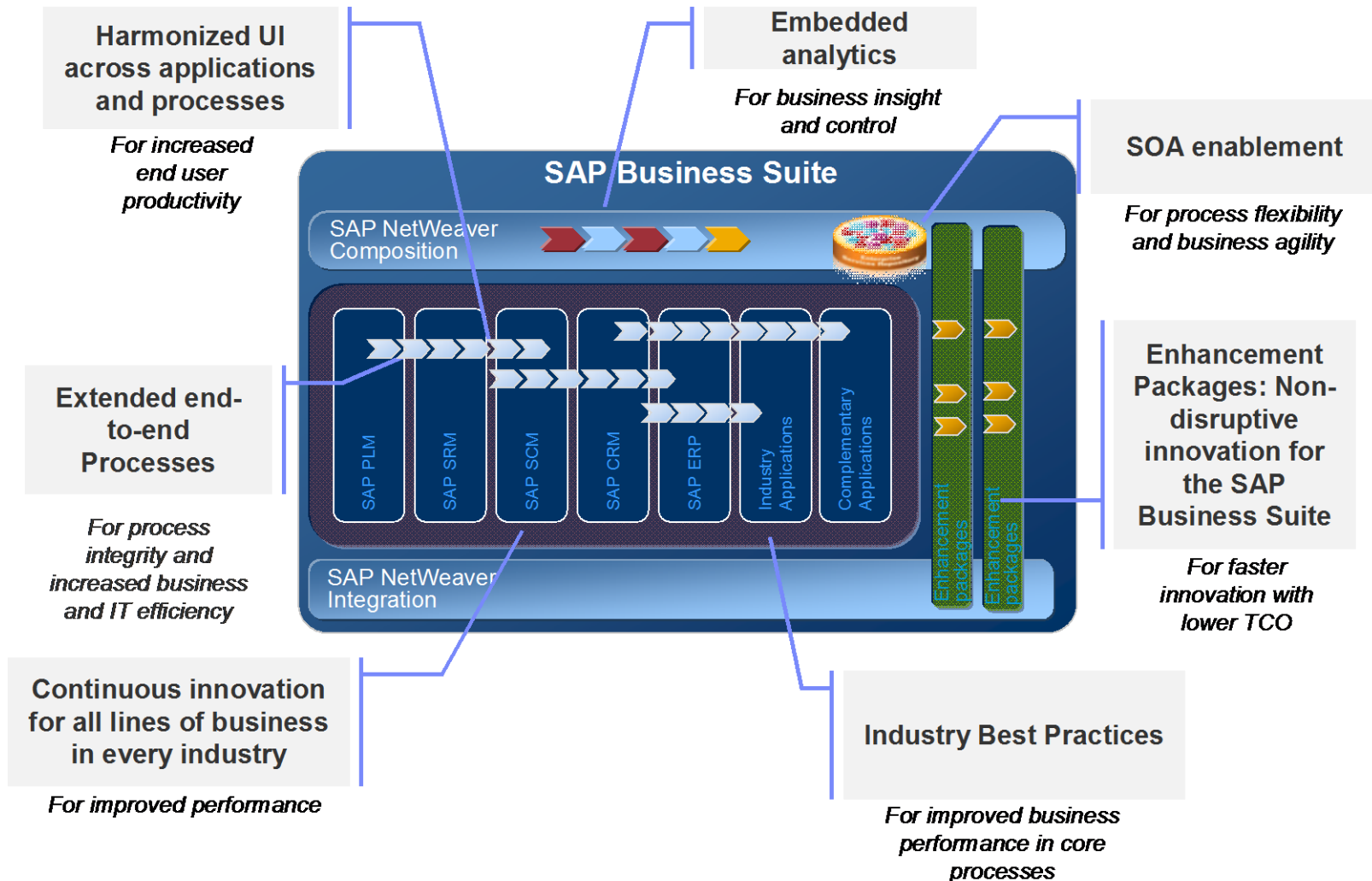
➤ SCM awareness session with focus the facilitation of an efficient fit / gap session

Agenda SAP SCM Awareness Session for CPG

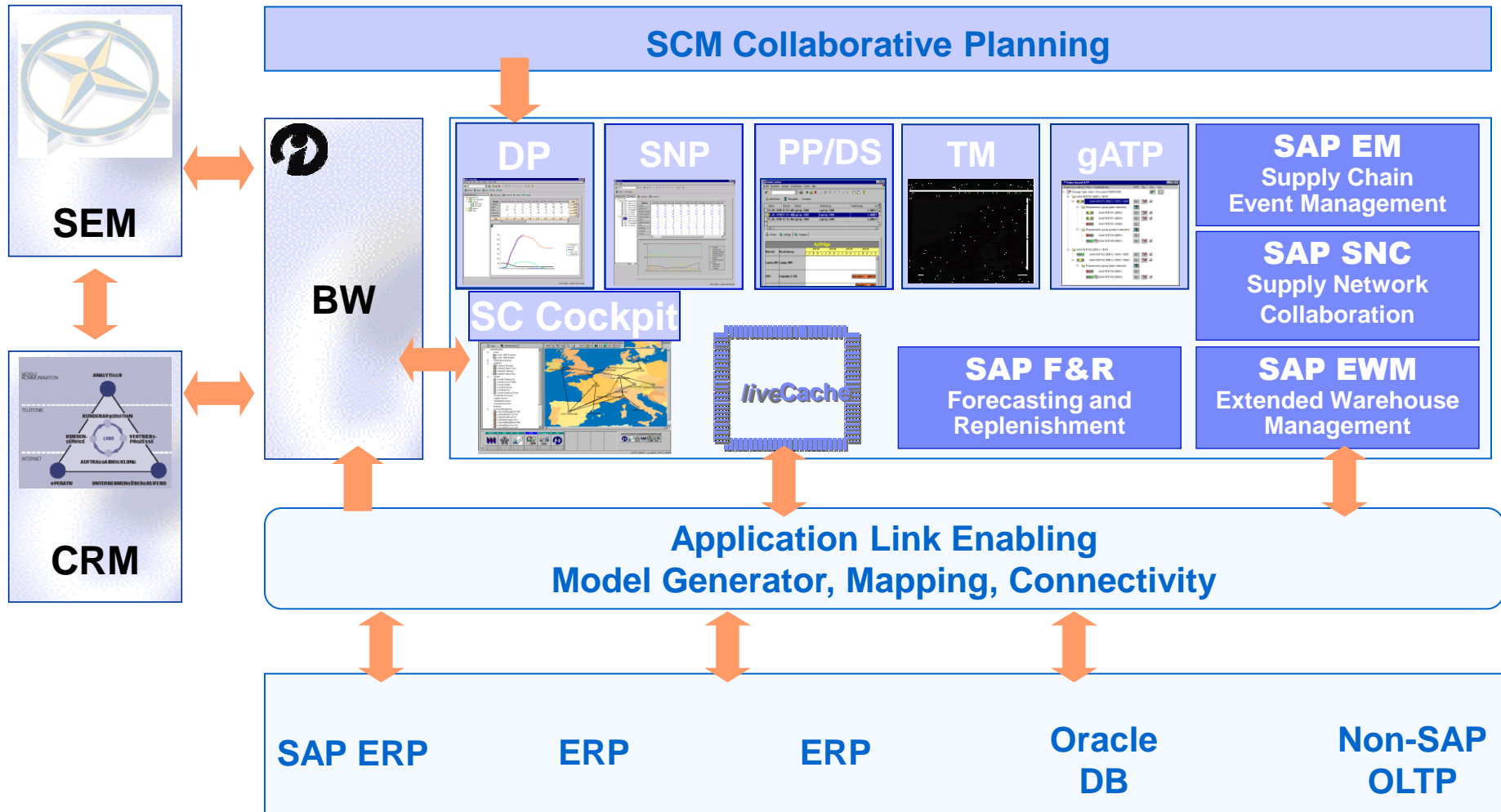
Item
1. Introduction / Overview Key Functions of SAP SCM <ul style="list-style-type: none"> 1. SAP and SAP SCM overview 2. SCM solution architecture, focus on DP & SNP
2. SCM Master Data and ERP Integration <ul style="list-style-type: none"> 2.1 SCM Master Data and Transaction Data 2.2 CIF (Core Interface) for SAP ERP Integration 2.3 SCM Integration into non-SAP environment
3. Demand Planning (DP) <ul style="list-style-type: none"> 3.1 DP Process Flow 3.2 Forecasting (Forecast methods, Analysis, Demand Alert profiles) 3.3 Lifecycle Planning (Realignment, Lifecycle, promotion etc)
4. Supply Network Planning (SNP) <ul style="list-style-type: none"> 4.1 SNP Standard Functionality Overview 4.2 SNP Process Flow 4.3 SNP Planning Methods
5. Deployment and Transport Load Builder <ul style="list-style-type: none"> 5.1 Basics of Deployment 5.2 Transport Load Builder (TLB)
6. Reporting and KPIs

- 
- 1 Introduction – Short Introduction into SAP**
- 2 SCM Master Data and ERP Integration
- 3 Demand Planning (DP)
- 4 Supply Network Planning (SNP)
- 5 Deployment and Transport Load Builder (TLB)
- 6 Reporting and KPIs

SAP Business Suite 7: Architectural Advances



SAP SCM – an integrated solution



What are the major differences vs. previous versions? Value Scenarios and Step-by-Step Guides



COO



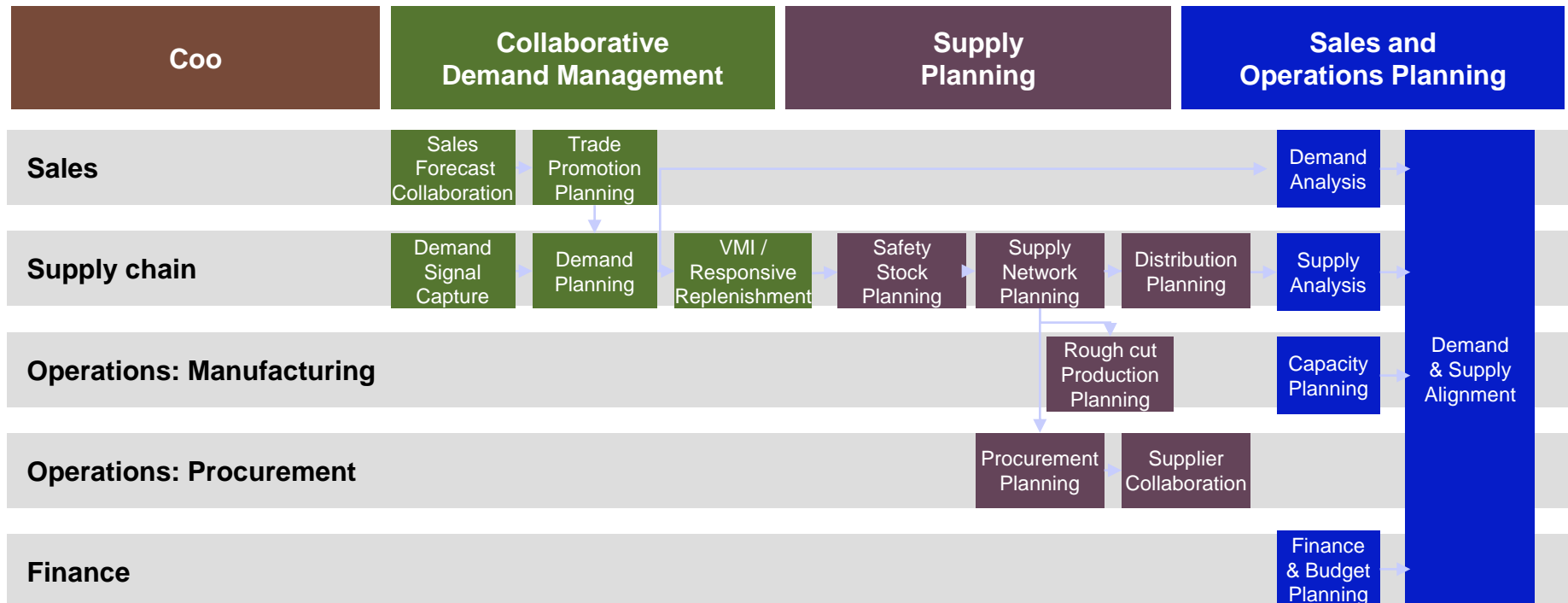
Sales



Supply chain



Operations



SAP SCM Structure



Synchronize supply with demand in your global supply chain by balancing push and pull network-planning processes and by handling replenishment and production based on actual demand.

- APO DP: Improves the forecast quality and planning accuracy
- APO SNP: Improves visibility across your global supply chain and lowers inventory
- APO PP/DS: Supports you in creating optimized production plans
- APO gATP: Allows state-of-the-art sales order confirmation planning processes
- APO TP/VS: Optimizes transportation loads and minimizes transportation costs
- APO Alert Monitor: Powerful exception message system integrated in all APO planning modules

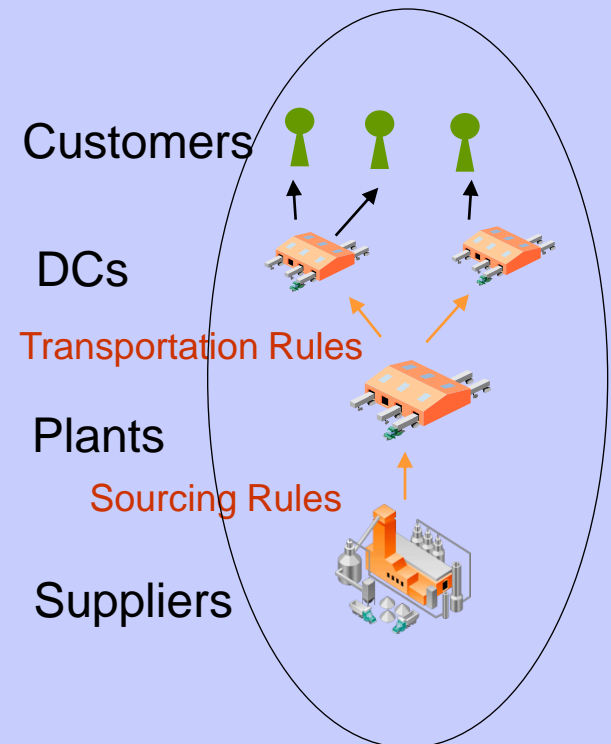
- 
- 1 Introduction
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- Open Questions

SCM Master Data – Main Elements

Main Master Data Elements

- Material master
- Locations (plants, DCs, warehouses)
- Customer master data
- Supplier info records
- Quotas
- Frame Agreements
- Transportation Lanes (ship from-to)
- Transportatoin Types
- Resources
- BOMs
- Routings
- Capacities
- Calendars (DC, Transport, Plant)

Supply Chain Model



Integration of Master Data via Core Interface (CIF)

CIF is an online transaction that defines active data channel(s) in SAP ERP for data transfer between SAP ERP systems and SCM. It has the following features:

- ✓ Real Time Interface
- ✓ Supplies SCM with defined master data and transaction data
- ✓ Forwards Data Changes (Transaction Data)
- ✓ Returns Planning Results to SAP R/3
- ✓ Initial transfer, change transfer

SAP R/3

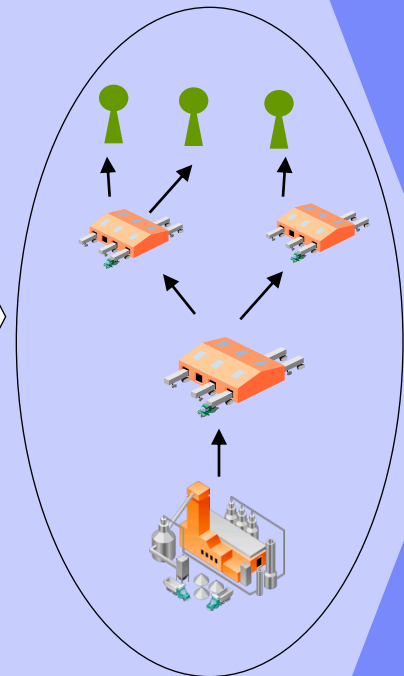


SCM

Initial
Transfer

CIF

Change
Transfer



Model 000

SCM Transaction Data – Main Elements

Main Transaction Data Elements

Primary demands :

- Sales orders (history)
- Planned primary demand

Inventory:

- Stocks
- Receipts

Stock Transfers:

- SNP Stock Transfer Requirements
- Deployment Stock Transfer Orders
- TLB-Transports

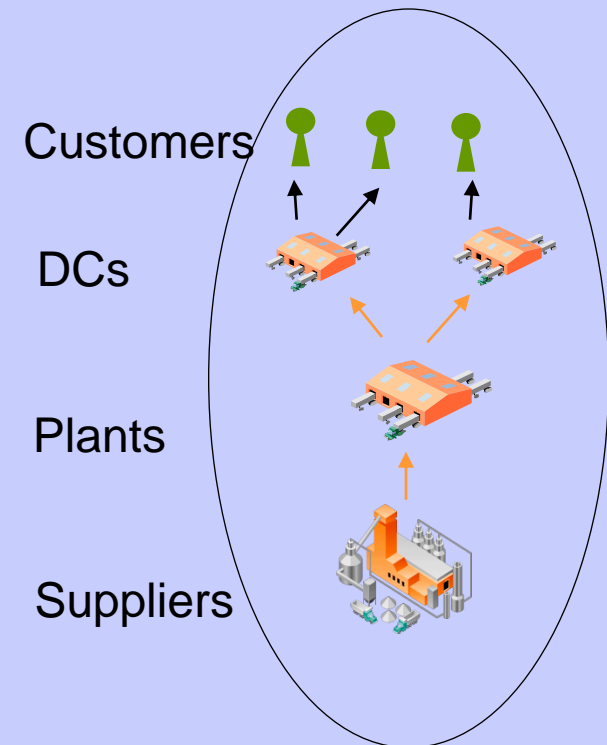
Production:

- Planned Orders
- Production Orders

Procurement:

