

Shaping demands to achieve corporate financial objectives

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Agenda

This presentation is intended to review

- Challenges in the current business environment
- Importance of demand shaping
- Demand shaping activities
- Use cases and sample product capabilities
- Summary

Industry Challenges



Typical Challenges

Shorter Product Lifecycles

- Frequent new product introductions putting increased burden on operations
- Shorter life span of the product making it difficult to forecast

Extreme Product Segmentation

- Extreme segmentation of the product by color and aesthetic attributes to meet various demographic needs causing stock-outs or excess inventory of certain products.
- Product variations to meet different geographical and legal requirements. For example, manuals, labeling and software to meet various language needs.

Disconnected sales and operations

- Lack of integration between sales/marketing and operations
- Planning and review process is extremely manual and time consuming

Inferior business processes and systems

- Manual processes, low visibility in a globalized business climate
- Multiple non integrated local systems

What are the implications?

Impact to customer service levels

- Stock outs due to insufficient forecast can cause customers to switch suppliers or be dissatisfied
- Reduced pricing power; affecting the margins

Improper capital allocation

- Forecast created for the wrong product could cause your supply chain to be over-driven resulting in excess inventory
- Impact to resources such as capital, space, production resources, etc.
- Lost opportunity to sell your products and increase revenue and profits

Inability to react to changing market conditions

- If changing market conditions are not turned into advantage, profitability may suffer
- Competitors may gain

Unmet expectations

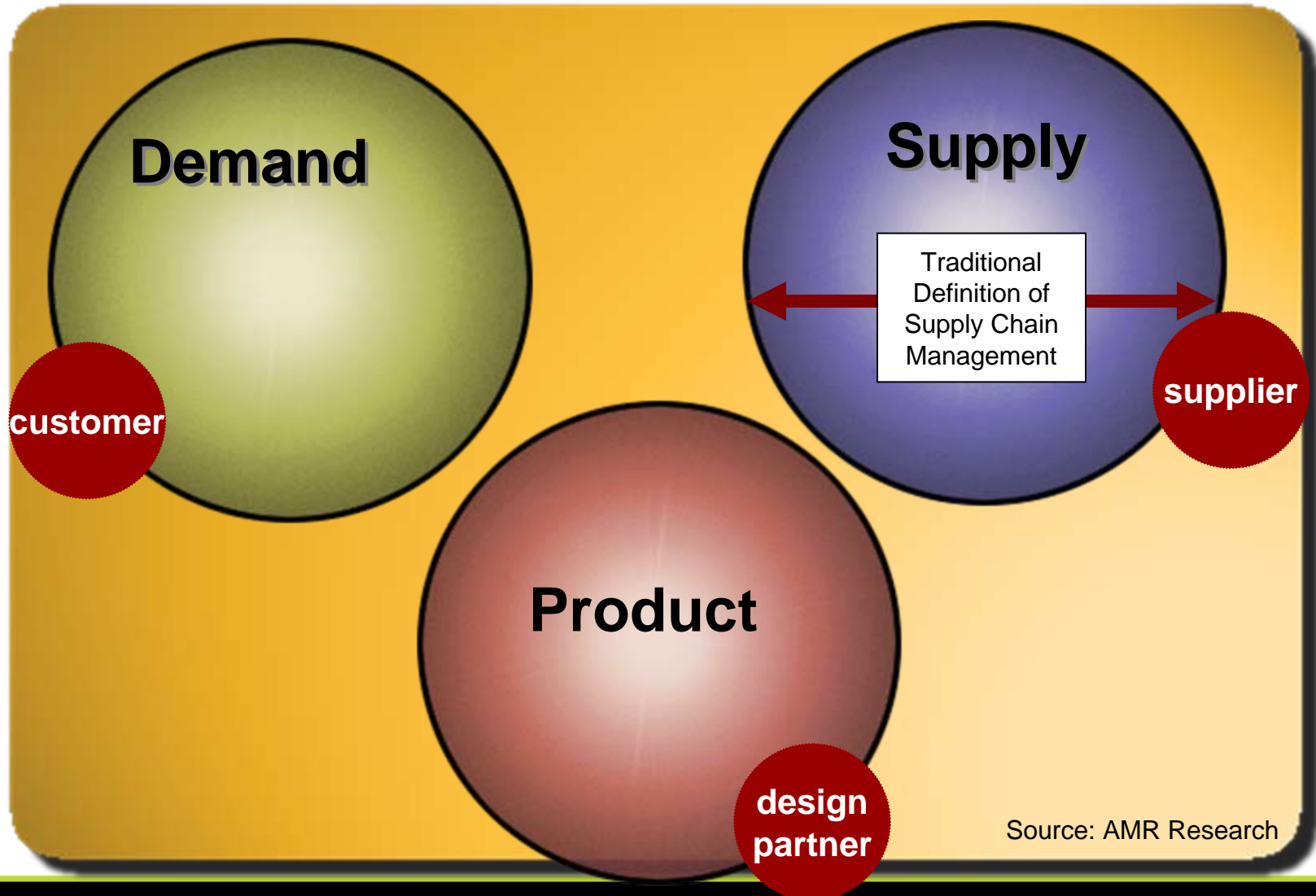
- All of the above could result in unmet corporate expectations and decline in shareholder value