- Purchase Requisitions
- Purchase Orders

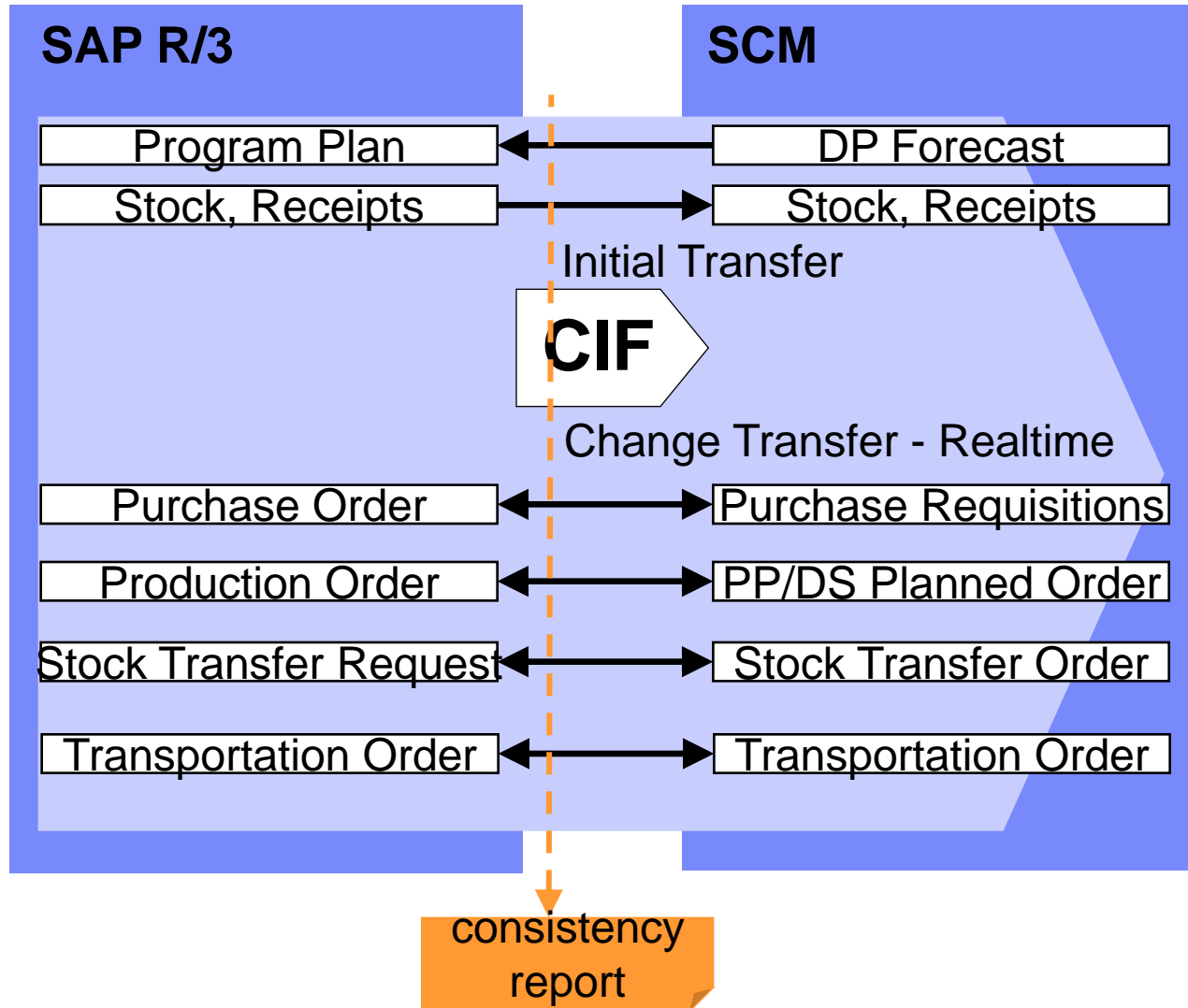
Planning of Supply Chain



Integration of Transaction Data via Core Interface (CIF)

CIF also provides active channels for SAP ERP for transaction data transfer between SAP ERP systems and SCM. It has the following features:

- ✓ Real Time Interface
- ✓ Supplies SCM with defined Transaction Data
- ✓ Forwards Data Changes (Transaction Data)
- ✓ Returns Planning Results to SAP R/3
- ✓ Initial transfer, change transfer
- ✓ Consistency Report: R/3 compared to SCM, SCM compared to R/3



SAP ECC data integration with SAP SCM

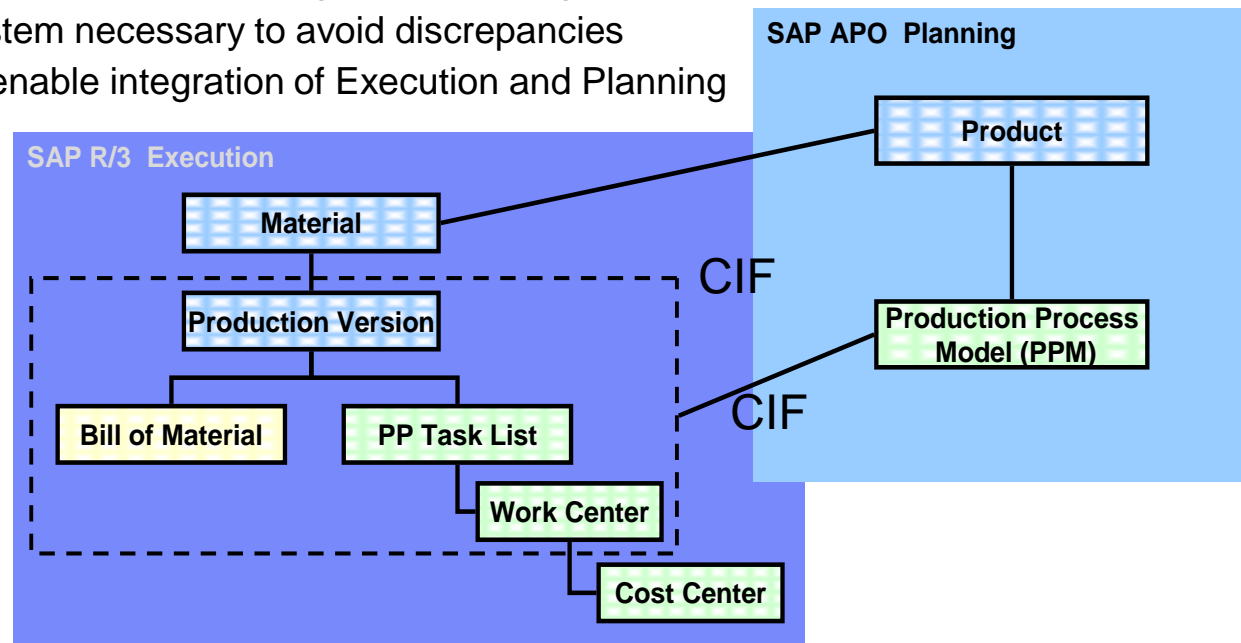
Integration via logistic model and additional customizing

- Logistic model of R/3 plants and warehouses
- In case of integration R/3 and SCM, settings for R/3 modules MM, PP and SD need to be customized (e.g. sales and purchase org.)

Integration via SAP R/3 Master Data

- R/3 master data basis for Supply Chain Planning and Reporting
- One leading master data system necessary to avoid discrepancies
- Harmonized master data to enable integration of Execution and Planning

Logistic model, logistical structure and master data structure define the integration between SCM and R/3. R/3 hereby is the leading system.



SCM integration with non-SAP ERP systems

Guidelines and Observations from other projects

- Build custom data transfer (flat file, .xls) to SCM for input data and output data
- Setup manual maintenance processes of supply chain model related data in SCM product master
- Ensure Data Integrity and Data Quality by
 - the custom interfaces itself
 - an additional integration layer
 - the source systems
- SCM does not include specific tools for ensuring data consistency between SCM and non-SAP systems
- However, one common SCM product master ensures consistent data for DP and SNP

Agenda

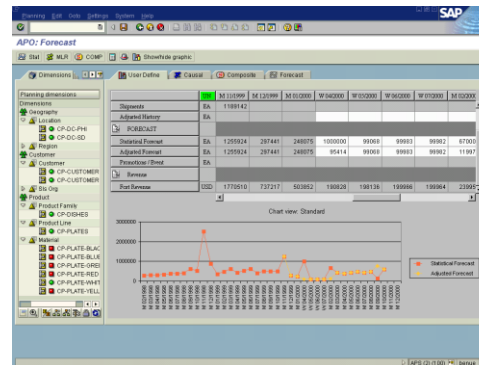
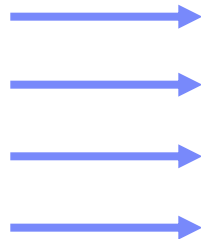
- 1 Introduction
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Demand Planning - Overview

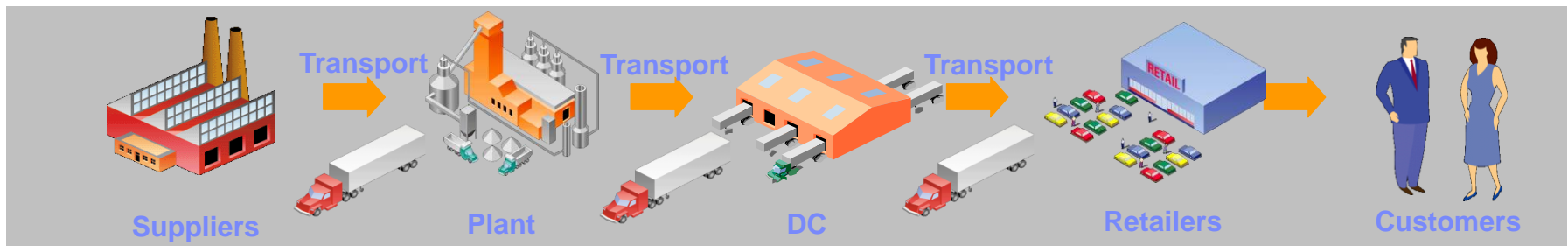
With Demand Planning a consistent and accurate **forecast** that incorporates historical information, internal and external intelligence, and promotional plans **is generated** that can be used to ensure product availability and drive operational efficiencies.

Demand Planning offers detailed **analysis** and **manipulation** of information to produce a **consensus** demand plan, that drives all supply chain functions.

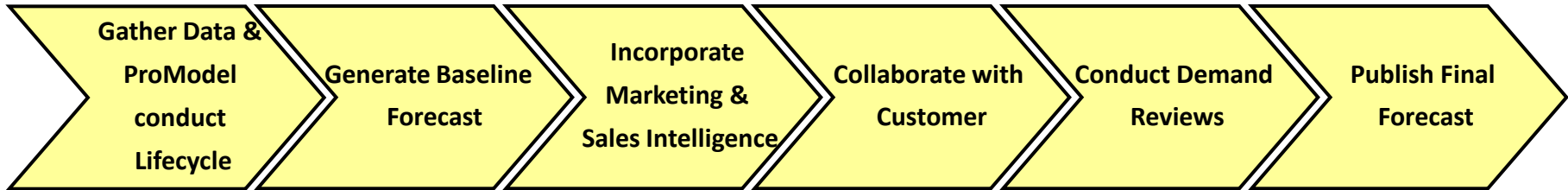
Historical data
Market intelligence
Phase in/phase out info
Promotions



Consensus
Demand Plan



Demand Planning Process Flow



Set-up Hierarchies

- Multi-dimensional hierarchies (Product, Customer, Geography, etc.)

Model Product Lifecycle

- Multiple sources of historical data: Sales Order and Consumption based History (POS).
- Maintain Like profile, phase-ins and phase-out profiles.
- Execute data realignments.

Generate Baseline Forecast

- History data analysis & correction.
- Advance statistical modeling techniques (e.g. Pick - best).
- Causal based forecasting.

Incorporate Marketing/Sales Intelligence

- Promotion Planning.
- Cannibalization.
- Sales and marketing collaboration using offline excel based Duet Sheets.

Collaborate with Customer

- POS based forecasting at customer locations.
- CPFR / Customer collaboration.

Conduct Demand Review

- Forecast Valuation – Revenue(\$) vs. Consensus Forecast(\$) and UOM conversion of volume.
- Forecast Accuracy KPI's.
- Waterfall Report Analytics.
- What-if Scenarios.

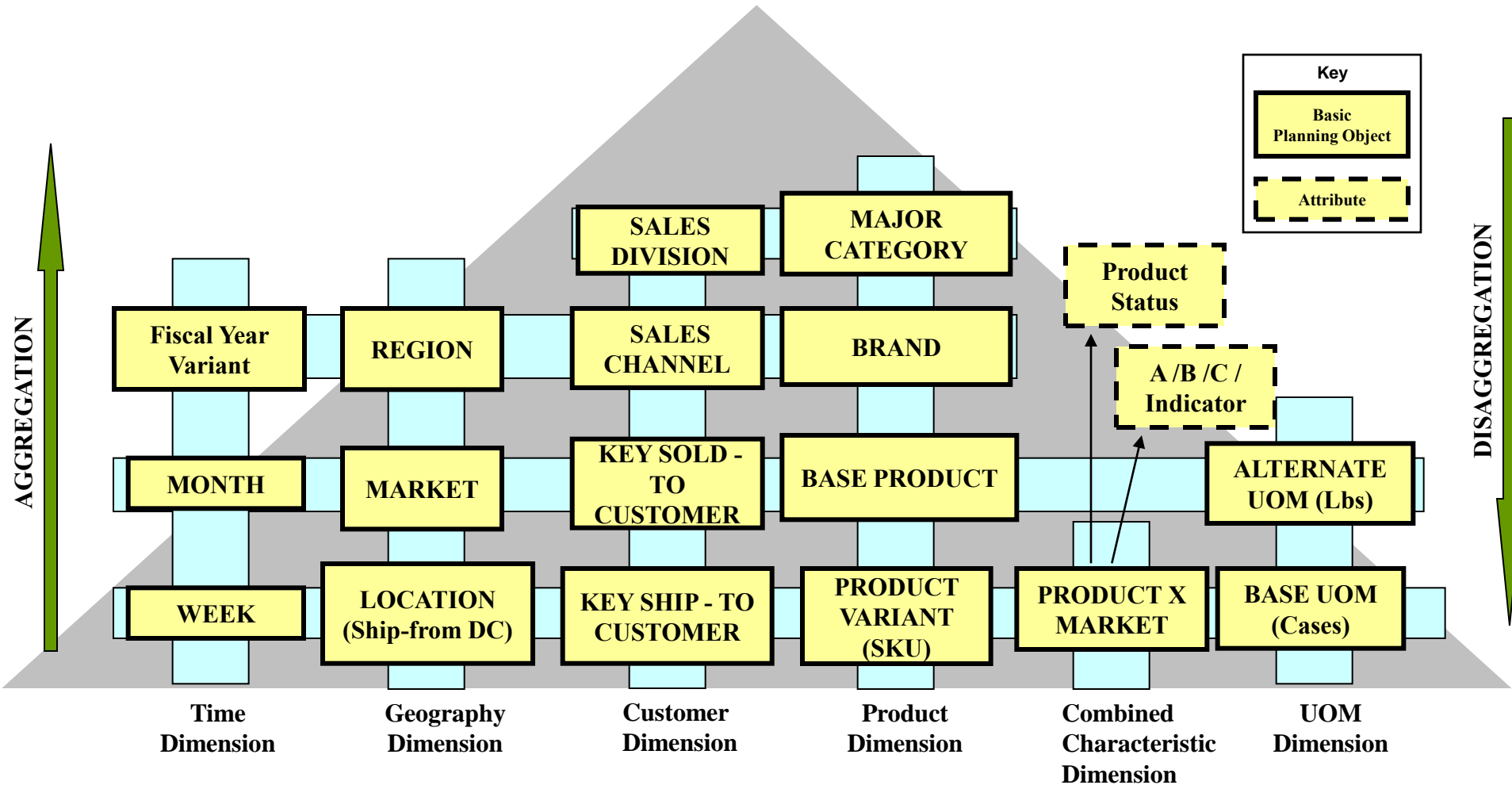
Publish Final Forecast

- Weekly or monthly Forecast release

SCM Demand Planning: Key Value Proposition

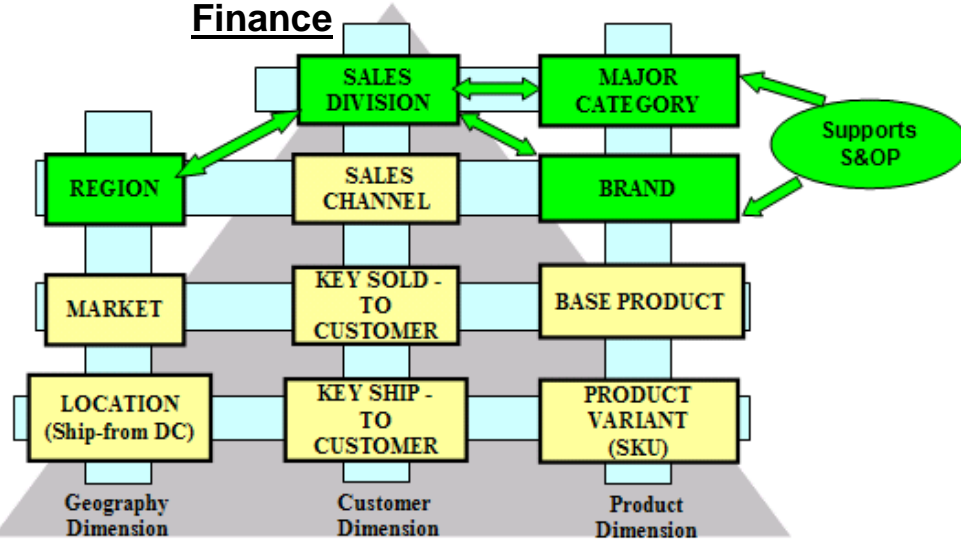
Value Proposition	Best Practices	Improvements
Integration and Visibility	<ul style="list-style-type: none"> Multi-dimensional Hierarchies Cross- functional Collaboration 	<ul style="list-style-type: none"> Quality of Forecast Demand Sensing and Shaping
Ease of Use	<ul style="list-style-type: none"> Interactive Planning Pick-best Statistical Modeling functions Alerts based Manage-by-exception process 	
Key Planning functions	<ul style="list-style-type: none"> De- promotionalize historical sales Promotional Planning Life Cycle Planning Consensus Forecast generation 	
S&OP Integration / Enabler	<ul style="list-style-type: none"> Integrated with budget and financial planning 'What-if' scenario analysis 	

Multi Dimensional Planning Hierarchy in SCM

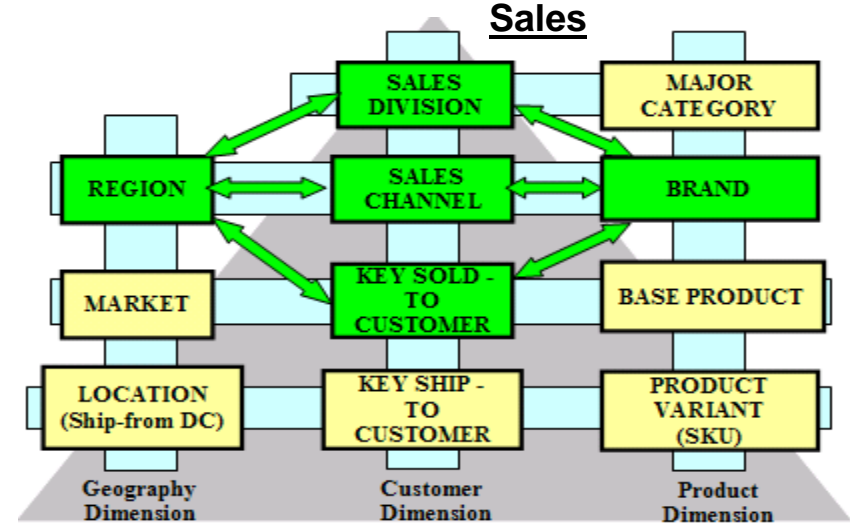


Multi-dimensional Hierarchies Enable Planning for all Functions in a Single Tool

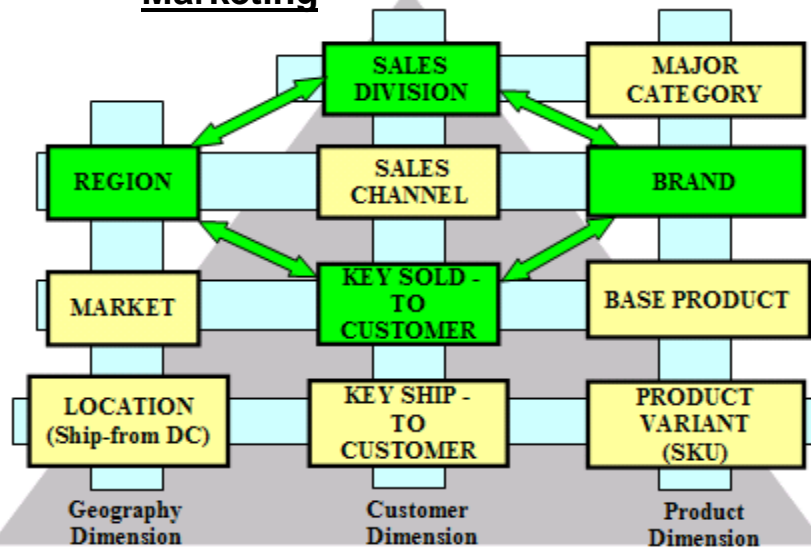
Finance



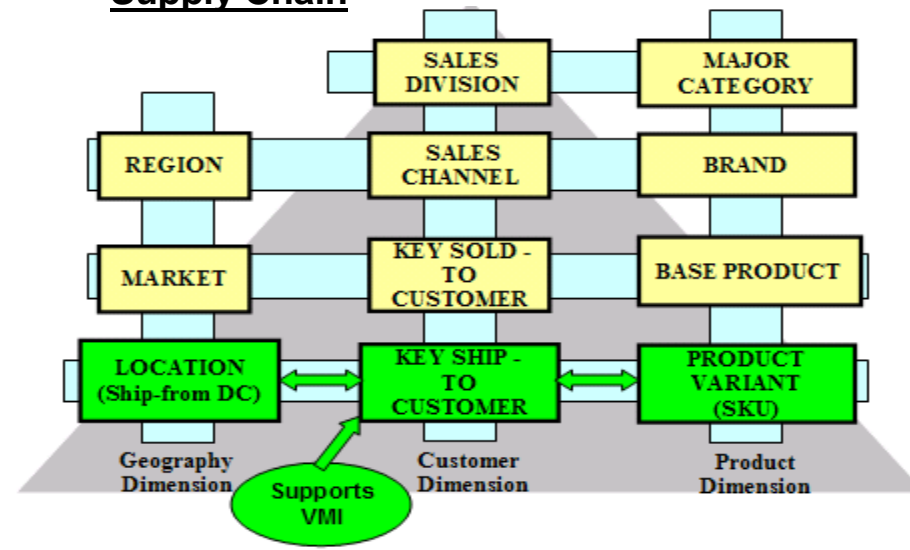
Sales



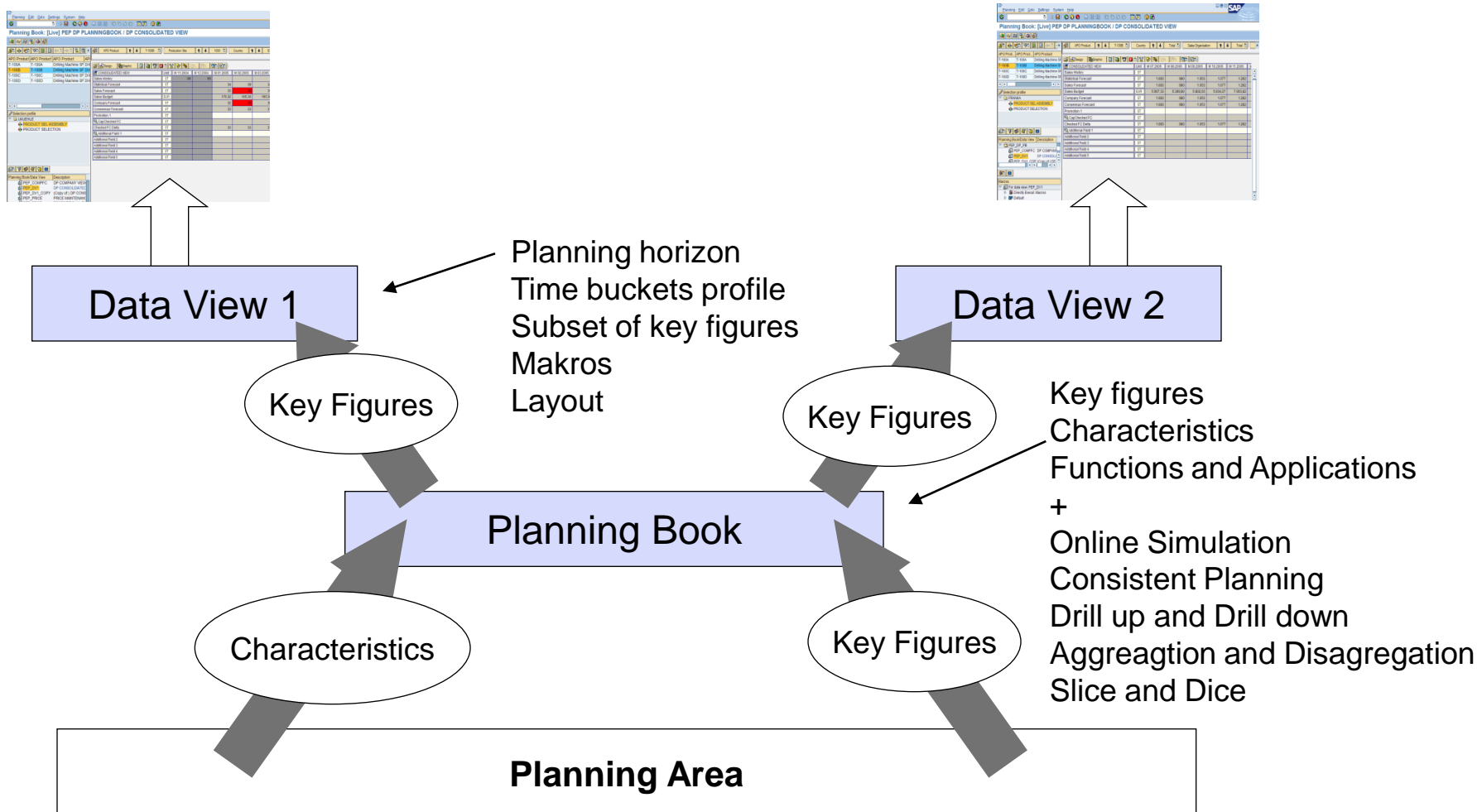
Marketing



Supply Chain



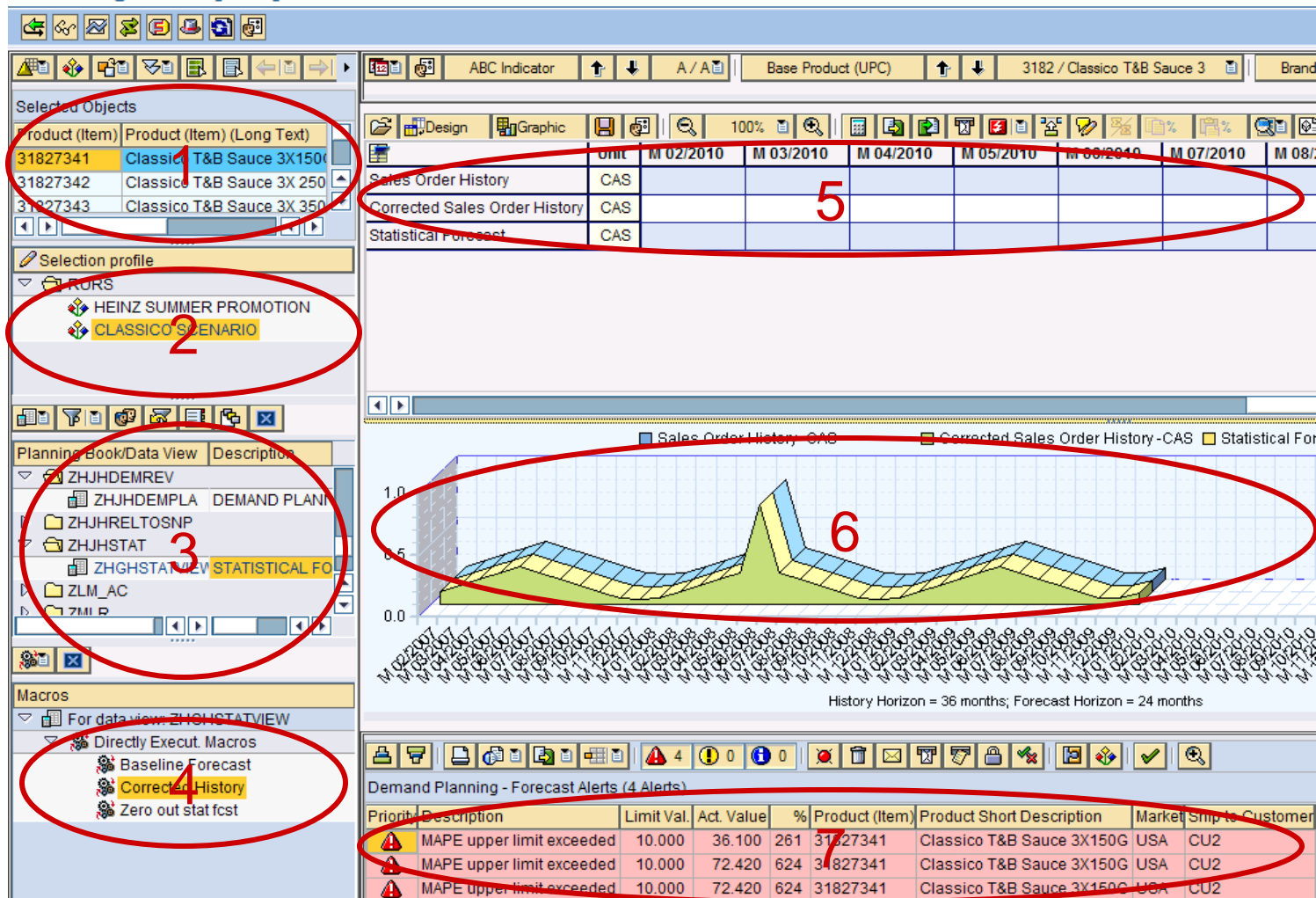
Planning Books and Data Views



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Interactive Planning Table – Portlet for all Information

Planning Book: [Live] BASELINE FORECAST / STATISTICAL FORECAST VIEW



1. Select and load planning objects
2. Group planning objects
3. Select Planning book/ Data view
4. Macro calculation
5. Tabular and Graphical display of data
- 6-7. Alerts

Advanced Statistical Analytics Capabilities in a Single Package

- 25+ univariate forecasting models
- Causal and Composite forecasting model
- Planner specific exception tolerances
- Ease of forecast parameter adjustments
- 'Pick-best' options

Advanced Statistical Analytics Capabilities provides Multiple 'Pick – Best' Forecast Modeling Options

<u>Options</u>	<u>Functionalities</u>
1: Auto Model 1	<ul style="list-style-type: none"> Evaluates trend, seasonality, sporadicity etc against the set parameter thresholds and generates the best forecast
2: Auto Model 2	<ul style="list-style-type: none"> Evaluates the forecast error by changing parameter combinations in small steps and picks the least error parameter numbers
3: Composite – Lowest Error	<ul style="list-style-type: none"> Evaluates a set of user defined models and picks the best model based on the lowest error
4: Composite – Weighted Average	<ul style="list-style-type: none"> Adds the results of different models based on user supplied set weights to come up with a final number

Option 1 and Option 2 can be used in combination with the other 2 options

Product Life Cycle Planning

Like modeling with Phase in & Phase out for a product line extension:

New product = Instant Adhesive CA4 (New)

Current Month = 02/2010

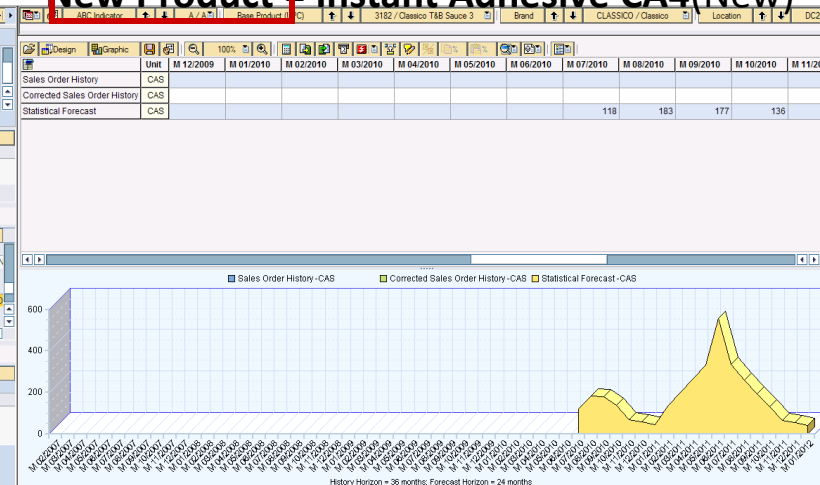
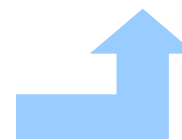
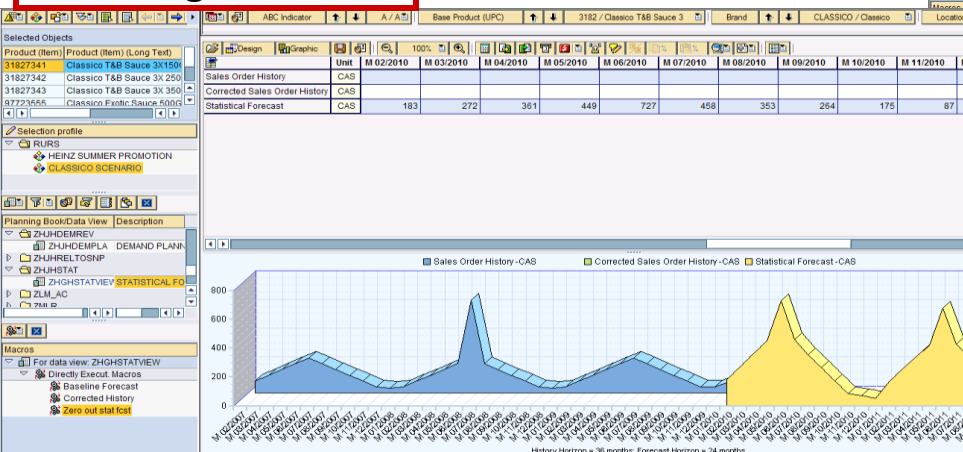
Phase in date of new product = 07/2010

Phase out date of new product = 12/2011

Existing/ Like product = Classico T&B Sauce 3x150G

Existing/ Like Product = Instant adhesive CA40

New Product = Instant Adhesive CA4(New)



Combination of multiple existing products can be used to like model the new product.