Importance of demand shaping

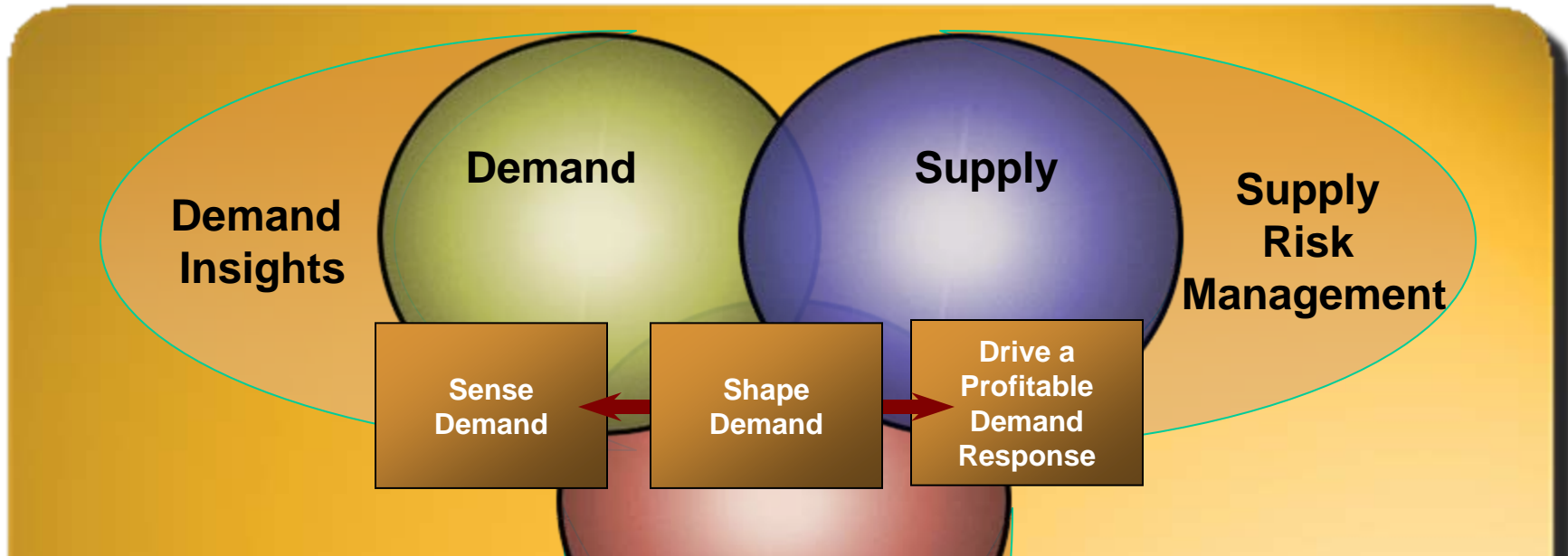
How 'shaping demand' can help

- Proactive approach to demand management
- Makes your supply chain demand driven
- Improved profitability due to proper prioritization of demands, building right products at the right time
- Promotes collaboration amongst all stakeholders
- Supports replenishment system with immediate visibility to changing needs

Traditional Supply Chains



Demand-driven Processes



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- Makes your supply chain demand driven
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Demand shaping

Shaping demands at the heart of a Demand Driven Supply Network (DDSN)

What is “Shaping Demands”?

- Shaping demands can be defined as aligning your forecast to reality by taking all possible variables into consideration. For example:

Strategic predictive forecasting

- Collaborate with stakeholders
- Historical demand patterns
- Managing new product introductions
- Discounts and promotions
- Trade promotion and promotion optimization

Operational planning to satisfy demands

- Sales and operations planning
- Supply planning based on global forecasts
- Supply positioning

Strategic Predictive Forecasting

Collaboration

- Collaborate to incorporate inputs from different stake-holders in the organization – such as marketing/sales/Operations
- Forecast at the appropriate level of aggregation. For example, there may not be enough information for forecast at an individual item/location combination

Historical demand patterns

- Seasonality and Trends
- Shape Modeling
- Causal Factors

Manage new product introductions

- New item / store introductions
- Lifecycle / supersession / Product phase-in and phase-outs

Discounts and promotion optimization

- Effect of discounts and promotions
- Promotion optimization

Operational Planning

Tolerance along time and organization dimensions for fulfilling demands

- Global forecasting and consumption
- Automatically sourcing forecasts to appropriate organizations that fulfill demands

Sales and Operations Planning

- Review current demand fulfillment
- Consider constrained supply
- Re-prioritize demands

Supply Positioning

- Consider forecast accuracy measures to determine inventory levels
- Postponement optimization

Use cases to shape demands

Scenario#1: A consumer electronics manufacturer's predicament

Popular line of mobile devices works with multiple technologies, caters to multiple demographics, sells through out the world.

What is needed to effectively manage the forecasts of a wide variety of related products?

- Collaborate between various account owners and regional and global managers to arrive at a consensus:
 - I. Send/receive information between stakeholders back and forth
 - II. Manage by exception

- Ability to take forecasts entered at higher level and disaggregate them to appropriate lower level SKUs, while considering the following:
 - I. Historical distribution
 - II. Order Backlog
 - III. Any additional weights specified

Workflow enabled collaboration

Why collaboration capabilities are important?

- It is extremely critical to bring sales, operations, finance and marketing to agreement on a single forecast number.
- A platform that enables collaboration between these stakeholders will result in a better aligned corporation marching towards a common goal.

Ability to easily tailor process flows that is custom to each business

- Web based workflow development tool allows creating new workflows and modifying canned workflows easy.
- For example, you can have a workflow that enables collaboration between account manager, regional manager and country manager before finalizing the forecast.