Real time Aggregation & Disaggregation ensures consistent data at all Hierarchical Levels



- Allows running statistical forecast at multiple levels
- Automated History driven proportions for updating DC level forecast
- Enables Top-down & bottom-up planning

Data aggregated to higher planning level
(Base Product – Sold to Customer)

Data entered at
**Lowest
planning level
(Item- Ship to
Customer level)**

Disaggregation Supports Top-down Planning

Planning Book: [Live] DEMAND REVIEW BOOK / DEMAND PLA

Selected Objects	
Base Product (UPC)	Base Product (UPC)
000000000000000003182	Classico T&B Sauce 3
000000000000000009772	Classico Exotic Sauce

Product (Item)	Unit	M 02/2010
Demand Planner Forecast	CAS	600

Data entered at

**Higher planning level
(Base Product – Sold
to Customer level)**

Planning Book: [Live] DEMAND REVIEW BOOK / DEMAND PLANNER VIEW

Selected Objects	
Base Product (UPC)	Base Product (UPC)
000000000000000003182	Classico T&B Sauce 3
000000000000000009772	Classico Exotic Sauce

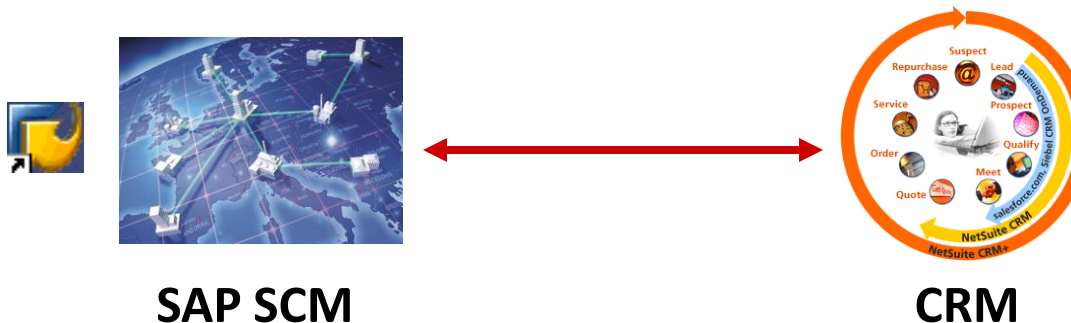
Product (Item)	Ship to Customer	Unit	M 02/2010
Total	Total	CAS	600
31827341 / Classico T&B Sauce 3X150G	Total	CAS	120
	CU2 / NY_Burger King WH	CAS	120
31827342 / Classico T&B Sauce 3X 250G	Total	CAS	120
	CU1 / IL_WALMART DC	CAS	120
31827343 / Classico T&B Sauce 3X 350G	Total	CAS	120
	CU2 / NY_Burger King WH	CAS	120
97723555 / Classico Exotic Sauce 500G	Total	CAS	120
	CU1 / IL_WALMART DC	CAS	120
97723556 / Classico Exotic Sauce 600G	Total	CAS	120
	CU2 / NY_Burger King WH	CAS	120

Data
disaggregated
to lowest
planning level
**(Item- Ship to
Customer
level)**

Promotional Planning in SCM

- Maintain all trade promotional programs (Ads., Displays, Demos and Slotting)
- Maintain different statuses for a promotion.
- Controlled release of Promotions into the Demand Plan
- Model cannibalization due to promotion
- Supports promotion related data analytics

Trade Promotion Data can be integrated between SCM and CRM



DePromotionalizing History

<u>Options</u>	<u>Functionalities</u>
1: Automated Outlier Correction	<ul style="list-style-type: none"> Once the tolerance is set, no user intervention required Capability to control specific historical events Flexible outlier correction tolerance to get desired baseline
2: Manual History Correction	<ul style="list-style-type: none"> Can make ad-hoc history corrections Can over-lay demand planner intelligence
3: Remove planned promotions from sales history	<ul style="list-style-type: none"> Flexibility to generate statistical forecast with/without past promotional impact on history Can differentiate amongst different types of promotions
4: Flag Price Based Promotions	<ul style="list-style-type: none"> Sales history with discounts, mark-downs etc can be flagged as it gets loaded from ERP system and can appropriately be de-promoted

Any combination of these options can be deployed at the same time

Univariate Forecasting

Constant:

Demand varies very little from a stable mean value

Moving Average Model

Weighted moving average

Trend:

Demand falls or rises constantly over a long period of time with only occasional deviations

First-order exponential smoothing

Second-order exponential smoothing

Seasonal demand:

Periodically recurring peaks and troughs differ significantly from a stable mean value

Seasonal model based on Winters' method

Seasonal linear regression

Seasonal trend:

Periodically recurring peaks and troughs, but with a continual increase or decrease in the mean value

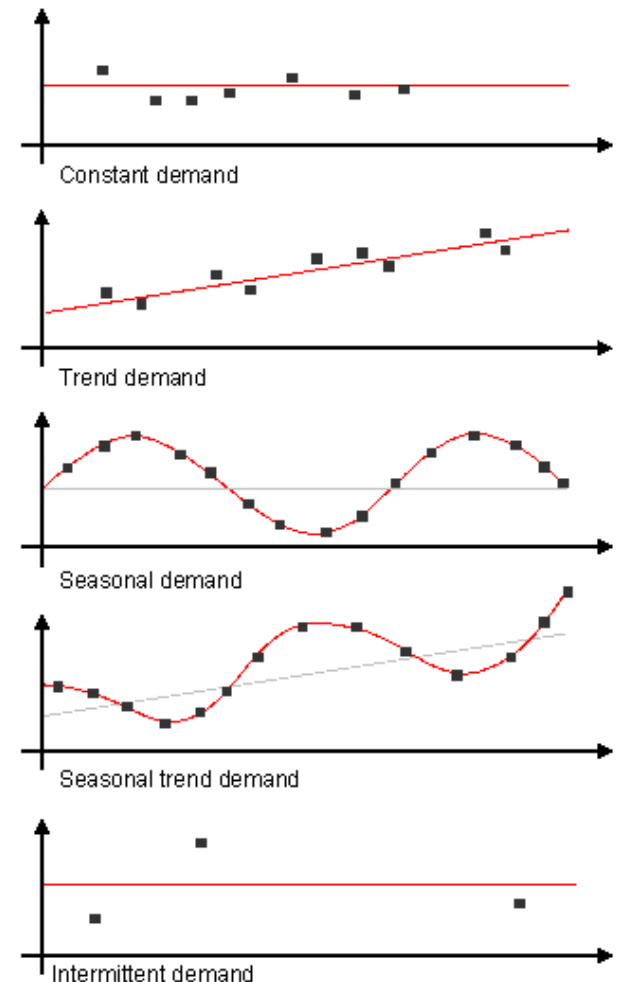
First-order exponential smoothing

Second-order exponential smoothing

Intermittent demand:

Demand is sporadic

Croston Method



Causal Analysis

Causal Analysis is an approach to evaluate whether a selected independent variable like prices, budgets, campaigns, weather temperature explains changes in the independent variable demand.

Multiple linear regression (MLR) is a statistical technique that is used by SAP SCM to analyze the relationship between a single dependent variable and several independent variables.

The objective of multiple regression analysis is to use the independent variables whose values are known in the past and can be projected into the future to predict the future values of the single dependent variable.

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3...b_nX_n + e_i$$

R square indicates how well a particular combination of X variables explains the variation in Y.

Y = Dependent variable

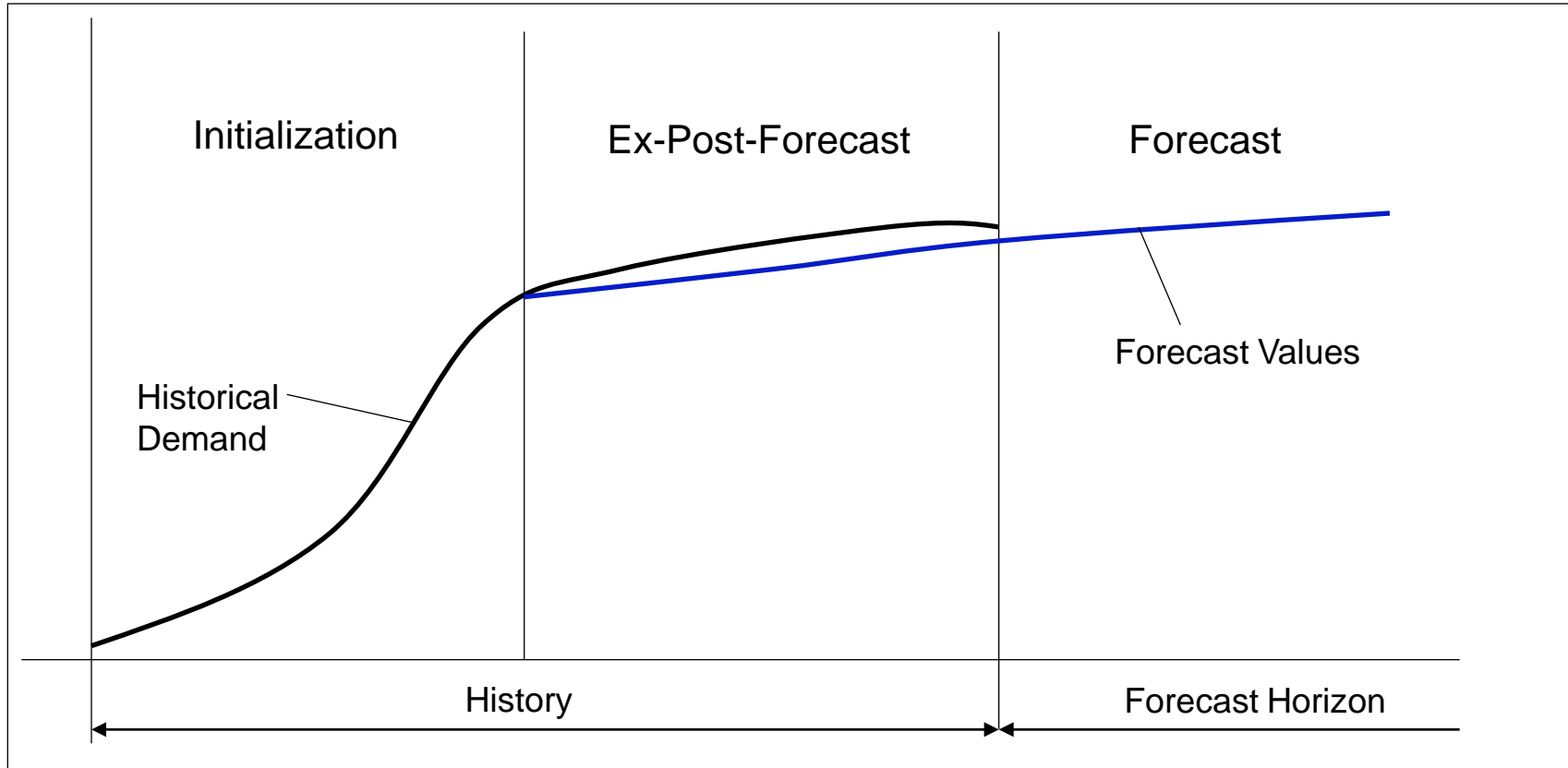
b_0 = Y intercept or constant

b_i = Coefficients or weights

X_i = Independent variables

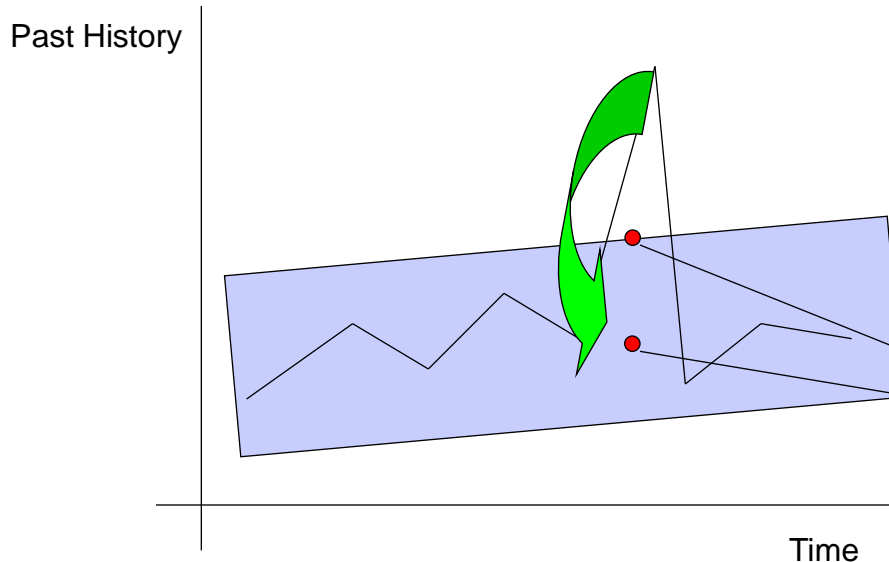
e_i = Residual or prediction error

Ex-Post-Forecast



Ex-Post-Forecast is calculated for past periods for which actual demand history is also available. Forecast Accuracy can be improved by applying this procedure to demand history.

Outlier Correction



Ex-Post Method

In this method the system uses the ex-post forecast to determine a tolerance lane. If a historical value lies outside this tolerance lane, the system views it as an outlier and corrects it.

Depending on the customization the system corrects the value to either the ex-post value or the nearest boundary of the tolerance lane.

Median Method

The system uses the median method to determine the ex-post forecast values for the basic value, trend value, and the seasonal index. It can thus calculate an expected value for each historical period

Forecast Accuracy Measurements

Univariate Forecast Errors

- Mean absolute deviation (MAD)
- Error total (ET)
- Mean absolute percentage error (MAPE)
- Mean square error (MSE)
- Square root of the mean squared error (RMSE)
- Mean percentage error (MPE)

The system calculates the forecast errors by comparing the differences between the Actual values and the Ex-Post values.

Measures of Fit - Multiple Linear Regression Model

- R square
- Adjusted R square
- Durbin-h
- Durbin-Watson
- T-test
- Mean elasticity

Using these measurements will allow to improve the accuracy of forecasts by monitoring predefined tolerance thresholds and by adjusting the forecast model where any of these thresholds are exceeded.

Consensus Forecast – One Number Forecast in a Single Tool

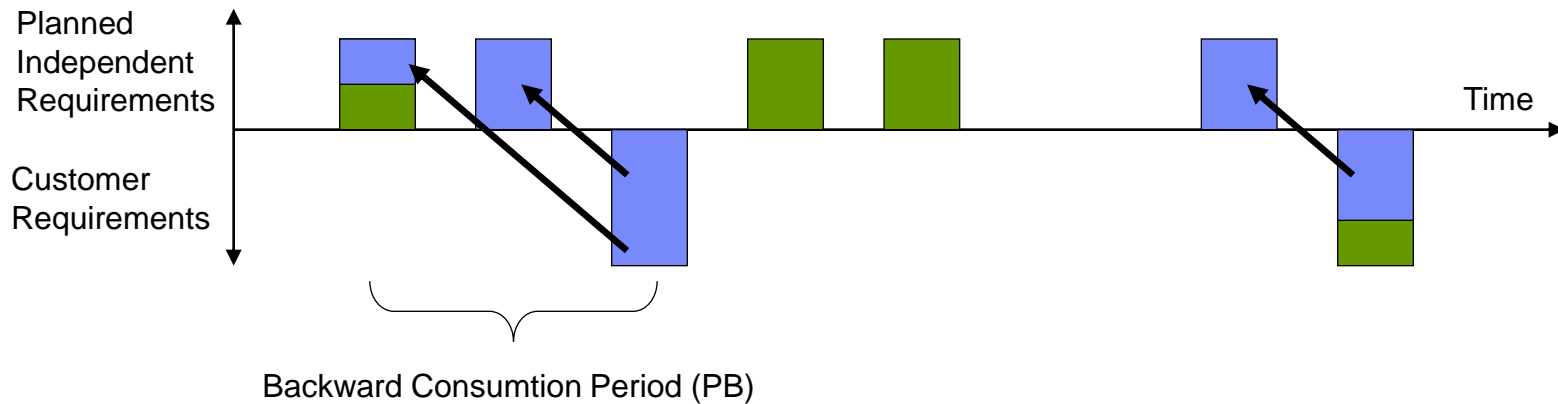
Demand Review Meeting



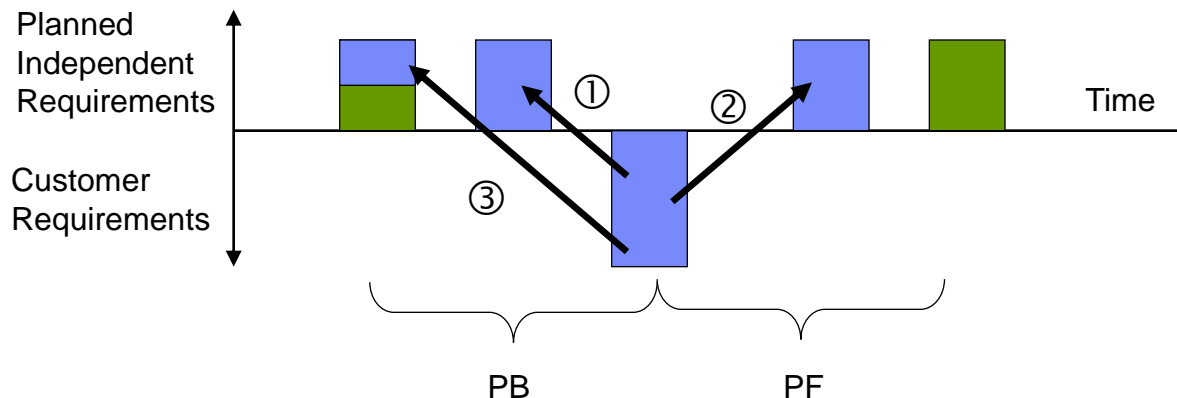
...while still maintaining complete ownership, accountability, and data security of the numbers

Forecast Consumption (“Forecast Netting”)

Backward Consumption only (Forward Consumption only works in the same way)

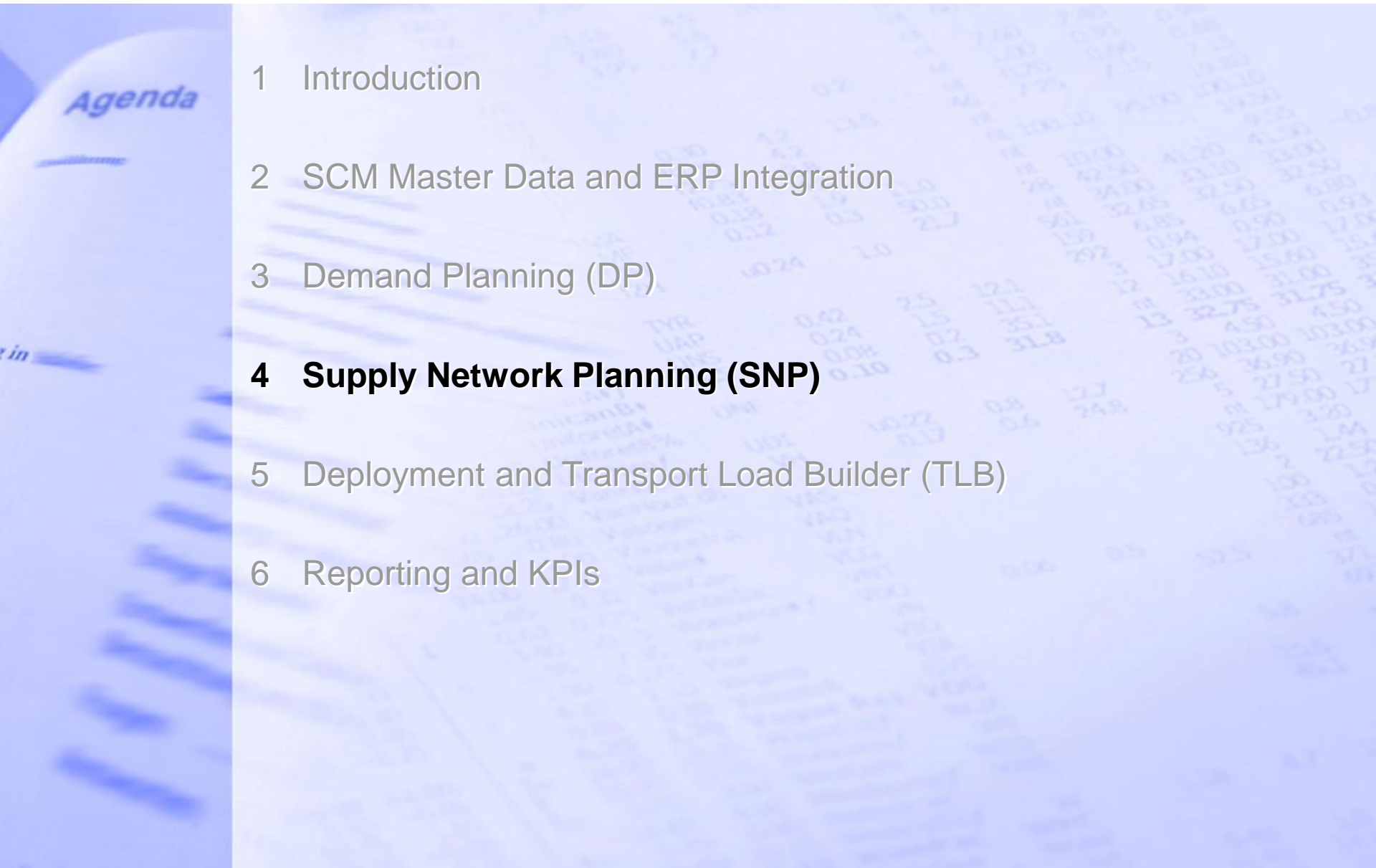


Backward and Forward Consumption



SAP ERP SOP - Missing Functionality

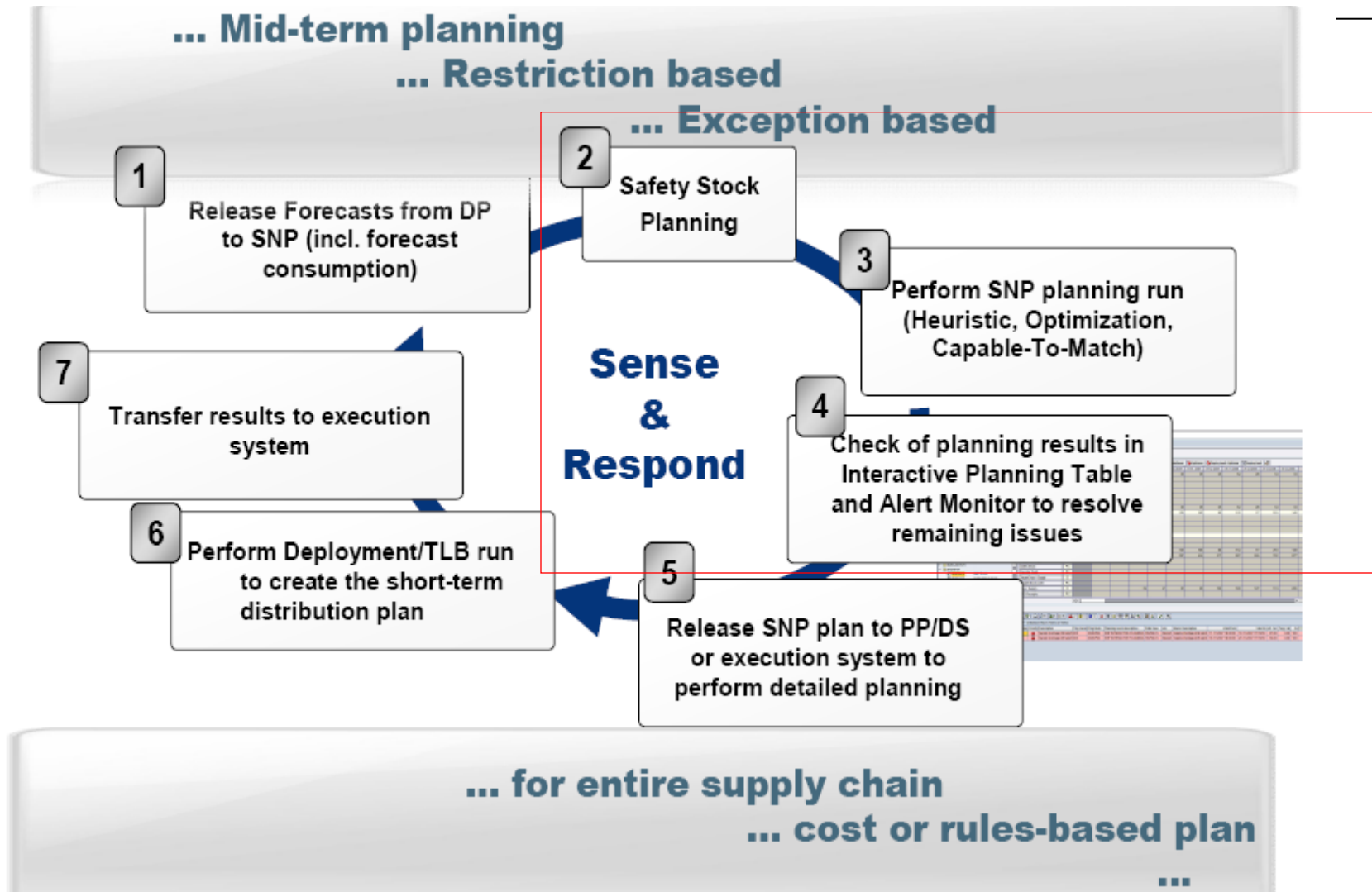
- Only one period type is supported at the same time therefore no time-based disaggregation possible
- Only limited Forecast Models available
- Only limited Forecast Accuracy Measurements available
- Only limited Automatic Model Selection functionality available
- No Lifecycle Planning available
- No Causal Analysis available
- No Promotion Planning available
- Insufficient methods for consolidating and validating complex demand plans
- No Collaborative Planning possible
- No Exception based Management supported / No Alert Monitor available
- No Central Memory based Planning available

- 
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Supply Network Planning - Standard Functionality

- **Interactive Planning**
 - Adjustment & Reconciliation of supply plan
 - “What-if?” scenarios
- **Alerts**
 - Exception Based Management
 - Alert Monitor
- **Classical SNP- Functionalities**
 - Considering Limited Capacities
 - Identifying the Source of Supply
 - Consider Bill of Materials
- **Planning and Optimization Tools**
 - Heuristic
 - Capable to Match (CTM)
 - Deployment
 - Constraint and cost based Optimization
 - Transport Load Building
 - Vendor Managed Inventory
- **Integration**
 - Feed of information from SAP R/3
 - Feed of data from Legacy systems
 - Transfer of Plans to R/3
 - Procurement, Production, Distribution and Transport
- **Reporting**
 - Availability of data for data warehouse solution
 - Download planning results to .xls

SNP Planning Cycle – typical and optional workflows



2. SNP Safety Stock Calculation Methods

Basic Methods

1. **SB** Safety stock from location product master
2. **SZ** Safety days' supply from location product master
3. **SM** Maximum from SB and SZ
4. **MB** Safety stock (time-based maintenance)
5. **MZ** Safety days' supply (time-based maintenance)
6. **MM** Maximum from MB and MZ (time-based maintenance)

Advanced Methods

7. **AT** α – service level and reorder cycle method
8. **AS** α – service level and reorder point method
9. **BT** β – service level and reorder cycle method
10. **BS** β – service level and reorder point method

2. SNP Safety Stock Calculation

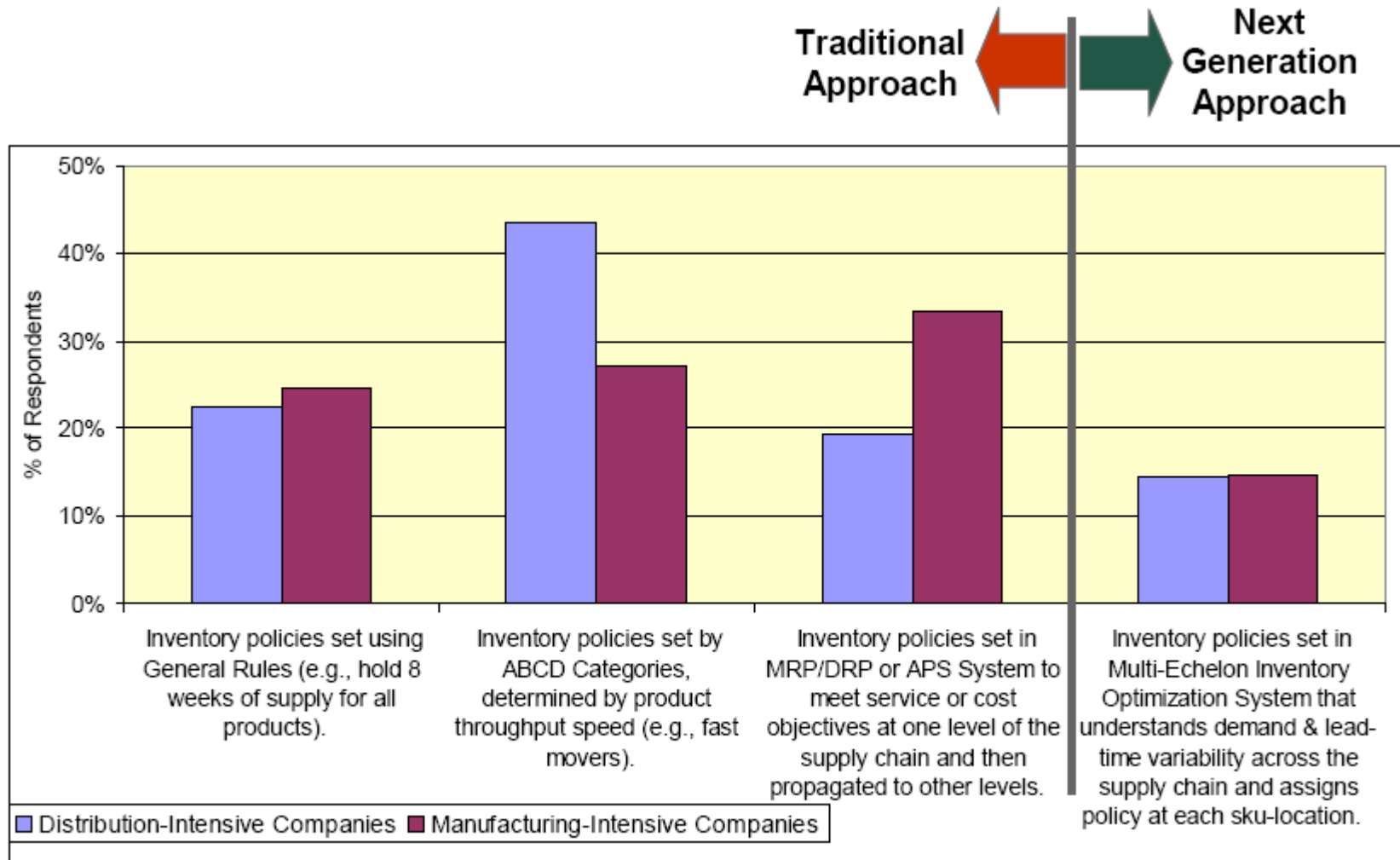
Planning Book: [Live] SNP SAFETY STOCK PLANNING / SNP PLAN (SSP)

Product	Ty	Locati	Prod Desc	Loc. description	Unit	Initial	29.09.2006	30.09.2006	01.10.2006	02.10.2006	03.10.2006	04.10.2006	05.10.2006	06.10.2006	07.10.2006	08.10.2006
PROD01	DC02	Product 01	Distr. Center 02		PC											
PROD01	DC03	Product 01	Distr. Center 03		PC											
PROD01	DC04	Product 01	Distr. Center 04		PC											
PROD01	DC05	Product 01	Distr. Center 05		PC											
PROD01	DC06	Product 01	Distr. Center 06		PC											
PROD01	PL01	Product 01	Plant 01		PC											
PROD01	PL02	Product 01	Plant 02		PC											
SNP PLAN																
Total Demand						PC										
Distribution Receipt (Planned)						PC										
Distribution Receipt (Confirmed)						PC										
Distribution Receipt (TLB-Confirmed)						PC										
In Transit						PC										
Production (Planned)						PC	896									
Production (Confirmed)						PC										
Manufacture of Co-Products						PC										
Total Receipts						PC										
Stock on Hand						PC										
Supply Strategy						PC										
Safety Stock (Planned)						PC		45	45	45	41	41	41	41	41	41
Safety Stock (Confirmed)						PC										
Safety Stock						PC										
Reorder Point						PC										
Target Days' Supply						D										
Target Stock Level						PC										
Days' Supply						D										
ATD Receipts						PC	896									
ATD Issues						PC										

Minimum and maximum value for safety stock

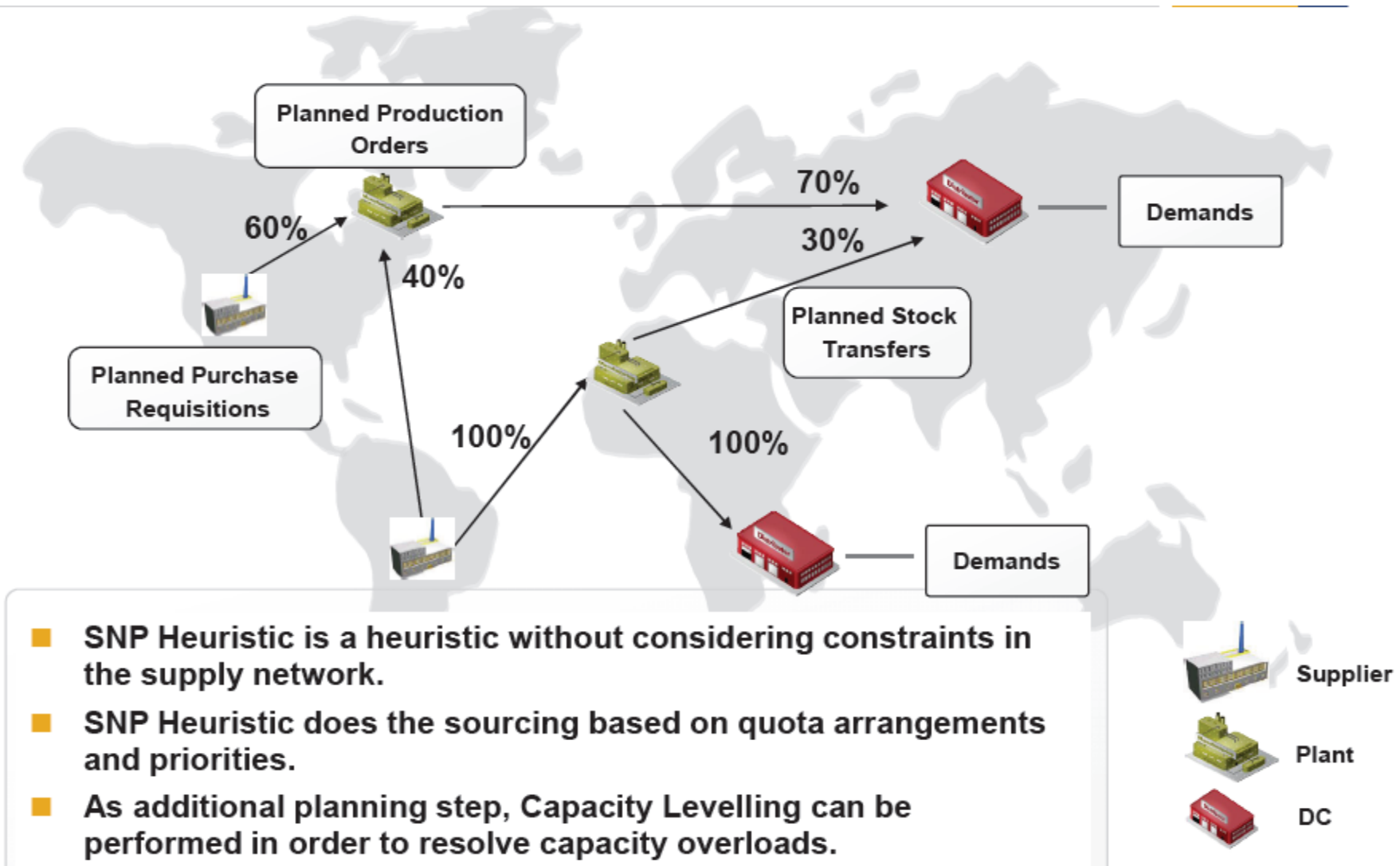
Stock Data		Safety Stock Method		AT	Min. SFT		40,000
Safety Stock		Service Level (%)	95,0		Max. SFT		45,000
Reorder Point		Demand Forecast Err. (%)					
Max Stock Level		RLT Forecast Error (%)		Replen. Lead Time			
Stock	10						