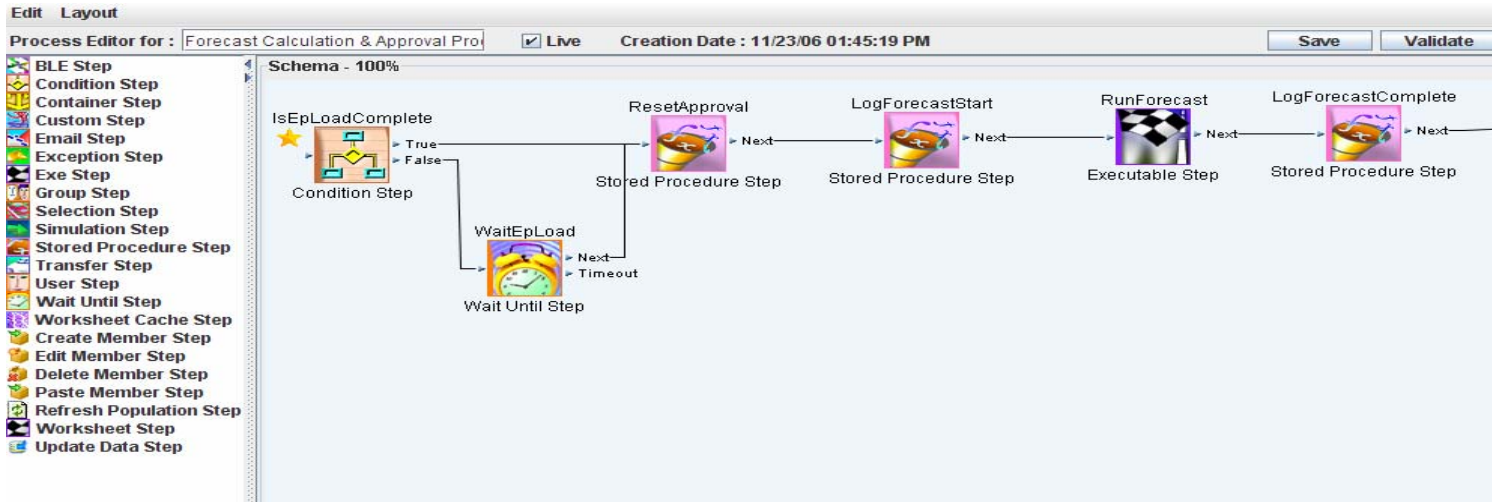
Process to define and handle exceptions

- Create workflows to handle exception events such as over/under forecasting and remediation plans

Workflows to integrate external systems

- Facilitate integrating external systems' data through workflows
- For example, allocate around intersections that have sales orders

Workflow enabled collaboration between stakeholders



Welcome sop | My Collaborator Workbench | 02/13/08

Contents | Planning Applications | Tools and Applications | Process Monitor

My Tasks

Done	Message	Select value	Source	Assign date	Due date
<input type="checkbox"/>	Weekly Consensus Fcst Hi - Sales forecast for next quarter updated - sync'ed with main customers now.	None	Sales4	06/06/07 10:47:57 PM	None
<input type="checkbox"/>	YTD Target vs Plan Hi - need to discuss current performance against target - marketing should be involved to promote latest SKU's to DRIVE our DEMAND	None	Finance1	06/06/07 10:52:29 PM	None

My Worksheets

Name	Description	Send as Task
Baseline - Overview	Introduction to User Navigation and Features	<input type="button" value="Send"/>
Baseline - Detail		
Baseline - Causal Example		
Baseline - Manual Splitting		
Baseline - Prospect Data		
Demand - Profiles		
Demand - Weather Effect		
Demand - Forecast Accuracy		
Demand - POS Consumption		
RT SOP - Consensus - Final Plan - SOP Lead		
RT SOP - SIOP Review		
NPI - Shape Modeling		
NPI - Shape Alignment		

Send task to user - Windows Internet Explorer provided by Comcast

To... dm;

Message: Forecast review

Description: Please review my baseline forecast and let me know if you agree

Worksheet: Baseline - Overview

File attachment:

Mandatory fields

Disaggregating higher level entries to lower level SKU/Location

Why is this important?

- If the forecast quantities end up entered for the wrong products/locations, it could result in overconsumption and hence result in excess inventory
- Can be mitigated with robust disaggregation mechanisms

Demantra supports multiple disaggregation schemes

- Proportional – where the allocation logic is based on another series
- Proport Mechanism to control disaggregation during analytical engine runs

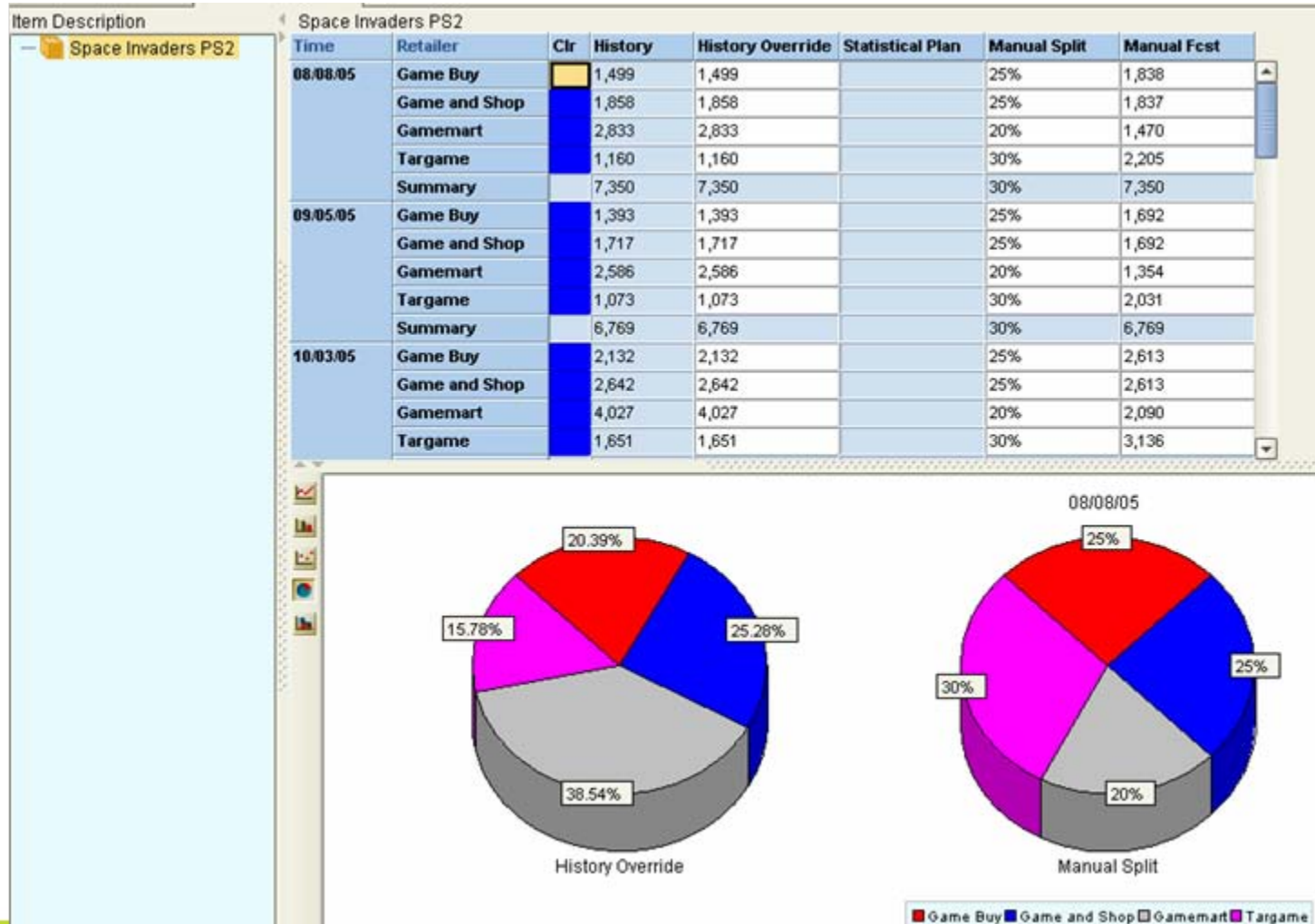
Proportional

- When a “series” is defined, modelers have the ability to define the allocation to be based on another series.
- The basis series could be computed based on a business specific logic or could be collected data series such as order history and backlog.