2.Inventory Policy Practices



Source: Aberdeen Group, 2004; Survey Results of 178 companies

3. SNP Planning Methods : SNP Heuristic



- **SNP Heuristic is a heuristic without considering constraints in the supply network.**
- **SNP Heuristic does the sourcing based on quota arrangements and priorities.**
- **As additional planning step, Capacity Levelling can be performed in order to resolve capacity overloads.**

3. SNP Heuristic Variants (1/2)

Location Heuristic

- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Interactive | <ul style="list-style-type: none"> ▪ Select one location-product ▪ One-level Heuristic for the selected product plans receipts |
| <ul style="list-style-type: none"> ▪ Batch | <ul style="list-style-type: none"> ▪ Select up to all location-products ▪ In background processing, possibility to plan secondary demands out of BOM explosion |

Network Heuristic

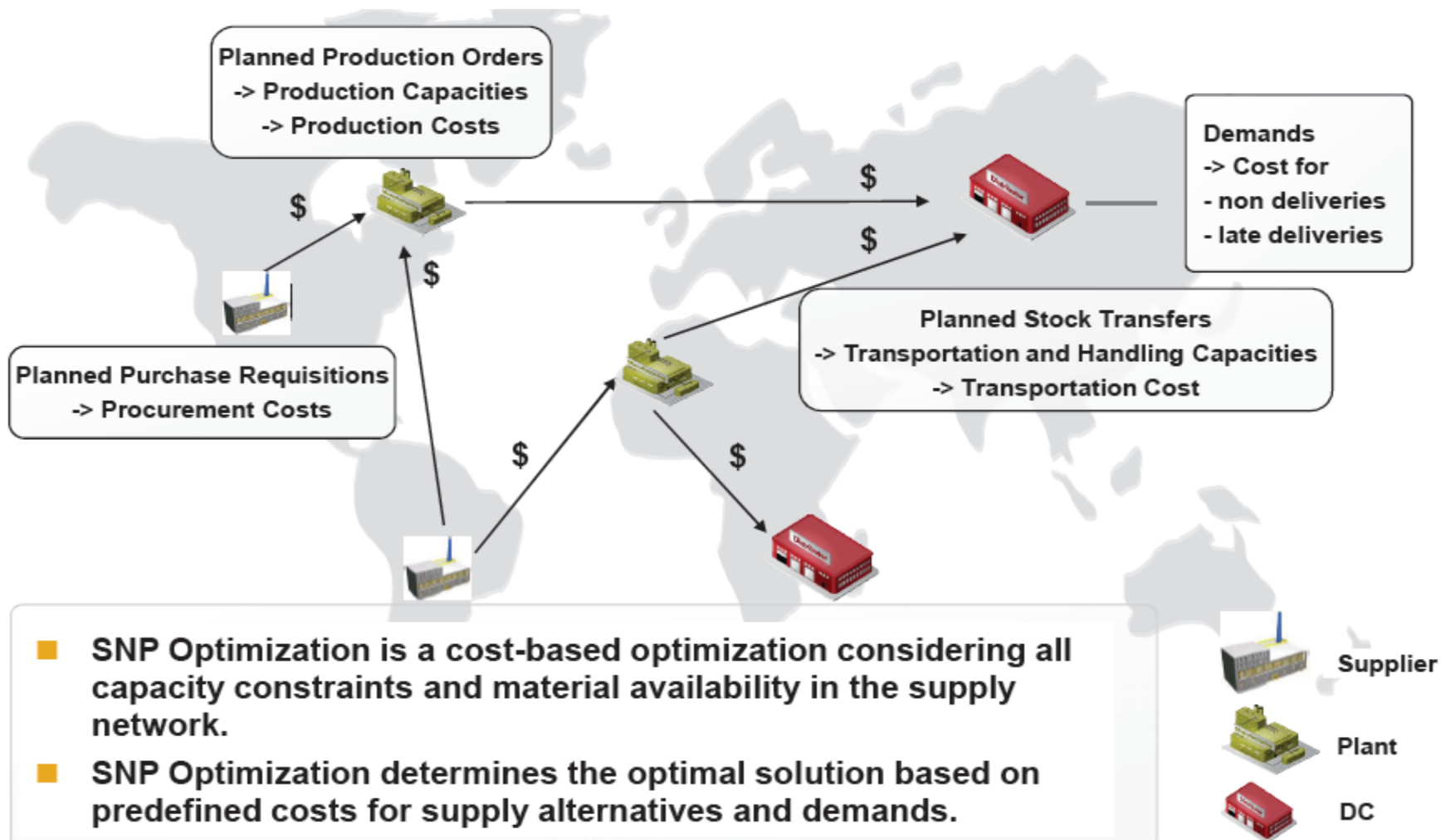
- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Interactive | <ul style="list-style-type: none"> ▪ Select one location-product ▪ All locations for the selected product will be planned (automatic sequence) |
| <ul style="list-style-type: none"> ▪ Batch | <ul style="list-style-type: none"> ▪ Select up to all location-products ▪ In background processing, possibility to plan secondary demands out of BOM explosion |

3. SNP Heuristic Variants (2/2)

Multi-Level Heuristic

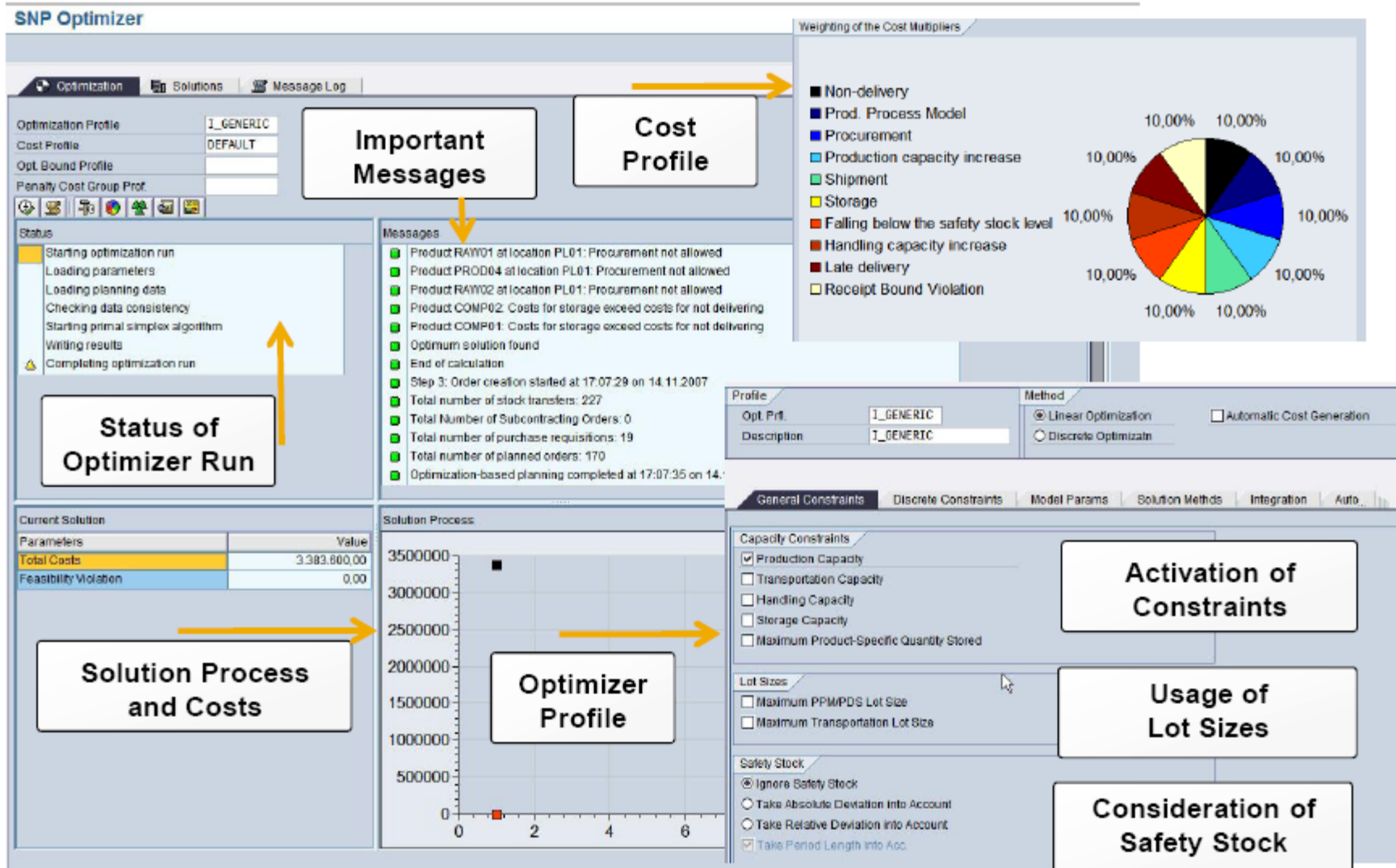
- Interactive
 - Select one location-product
 - All locations for the product will be planned (automatic sequence of locations)
 - BOM explosion caters for secondary demands of all components

3. SNP Planning Methods : SNP Optimization

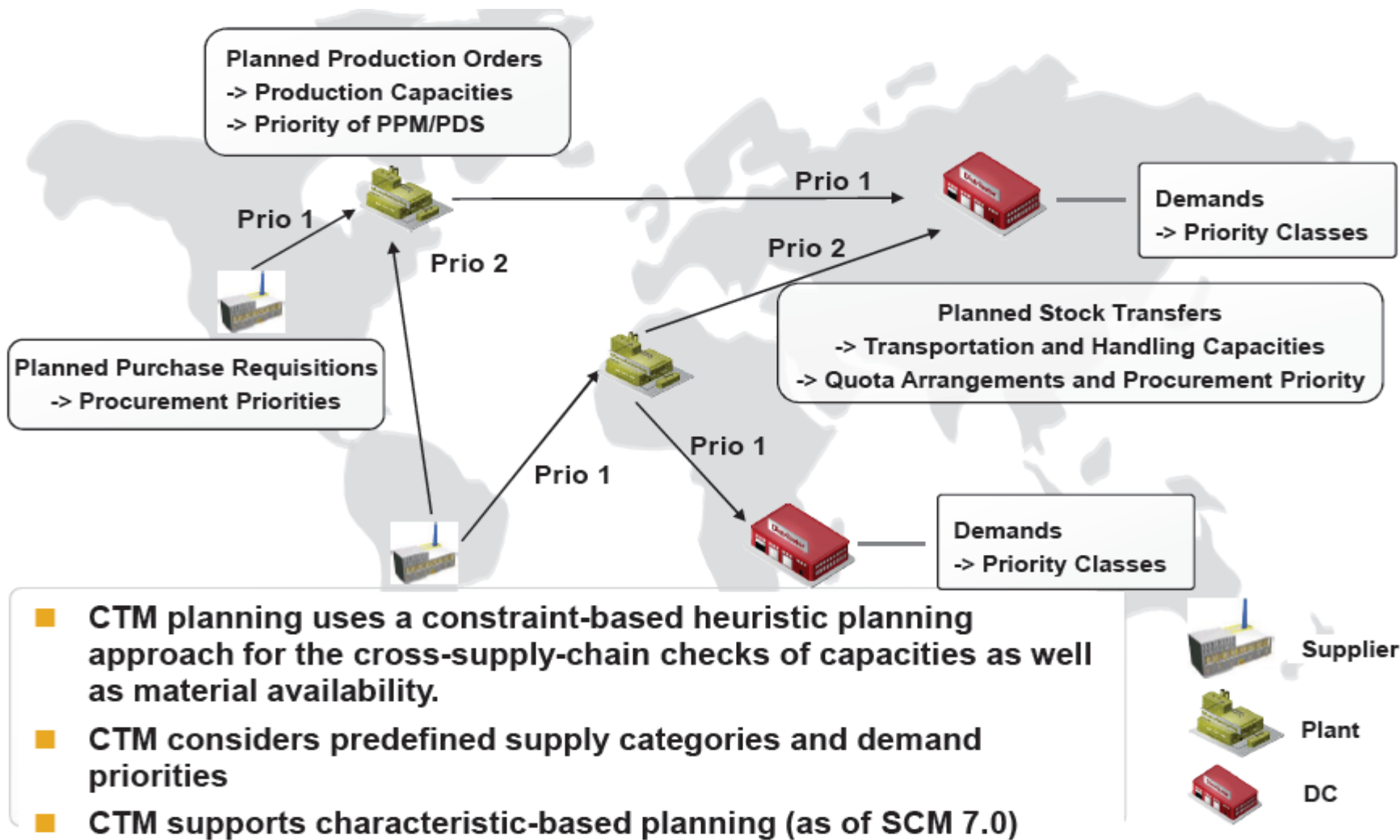


- **SNP Optimization is a cost-based optimization considering all capacity constraints and material availability in the supply network.**
- **SNP Optimization determines the optimal solution based on predefined costs for supply alternatives and demands.**

3. Algorithm : SNP Optimization



3. SNP Planning Methods : Capable to Match



- CTM planning uses a constraint-based heuristic planning approach for the cross-supply-chain checks of capacities as well as material availability.
- CTM considers predefined supply categories and demand priorities
- CTM supports characteristic-based planning (as of SCM 7.0)

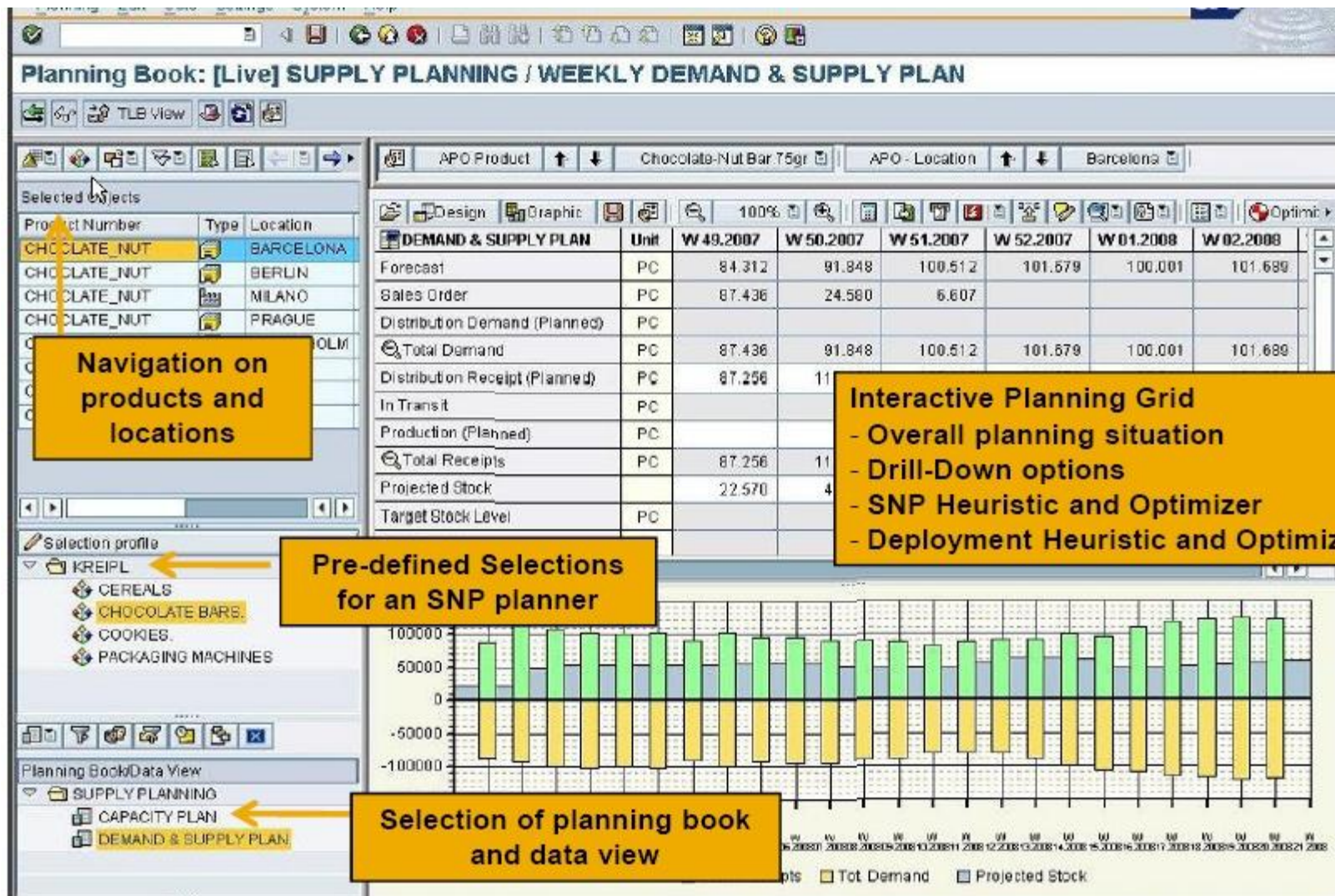
3. Comparison of the SNP Algorithms

	Heuristic	CTM	Optimizer
Capacity	Infinite	Finite	Finite
Resources	Only by additional step Capacity Levelling: Production Transportation Handling	Production Transportation Handling	Production Transportation Handling Storage (distinction between standard and extended capacity)
Minimum Resource Utilization	Not considered	Not considered	Supported for production resources
Sourcing	Based on quota arrangements and priorities	Based on costs (PPM/PDS and transportation), priority, or quota arrangements	Based on costs and can also consider quota arrangements

3. Comparison of the SNP Algorithms Contd

	Heuristic	CTM	Optimizer
Lot Sizes	Considers lot sizes for production, transportation, and procurement	Considers lot sizes for production, transportation, and procurement	Considers lot sizes for production and transportation; considers cross-period lot sizes for production
Aggregated Planning	Supported	Supported	Supported
Maximum Stock Levels by Product	Not considered	Not considered	Considered as a constraint
Push Distribution Stock to Downstream Locations	Not supported (but supported by deployment)	Supported by Supply Distribution (and supported by deployment)	Can be controlled by using storage costs

4. Planning Book – A One Stop tool for Supply Planner



4. Interactive Planning Book – Capacity View

Planning Book: [Live] SNP INTERACTIVE PLANNING / CAPACITY CHECK

Selected Objects

Type	Resource	Location
	W01_PL01_001	PL01
	W01_PL02_001	PL02
	W02_PL01_001	PL01
	W02_PL02_001	PL02
	W03_PL01_001	PL01
	W03_PL02_001	PL02
	W04_PL01_001	PL01
	W04_PL02_001	PL02
	W01_PL02_002	PL02