Custom Methods

- Define custom methods that can be invoked for any special allocation logic.
- For example, allocate around intersections that have sales orders

Disaggregating higher level entries to lower level SKU/Location



“Expressions” to facilitate numerical calculations / quick review

Server Expressions

- These are expressions that uses database grouping functions such as average, sum, etc.
- For example, you could have an expression that computes the average selling price at the category level and determine profitability.

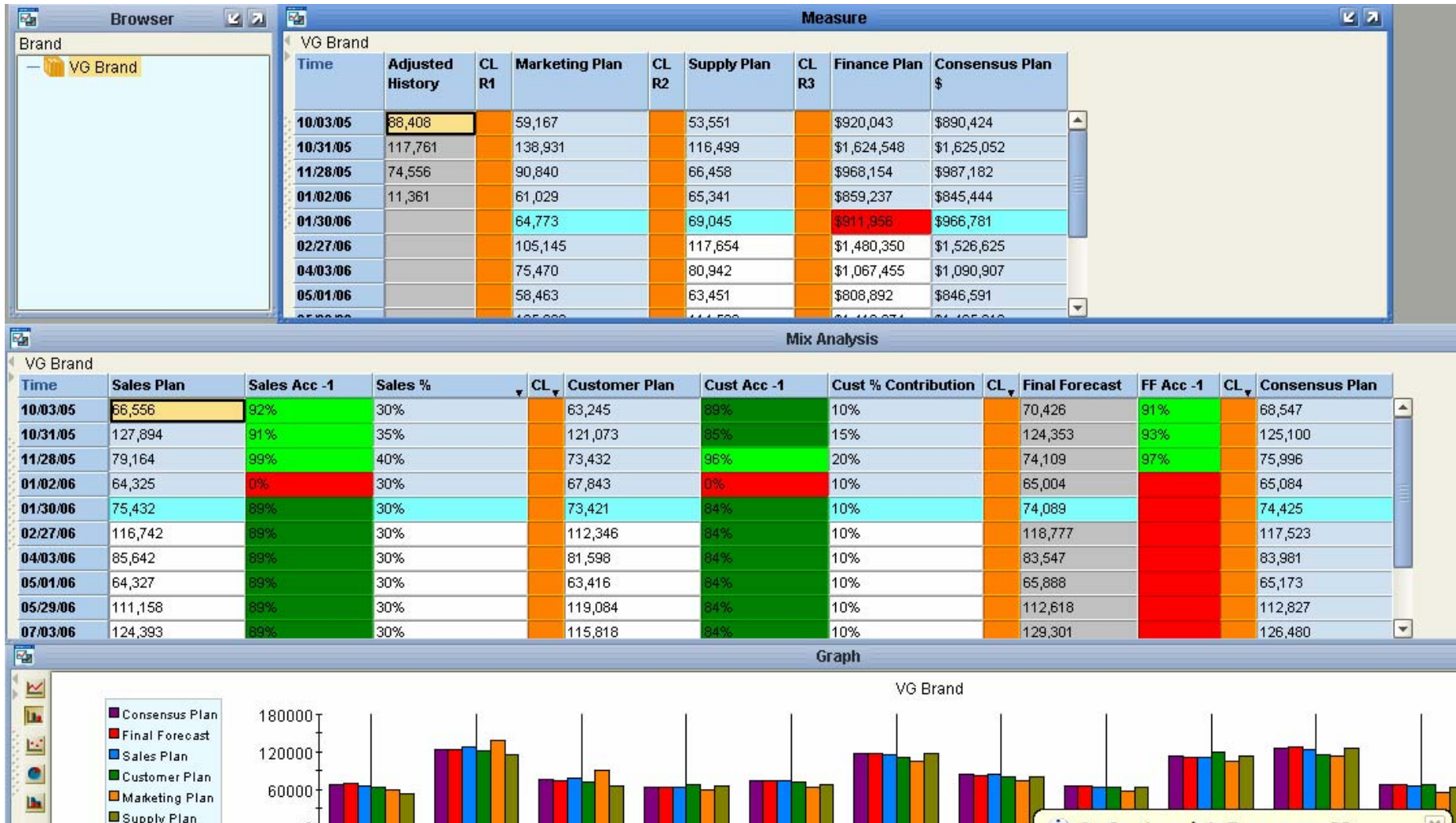
Client Expressions

- These are expressions that enable using mathematical formulas and if-then-else statements using different series data.
- For example, you could have an expressions that makes the forecast equal to or above the sales order quantity for any given combination.

Color expressions

- These are expressions that color code the cell based on conditionality.
- For example, you could color all cells red when the forecast variance is above a certain percentage.

Expressions / Color Coding



Scenario#2: A manufacturer of construction equipment

The business is growing but also depends on continued economic indicators. Seasonal business with the type of equipment sold depending on the weather patterns.

What is needed to accurately forecast considering all the factors that affect the business?