Selection profile

- HEISIG
- LGENSE DC_OPT
- LGENSE DC

Navigation on resources

Visualization of resource overload

Planned production orders on resource

Alerts for resource load

Capacity PLAN

Unit	W 46 2007	W 47 2007	W 48 2007	W 49 2007	W 50 2007	W 51 2007	W 52 2007	W 01 2008	W 02 2008	W 03 2008	W 04 2008	W 05 2008
Capacity	H	112	112	112	112	112	112	112	112	112	112	112
Normal Available Capacity	H	112	112	112	112	112	112	112	112	112	112	112
Maximum Available Capacity	H	112	112	112	112	112	112	112	112	112	112	112
Minimum Available Capacity	H											
Capacity Consumption	H			504	182	182	181	187	186	187	186	192
Resource Capacity Level in %	%			530	163	162	182	167	166	167	166	171

QUANTITY VIEW

Unit	W 46 2007	W 47 2007	W 48 2007	W 49 2007	W 50 2007	W 51 2007	W 52 2007	W 01 2008	W 02 2008	W 03 2008	W 04 2008	W 05 2008
(Total)	PC			1,186	363	362	361	373	371	372	371	382
(Planned)	PC			1,186	363	362	361	373	371	372	371	382
of Co-Products	PC											

Planning Book/Data view

- 9ASNP94
 - SNP94(1) SNP PLAN
 - SNP94(2) CAPACITY CHECK
 - 9ASNP94_BATCH
 - 9ASNP94_INTERAC
 - 9ASNPAGGR
 - 9ASNPBDC
 - 9ASNP_PS
 - 9ASNP_SHLF
 - 9ASNP_SSP
 - 9ASNP

Macros

- For data view: SNP94(2)
 - Directly Execut. Macros
 - Resource load 100% (DB alert)
 - Resource load 100% (dynamic alerts)
 - Resource overload (DB alert)
 - Resource overload (dynamic alerts)
 - Resource underload (DB alert)
 - Resource underload (dynamic alerts)

SDP - Database Macro Alerts (1 Alerts)

Status	Priority	Description	Ping Versn	Ping Book	Planning book description	Data View	Job	Macro Description	Valid from	Valid to	Act. Val.	Targ. Val.	%
		Resource overload in bucket (DB alert)	000	9ASNP94	SNP INTERACTIVE PLANNING	SNP94(2)	Interact	Resource overload (DB alert)	25.11.2007 00:00:00	02.12.2007 23:59:59	503.91	112.00	439

4. Interactive SNP Planning Book – Exception Based Management

Planning Book: [Live] SNP INTERACTIVE PLANNING / SNP PLAN

APG - Location: DC02 | APO Product: PRO001

Selected Objects

Product	Type	Locality	Prod. Description	Loc. description
COMP01	FL01	Component 01	Plant 01	
COMP01	FL02	Component 01	Plant 02	
COMP02	FL01	Component 02	Plant 01	
COMP02	FL02	Component 02	Plant 02	
PR0001	DC01	Product 01	Distr. Center 01	
PR0001	DC02	Product 01	Distr. Center 02	
PR0001	DC03	Product 01	Distr. Center 03	
PR0001	DC04	Product 01	Distr. Center 04	

Selection profile

- HEISIGG
 - L_GENERIC_OPT
 - L_GENERIC

Planning Book Data View

- 9ASAS
- 9ASAS_BATCH
- 9ASNP94
 - SNP94(1) SNP PLAN
 - SNP94(2) CAPACITY CHECK
- 9ASNP94_BATCH
- 9ASNP94_INTERAC
- 9ASNPAGGR
- 9ASNP94SBC
- 9ASNP_P9
- 9ASNP_SHIF

Macros

- For data view: SNP94(1)
 - Directly Execut. Macros
 - Stock below safety stock (DB alert)
 - Stock below safety stock (dyn. alerts)
 - Stock below target stock (DB alert)
 - Stock below target stock (dyn. alerts)
 - Supply shortage (DB alert)
 - Supply shortage (dynamic alerts)

Design | Graphic | Location | Network | Multilevel | Optimizer | Deployment Optimizer | Deployment

	Unit	W 46 2007	W 47 2007	W 48 2007	W 49 2007	W 50 2007	W 51 2007	W 52 2007	W 01 2008	W 02 2008	W 03 2008	W 04 2008
SNP PLAN	INITIAL											
Forecast	PC	27	27	28	28	28	28	28	32	28	34	34
Sales Order	PC											
Distribution Demand (Planned)	PC											
Distribution Demand (Confirm ...)	PC											
Distribution Demand (TLB-Co ...)	PC											
Dependent Demand	PC											
Total Demand	PC	27	27	28	28	28	28	28	32	28	34	34
Distribution Receipt (Planned)	PC			192	115	128	183	89	112	17	210	149
Distribution Receipt (Confirms ...)	PC											
Distribution Receipt (TLB-Con ...)	PC											
In Transit	PC											
Production (Planned)	PC											
Production (Confirmed)	PC											
Manufacture of Co-Products	PC											
Total Receipts	PC			192	115	128	183	89	112	17	210	149
Stock on Hand	PC			110	199	297	454	517	597	586	782	877
Supply Shortage	PC	27	54									
Safety Stock	PC											
Reorder Point	PC											
Target Days' Supply	D											
Target Stock Level	PC											
Days' Supply	D			29	47	65	96	109	128	127	174	206
ATD Receipts	PC											

Alerts for Supply Shortages

SCP - Database Macro Alerts (2 Alerts)

Status	Priority	Description	Ping versn	Ping Book	Planning book description	Data View	Job	Macro Description	Valid from	Valid to	Act. val	Targ. Val	% P
		Supply shortage (DB alert)	000	9ASNP94	SNP INTERACTIVE PLANNING	SNP94(1)	Interact	Supply shortage (DB alert)	11.11.2007 18:00:00	18.11.2007 17:59:59	27.00	0.00	100
		Supply shortage (DB alert)	000	9ASNP94	SNP INTERACTIVE PLANNING	SNP94(1)	Interact	Supply shortage (DB alert)	18.11.2007 18:00:00	25.11.2007 17:59:59	54.00	0.00	100

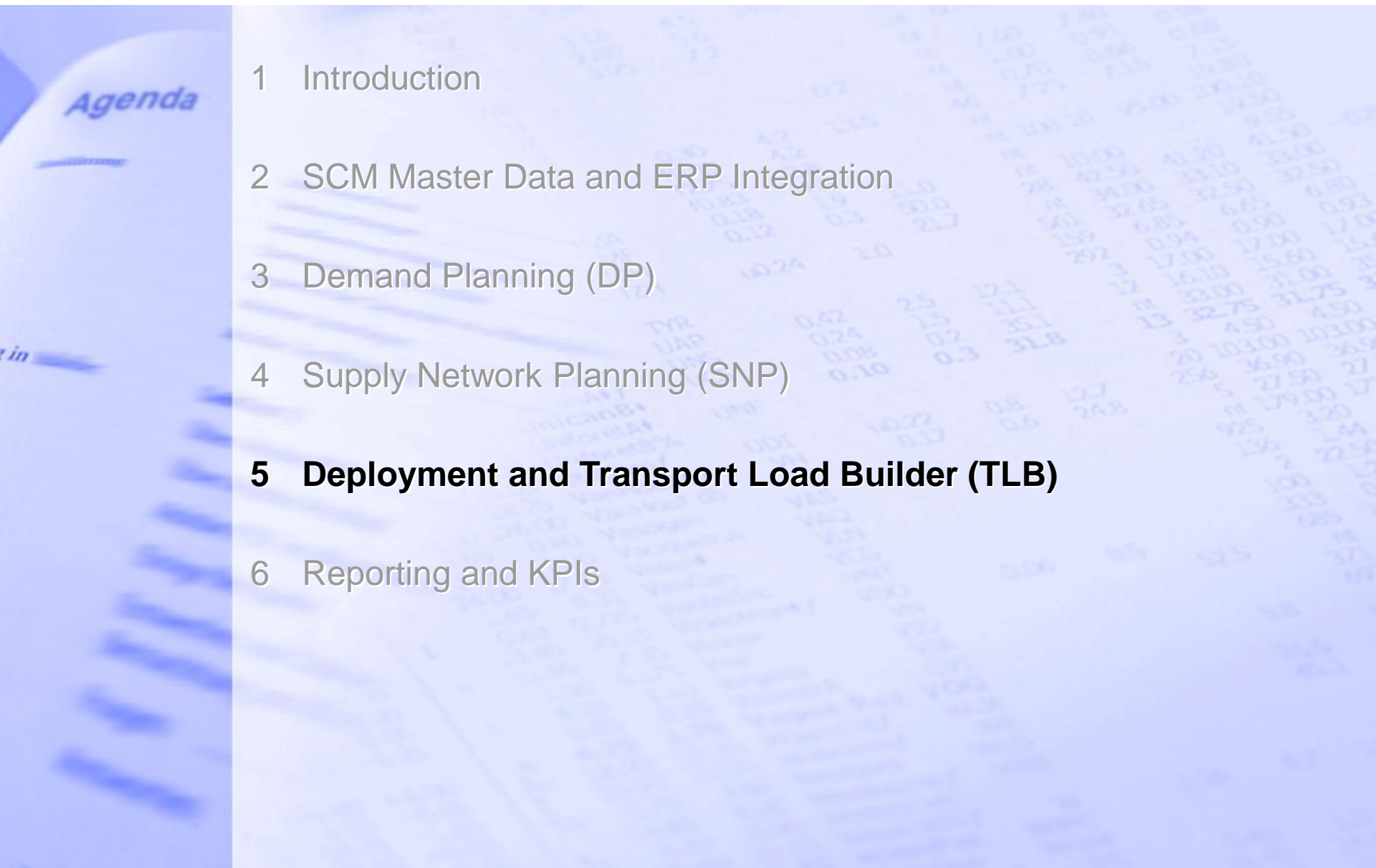
SNP planner can alternatively also drill-down from the alert monitor to the application to solve the issue.

3. Comparison of the SNP Algorithms Contd

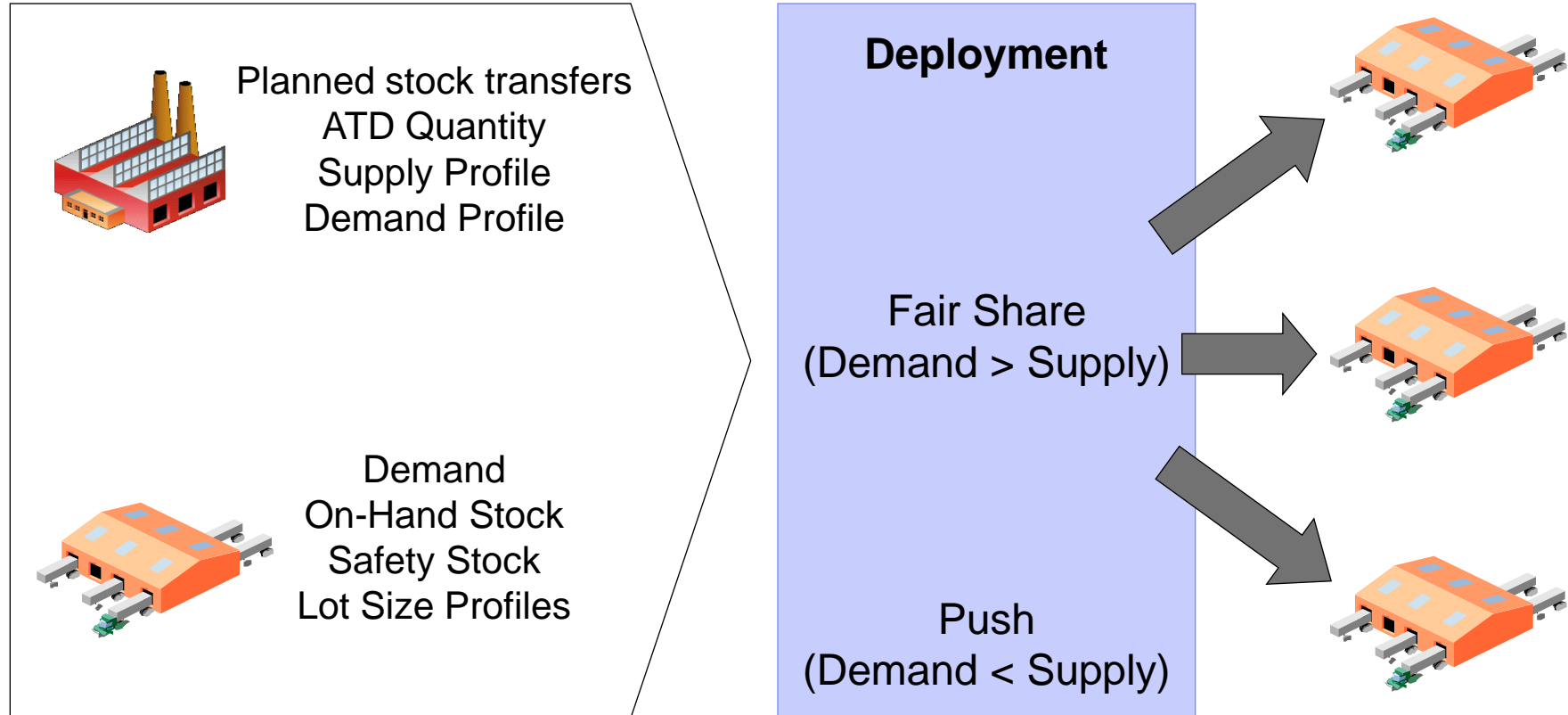
	Heuristic	CTM	Optimizer
Demand Prioritization	Not supported	Demand can be sorted by different sort criteria	Demand can be distinguished for three demand classes
Shelf Life	Not considered in planning run, but considered in shelf life propagation	Not considered in planning run, but considered in shelf life propagation	Can consider shelf life in a restricted way, considered in shelf life propagation
Scheduling Agreements Processing	Supported	Not supported	Not supported
Subcontracting	Supported	Supported	Supported
Net Change Planning	Supported	Supported	Supported

Comparison of MRP II (SAP R/3) and mySAP SCM

SAP R/3	SAP SCM
Planning Process	
<ul style="list-style-type: none"> ▪ Insufficient methods for consolidating and validating complex demand plans ▪ Medium Term „Quantity Planning“ in successive Planning levels. ▪ Capacity Planning: Only Manual alignment of capacity Overloads (Production Planning or production Control) ▪ Automatic Consideration of Alternative resources not possible. ▪ Set-Up Optimization not possible 	<ul style="list-style-type: none"> ▪ High-Performance, Consolidated Global Demand Plan <ul style="list-style-type: none"> ▪ Extensive Forecasting methods ▪ Supply Network Planning (Medium-Term) <ul style="list-style-type: none"> ▪ Quantity Planning, Capacity Alignment, priority based planning. ▪ Production Planning and Detailed Scheduling <ul style="list-style-type: none"> ▪ Simultaneous Planning of products and resources ▪ Flexible use of Planning methods ▪ Lot size planning, Set-up Optimization ▪ Optimization based on business targets ▪ Supply Chain Collaboration & Event Management
Availability Check	
<ul style="list-style-type: none"> ▪ Restricted to locations, one plant only ▪ Actual Capacities not taken into grant 	<ul style="list-style-type: none"> ▪ Cross-Plant / Rule based Availability Check, extended methods ▪ Controlled Consideration of Production Capacities
Exceptions	
<ul style="list-style-type: none"> ▪ Alert-Monitoring Tool not available 	<ul style="list-style-type: none"> ▪ Effective, Exception based management through Alert Monitoring

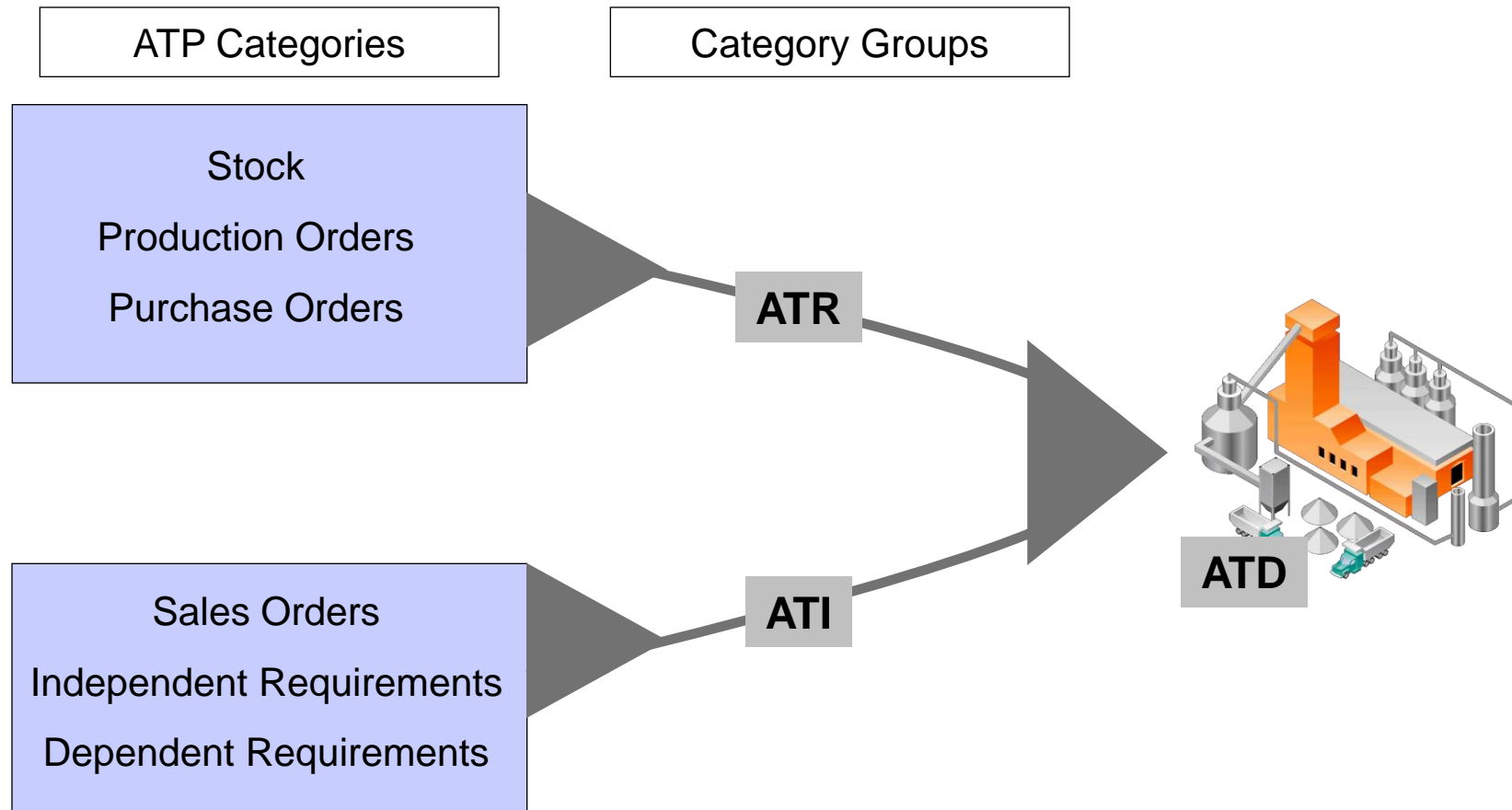
- 
- 1 Introduction
- 2 SCM Master Data and ERP Integration
- 3 Demand Planning (DP)
- 4 Supply Network Planning (SNP)
- 5 Deployment and Transport Load Builder (TLB)**
- 6 Reporting and KPIs

Deployment – Overview (Heuristics)



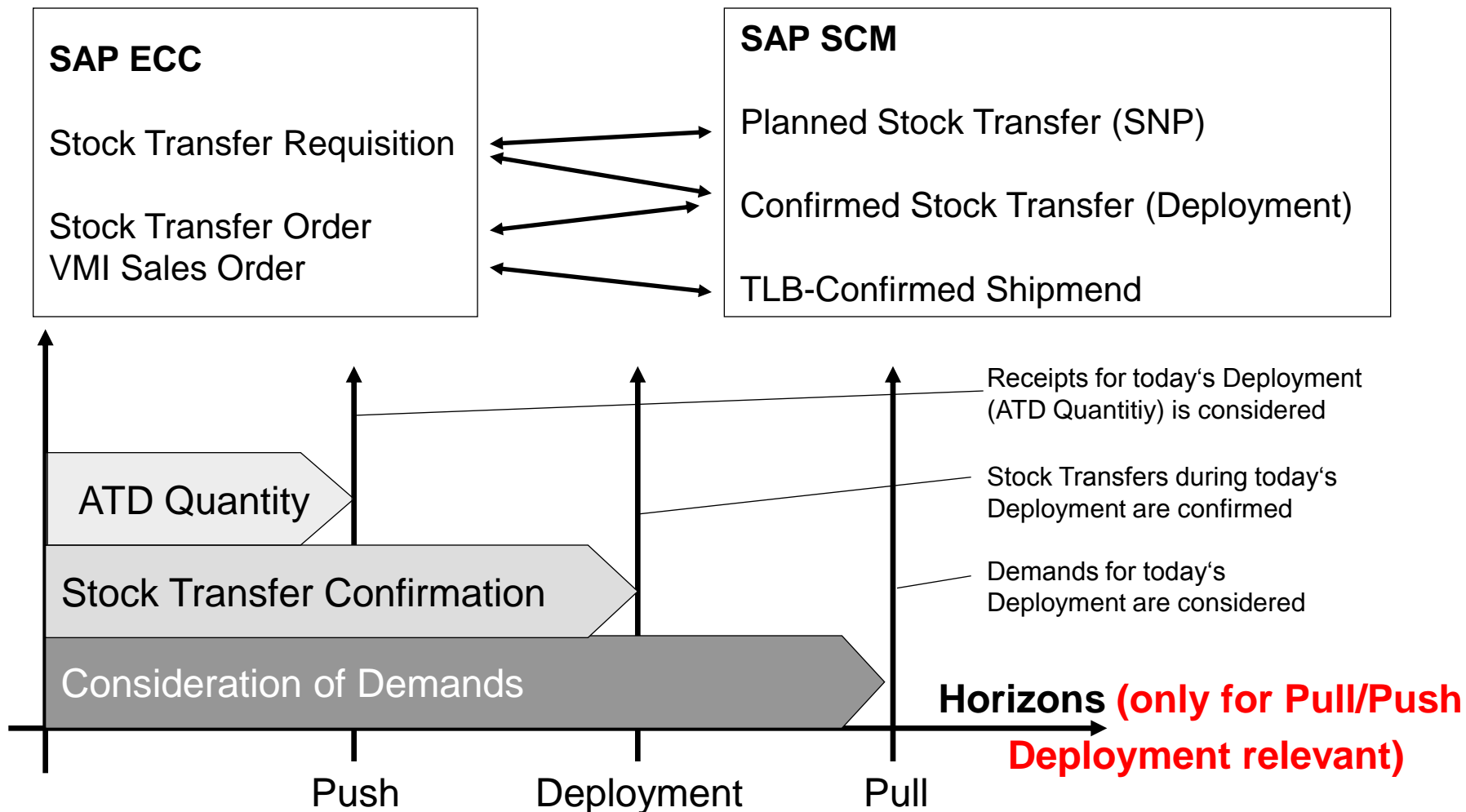
Deployment adjusts the stock transfers according to short-term changes in supply or demand (detailed distribution planning)

Deployment – ATD Quantity Calculation



The ATD (available-to-deploy) quantity determines the amount that can be distributed by the plant

Deployment – Main Settings for Deployment



Deployment – Fair Share Rules

Date	ATD Quantity	Demand
05.01.2009	1000	100 (DC1)
06.01.2009	900	500 (DC2)
07.01.2009	400	200 (DC1)
07.01.2009		600 (DC2)
Deployment Results		
05.01.2009	Plant to DC1	100
06.01.2009	Plant to DC2	500
07.01.2009	Plant to DC1	100
07.01.2009	Plant to DC2	300

Percentage Split according to Demand

ATD Quantity in the plant = 300			
DC	Priority	Demand	Deploy
DC1	3	500	0
DC2	1	200	200
DC3	2	300	100

Split according to Priority

DC1 Quota: 30% / DC2 Quota: 70%		
Date	ATD Quantity	Demand
05.01.2009	1000	100 (DC1)
06.01.2009	900	500 (DC2)
07.01.2009	400	200 (DC1)
07.01.2009		600 (DC2)
Deployment Results		
05.01.2009	Plant to DC1	100
06.01.2009	Plant to DC2	500
07.01.2009	Plant to DC1	120
07.01.2009	Plant to DC2	280

Percentage Split according to Quota Arrangements

ATD Quantity in the plant = 300					
DC	Planned Stock	Target Stock Level	% Target Stock Level	Deploy	% Target Stock Level
DC1	50	500	10	200	50
DC2	500	700	71,4	0	71,4
DC3	0	200	0	100	50

Percentage of Target Stock

Deployment – Pull / Push Rules

Situation		Push Horizon		Pull Horizon			
Demand at DC	200	200	200	200	200	200	200
Supply at Plant (cumulative)	200	1200	1700				
Pull							
Quantity to DC	200	200	200	200			
Stock in Plant	0	800	1100	900	900	900	900
Pull-Push							
Quantity to DC	200	600					
Stock in Plant	0	400	900	900	900	900	900
Push							
Quantity to DC	200	1000					200
Stock in Plant	0	0	500	500	500	500	500

Pull

Deployment only fulfills the demand within the Pull Deployment Horizon

Pull-Push

All Supply is distributed immediately to the demand locations to fulfill all demand within the Pull Deployment Horizon

Push

All Supply is distributed immediately to the demand locations

Transport Load Builder

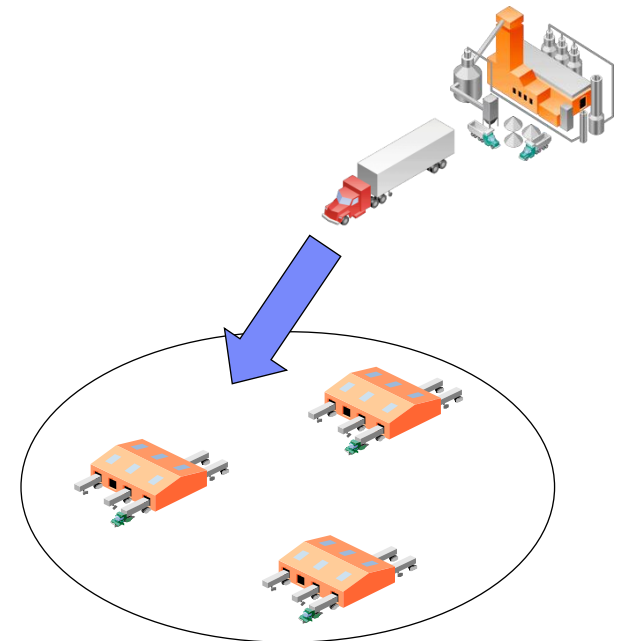
The Transport Load Builder (TLB) groups transport loads for certain means of transport whilst ensuring that the capacity of the means of transport is utilized as much as possible.

The main aims of TLB planning are:

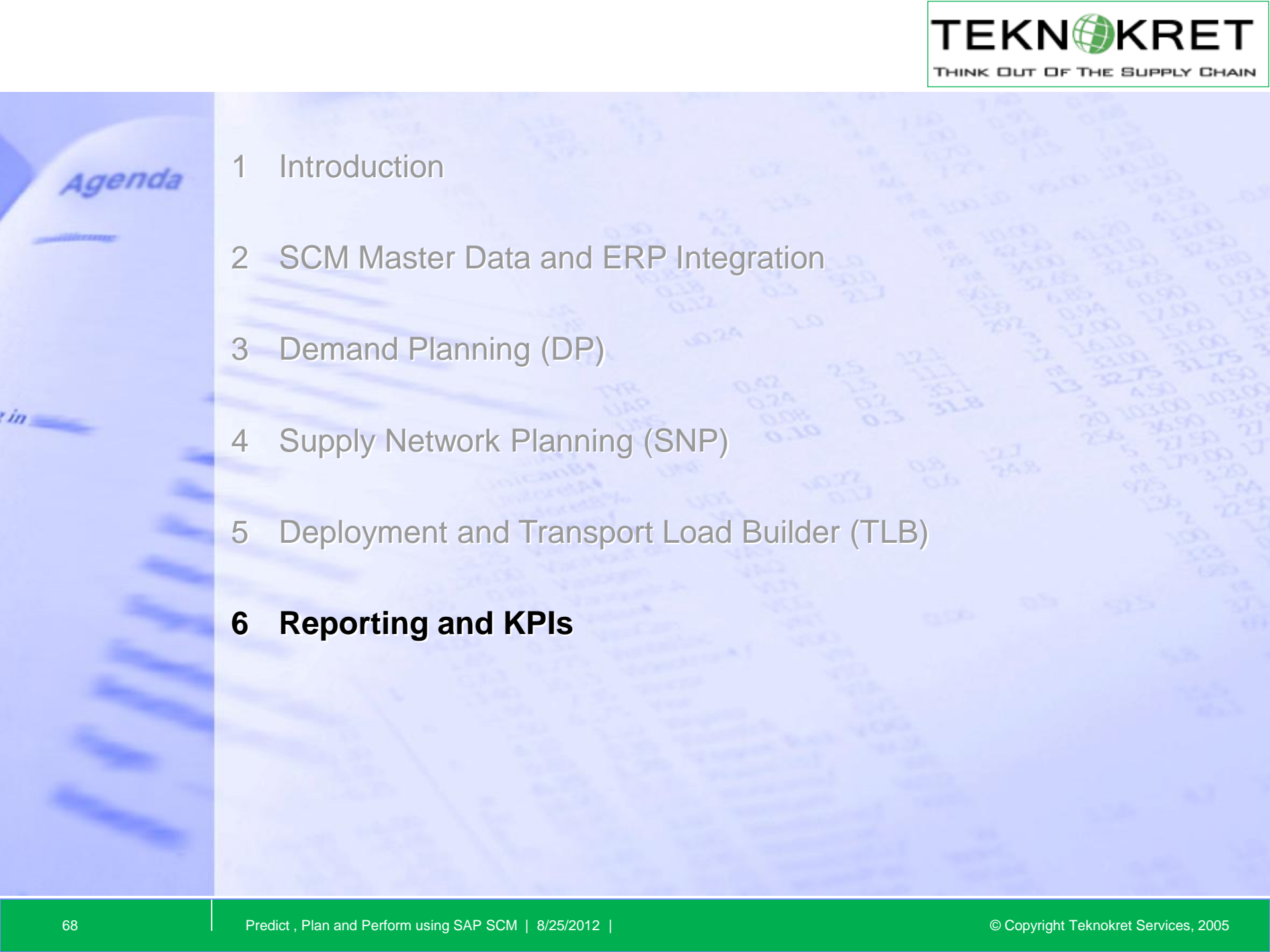
- Building of transport loads that are within the parameter limits defined by the user (such as weight and volume taking into account min/max values)
- Straight loading or load balancing of means of transport

It groups

- Products
- Time (Pull-In Horizon)
- Transportation Zones



The TLB converts Stock Transfer from the Deployment run into TLB Shipments

- 
- 1 Introduction
- 2 SCM Master Data and ERP Integration
- 3 Demand Planning (DP)
- 4 Supply Network Planning (SNP)
- 5 Deployment and Transport Load Builder (TLB)
- 6 Reporting and KPIs**

Reporting

Reporting in DP and SNP

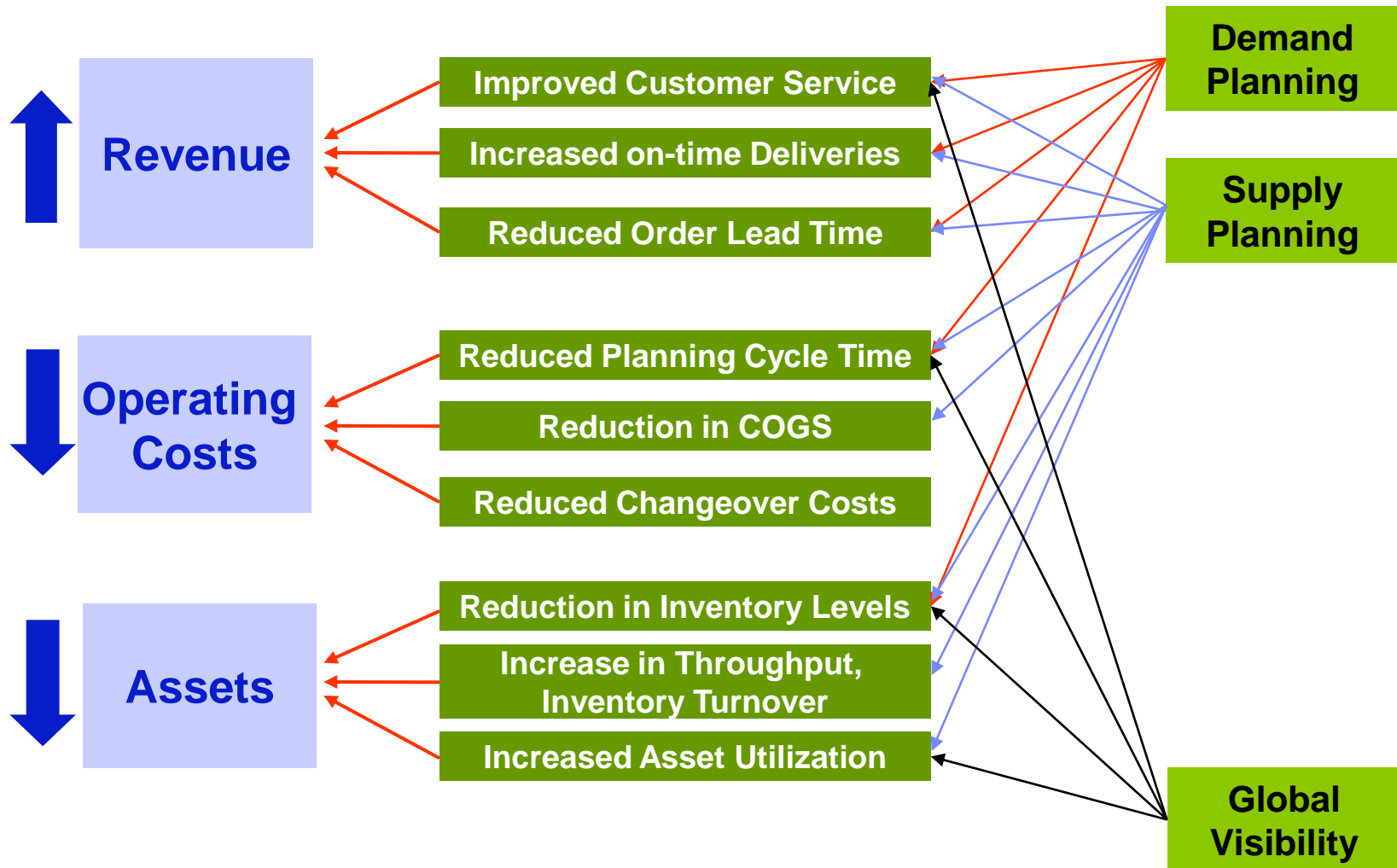
- Planning results can be downloaded (xls) from the DP and SNP planning book
- No standard reports in DP and SNP available
- Custom macros can be programmed to analyze
 - DP specific data
 - SNP specific data
 - DP & SNP data (complex!)

Reporting in SAP Business Warehouse (BW)

- Dedicated SAP application which contains plan data and actual data from SAP SCM and ERP systems (e.g. SAP R/3)
- Standard integration tools (extractors) to SAP SCM and SAP R/3

➤ **Limited SCM reporting capabilities. SCM philosophy is to deliver planning results to SAP BW or other data warehouse.**

KPIs supported by SCM DP and SCM SNP



Thank You

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