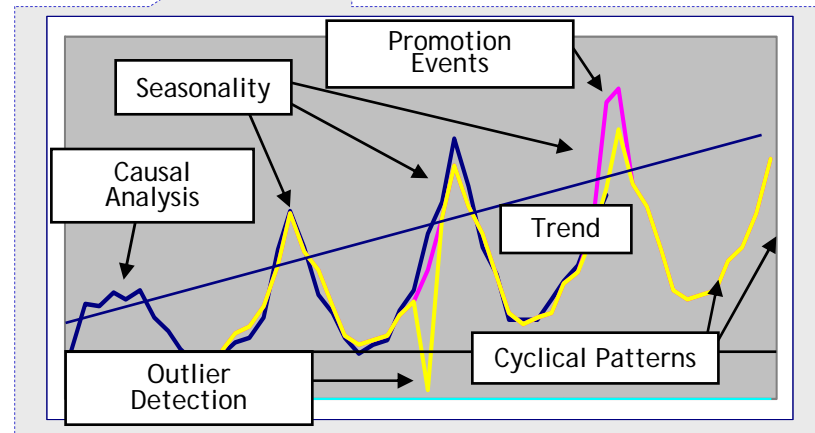
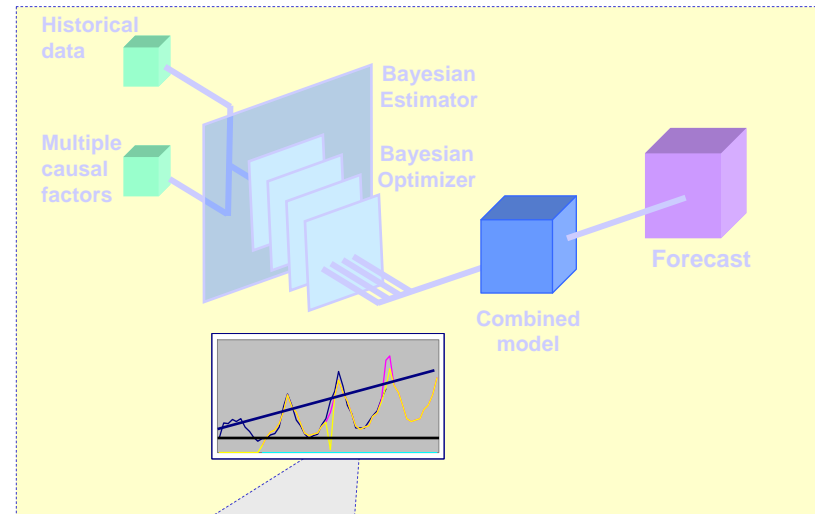
- Ability to consider the historical trends and seasonality to predict forecast.
 - I. Sophisticated algorithm
 - II. Ability to tune the forecasts

- Mimic trends occurred in the past
 - I. Ramp up / Ramp down

- Consider all the causals that influence the forecast one way or the other
 - I. Global causal factors
 - II. Local causal factors

Demantra's Statistical Forecasting Capabilities

- Bayesian-Markov algorithm uses a mixed model that is better than best-fit approaches.
- Unlimited dimensions and hierarchies
- Forecast tree uses hierarchy to determine the best levels to forecast
 - For example, start at the lowest levels in the hierarchy and then move up one step at a time.
- Attribute based forecasting capabilities
- Nodal tuning capabilities
- Advanced reporting capabilities such as graphs, charts, various summarization capabilities.



Shape Modeling

Activity based shape modeling

- Demantra captures the profile of historical demand over a period of time
- Apply shapes scaled for volume and time to future forecasts
- Alignment of future forecasts shape dictated by Quantity Alignment Duration specified in another series
- Supported in Demand Planning mode and Promotion Effectiveness mode

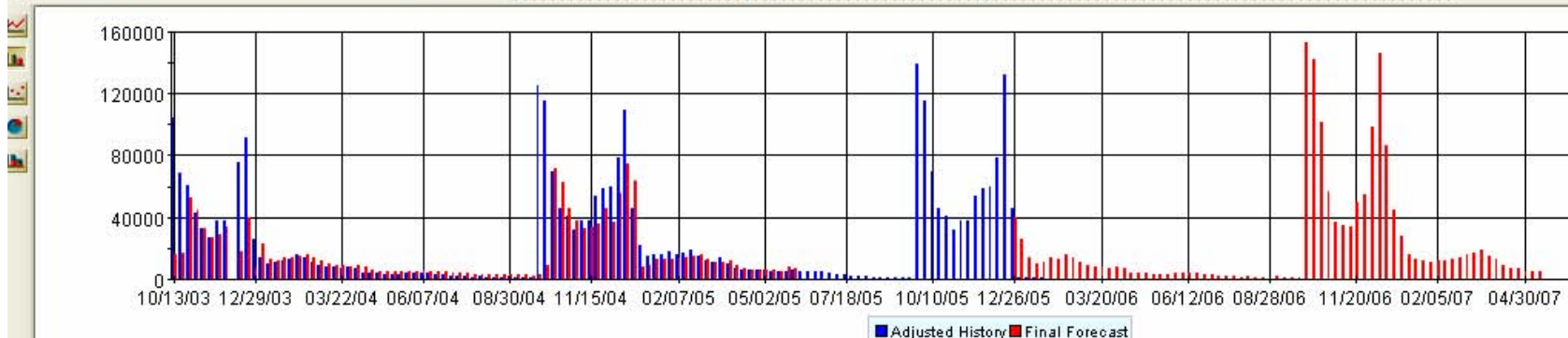
Promotion Shape Modeling

- Similar to Activity based shape modeling but in addition considers promotion attributes
- Available only in PE mode

Shape modeling applicable only when there is continuous stream of demand data

Activity Based Shape Modeling

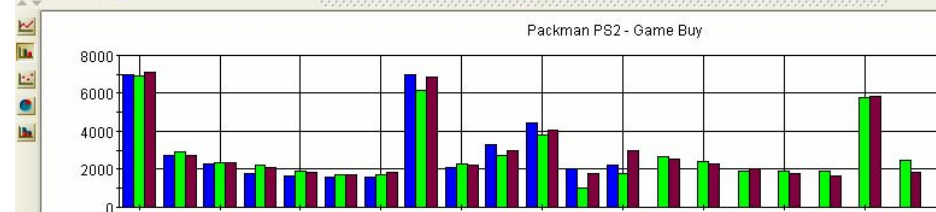
File	Worksheet	Edit	View	Options	Data	Help	Window		
Time	Clr	Demand Factor	Adjusted History	Simulation	Final Forecast	Approval	Approved By	Time Fence	Product Launch
10/13/03		0%	104,675		15,575	<input type="checkbox"/>			Active
10/20/03		0%	68,222		16,723	<input type="checkbox"/>			Start
10/27/03		0%	60,449		52,836	<input type="checkbox"/>			Active
11/03/03		0%	42,461		44,791	<input type="checkbox"/>			Active
11/10/03		0%	32,364		32,964	<input type="checkbox"/>			Active
11/17/03		0%	27,084		26,967	<input type="checkbox"/>			Active
11/24/03		0%	38,134		28,333	<input type="checkbox"/>			Active
12/01/03		0%	37,516		34,213	<input type="checkbox"/>			Active
12/08/03		0%			0	<input type="checkbox"/>			Active
12/15/03		0%	75,312		18,268	<input type="checkbox"/>			Active
12/22/03		0%	91,291		39,795	<input type="checkbox"/>			Active
12/29/03		0%	26,304		7,504	<input type="checkbox"/>			Active
1/05/04		0%	13,878		22,641	<input type="checkbox"/>			Active
1/12/04		0%	10,088		13,166	<input type="checkbox"/>			Active



Causal Factors

- **Global Factors**
 - Model global causal factors that apply to all products and locations
 - For example, holidays such as Thanksgiving and Christmas, seasons, etc
- **Local Factors**
 - Local causal factors apply to a specific product and location
 - For example, a snow plough is more likely to sell more during snowy season in the North-East than in Arizona.
- Improved forecast accuracy as a result of better incorporation of the causals.

Time	Clr	History	History Override	Demand Factor	Adjusted History	Easter Holiday	Statistical Plan	Simulation	Base Override
02/21/05		3,138	7,000	0%	7,000	YES		6,920	
03/21/05		2,720		0%	2,720	NO		2,907	
04/18/05		2,269		0%	2,269	NO		2,319	
05/16/05		1,770		0%	1,770	NO		2,204	
06/13/05		1,678		0%	1,678	NO		1,884	
07/11/05		1,618		0%	1,618	NO		1,727	
08/08/05		1,570		0%	1,570	NO		1,733	
09/05/05		1,504	7,000	0%	7,000	YES		6,172	
10/03/05		2,095		0%	2,095	NO		2,314	
10/31/05		3,301		0%	3,301	NO		2,739	
11/28/05		4,440		0%	4,440	NO		3,795	
12/26/05		1,291	750	0%	2,041	NO		1,023	
01/23/06			2,250	0%	2,250	NO		1,761	
02/20/06				0%		NO	2,549	2,661	
03/20/06				0%		NO	2,272	2,414	
04/17/06				0%		NO	2,028	1,873	
05/15/06				0%		NO	1,787	1,911	
06/12/06				0%		NO	1,641	1,895	
07/10/06				0%		YES	5,830	5,752	



Scenario#3: A retailer on an aggressive growth trajectory

10 – 20 new stores being opened every year. New products being introduced in existing stores.

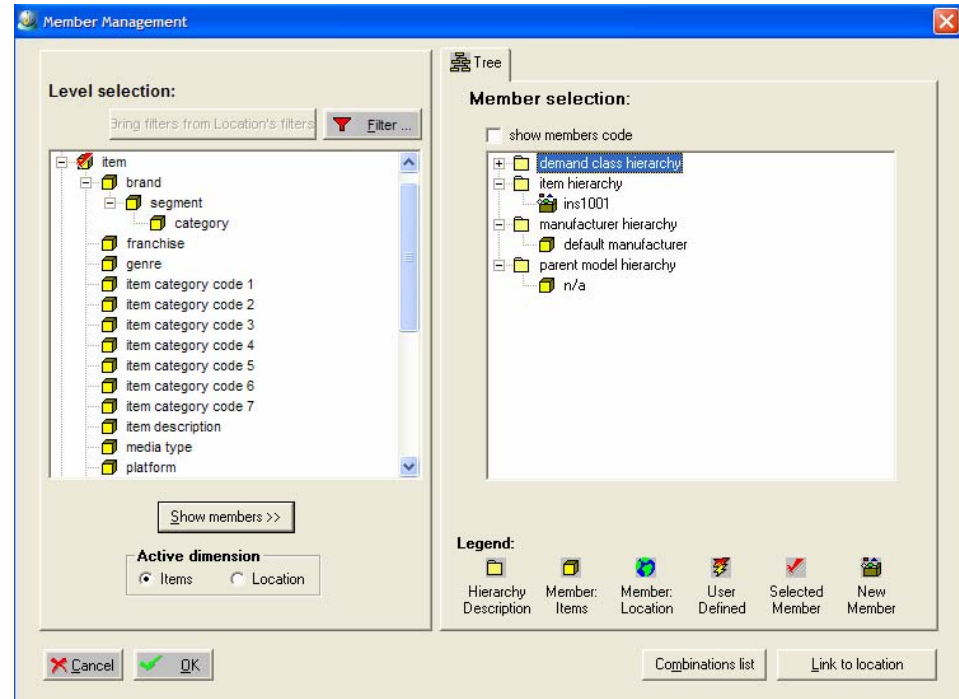
New products and stores don't have any history. How do they predict demand for their new locations and products? How to effectively promote a product and provide incentives to push slow moving products?

- Member management
 - I. Introduce new products
 - II. Introduce new stores

- Chaining
 - I. Copy history of like stores/like products for new stores and products respectively
 - II. Life cycle and super-session

Member Management

- New Products Introduction
 - All “combinations” are stored at lowest levels
 - Most members have “combinations” with sales data and hence enabled for forecasting
 - For introducing new, use tools such as Member Management to enable them for forecasting
 - Create a new member at any aggregation level in the product hierarchy – but typically lowest level members
- Link new products to Locations
 - Link a new product to a location or an existing product to a new location
 - Create combinations of product/locations
- Dummy history creation
 - Insert dummy historical records
 - Enables viewing combinations in worksheets



Chaining

Forecasting new product / stores

- Chaining is the process of copying series data from one set of combinations to new set of combinations.
- If you have new product/location combinations, use chaining to create history so Demantra can generate forecast.

Item Similarity

- For example, you created new store X which sells same items as existing store Y
- Chaining creates all the relevant item combinations for new store X based on Y

Location Similarity

- For example, you created a new item B which is similar to item A and sold in all locations
- Chaining creates all relevant location combinations for B based on A

Proport Mechanisms

- Multiple proportionality options exist for disaggregating to new combinations – such as Target, Source, Equal and Similar

Scenario#4: A global telecommunications equipment manufacturer shipping products from many facilities

Forecasting by a specific “ship-from” organization can lead to over/under driving the supply chain.

Company needs the ability to forecast at a global level and let the operations determine the right source at fulfillment time.

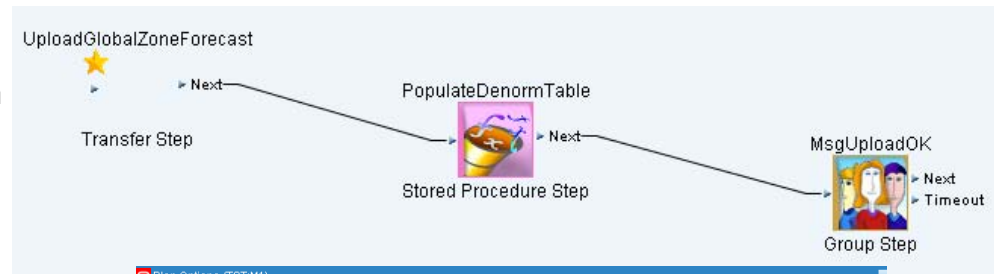
- Global Forecasting
 - I. Consumption by different levels in Location/Item hierarchy
 - II. Dynamic sourcing of the forecast to appropriate fulfillment centers

- Consumption tolerance along time dimension
 - I. Backward and Forward days
 - II. Consume within time bucket

Global Forecasting – Publish from Demantra, Consume and Distribute within ASCP

- Publish forecast from Demantra to ASCP without the context of an Organization
 - Define sourcing rules to distribute the forecast to appropriate fulfillment centers based on regions/category/Item and Instance.
 - ASCP utilizes the sourcing rules to distribute the remaining forecast after consumption.
- Consumption at multiple levels in location hierarchy
 - Zone / Region
 - Ship to Location
- Consumption by multiple levels in Item hierarchy
 - Item
 - Demand Class

634	EBS Upload Local Forecast	dm	12/16/06	01/21/08	0	●	Edit
635	EBS Upload Global Zone Forecast	dm	12/16/06	02/12/07	0	●	Edit
636	EBS Upload Local Fcst. Demand Class	dm	12/16/06	02/19/07	0	●	Edit
637	EBS Upload Global Zone Fcst. Demand Class	dm	12/16/06	02/19/07	0	●	Edit



Plan Options (TST:M1)

Plan: Optimized | Optimized Plan | Plan Type: Manufacturing Plan

Main | Aggregation | **Organizations** | Constraints | Optimization | Decision Rules

Global Demand Schedules

Name	Description	Type	Ship To	Consumption Level
Global Zone Cns Fcst(t)	Global Zone Consensus F	DPSCN	Zone	

Organizations

Org	Description	Net WIP	Net Reservations	Net Purchases	Plan Safety Stock	Ir Salt
TST:M1	TST:Seattle Manufacturing	✓	✓	✓	✓	
TST:S1	TST:Chicago Subassembl	✓	✓	✓	✓	
TST:M2	TST:Boston Manufacturing	✓	✓	✓	✓	

Demand Schedules

Name	Description	Include Targets	Ship To Consumption Level	Inter Plant
		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>		<input type="checkbox"/>

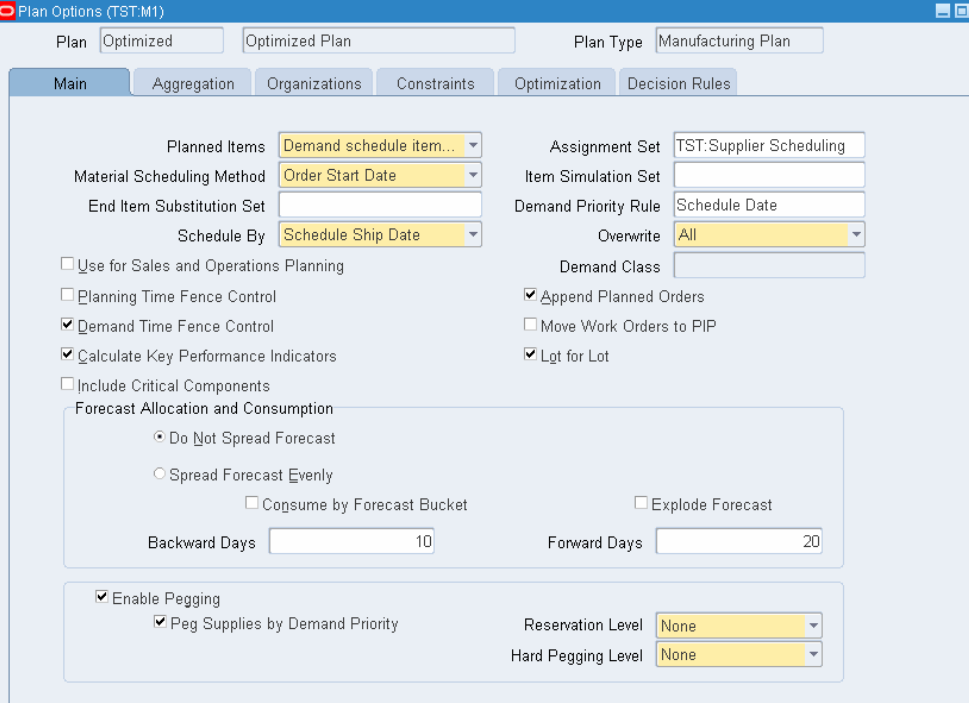
Supply Schedules

Name	Description	Type

Subinventory Netting

Consumption tolerance along time dimensions

- **Backward Days**
 - First look for the forecast on the day of the sales order.
 - Then days backwards from sales order date the forecast should be consumed.
- **Forward Days**
 - After scanning backwards, scan forward to look for forecast to consume.
- **Consume within time bucket**
 - For non-daily buckets, force the consumption of the forecast only within that bucket and not allow spanning backwards and forwards.
- **Criticality of consumption**
 - If the forecasts are not consumed properly, supply chain will be overdriven causing excess inventory
 - All these different options can be taken advantage to shape forecast demands to align with reality.



Plan Options (TST.M1)

Plan: Optimized | Optimized Plan | Plan Type: Manufacturing Plan

Main | Aggregation | Organizations | Constraints | Optimization | Decision Rules

Planned Items: Demand schedule item...
 Material Scheduling Method: Order Start Date
 End Item Substitution Set:
 Schedule By: Schedule Ship Date

Assignment Set: TST:Supplier Scheduling
 Item Simulation Set:
 Demand Priority Rule: Schedule Date
 Overwrite: All
 Demand Class:
 Use for Sales and Operations Planning
 Planning Time Fence Control
 Demand Time Fence Control
 Calculate Key Performance Indicators
 Include Critical Components

Forecast Allocation and Consumption

Do Not Spread Forecast
 Spread Forecast Evenly
 Consume by Forecast Bucket
 Explode Forecast

Backward Days: 10 | Forward Days: 20

Enable Pegging
 Peg Supplies by Demand Priority
 Reservation Level: None
 Hard Pegging Level: None

Summary

Shaping demands to achieve financial objectives

Start with the corporate objectives

- Identify and prioritize corporate objectives
- For example, improve forecast accuracy by 10% or reduce stock-outs of certain product line, etc.

Drill down to specifics

- Determine what is needed to accomplish the objectives
- For example, better collaboration among stakeholders or improved statistical forecasting capability, etc.

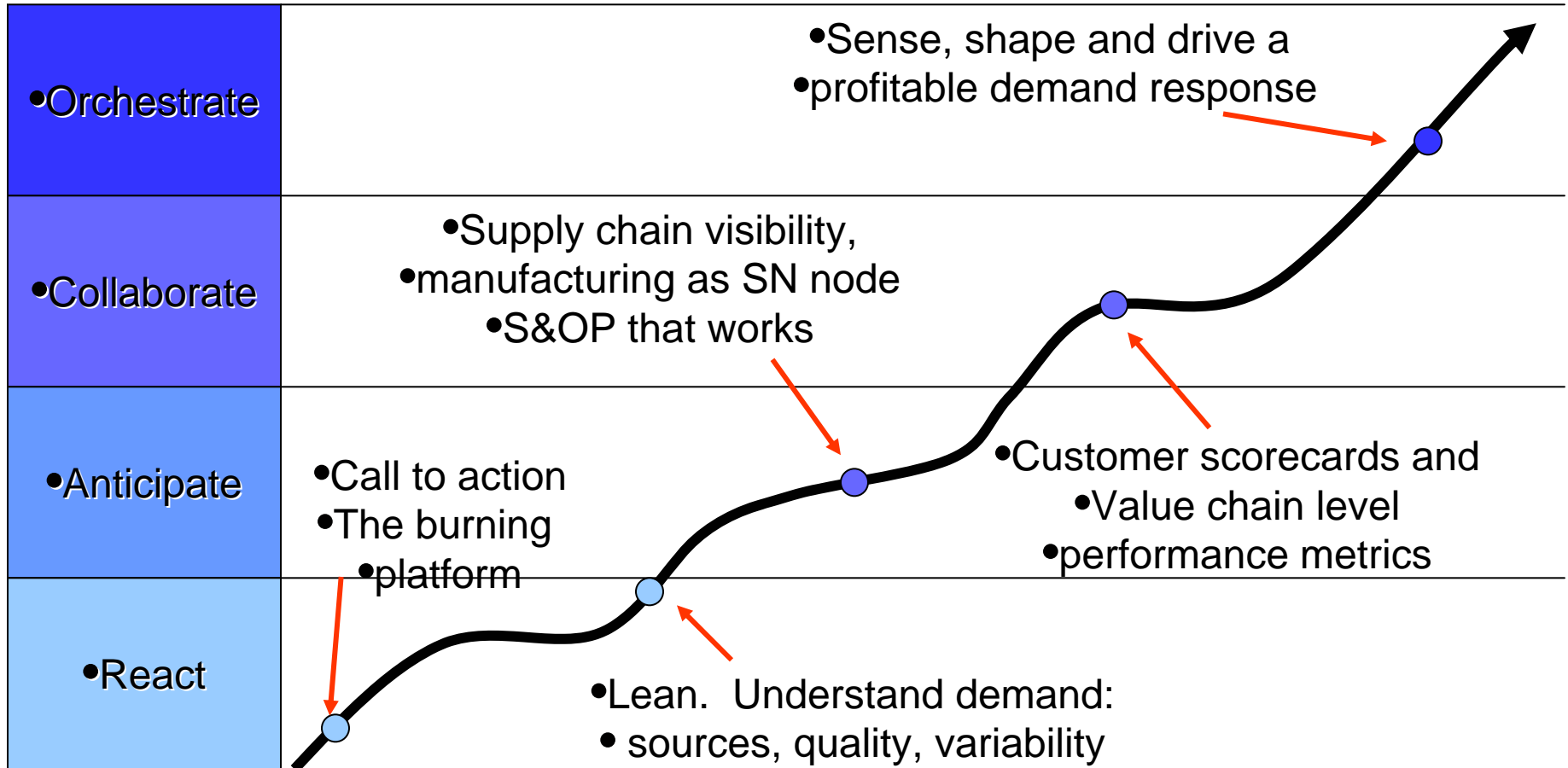
Map the software functionality to meet specific requirements

- Demantra is a suite of products within larger APS umbrella with many components and overlapping features
- Identify the specific features that meet your needs
- Then choose the components that provide those features

Layout an incremental rollout plan

- Start with the quick wins
- Expand the footprint with minimal change management impact

Journey....



Call to Action

Simple questions to determine the call to action.....

- **Do you know what your forecast accuracy is?**
- **How much more profits will be added by improving your forecast accuracy by 5%?**
- **Are your financial metrics better than your industry average?**
- **Do your internal teams such as sales, marketing, operations and finance talk to each other on customer wins, losses, financial targets, promotions, etc?**
- **Do you arrive at a single forecast that all stakeholders agree upon?**
- **Can your IT systems/processes facilitate quickly reacting to changes in supply or demand picture? For example, provide ability to execute daily/weekly planning cycles.**