

Enhancing SAP APO DP to forecast for Private Label Consumer Goods

Adrian Bentley
Demand Manager

*Passionate
about
Private Label*



Today



- Background to McBride
- Implementation of SAP APO DP
- Automating cleansing of Promotional Sales History
- Getting the best from a statistical forecast (top down vs. bottom up)
- The Product Lifecycle challenge
- The future

*Passionate
about
Private Label*



Background to McBride - Customers



- McBride is Europe's leading producer of Private Label Household and Personal Care products.
- Supplying own brand products to all the major European retailers, performing contract filling for international FMCG companies and operating a small branded portfolio.



Passionate about Private Label



Background to McBride - Categories



- McBride operates in all Household and Personal Care categories



- Last years turnover was in excess of £750m and we have weekly sales of approximately 19m units/week

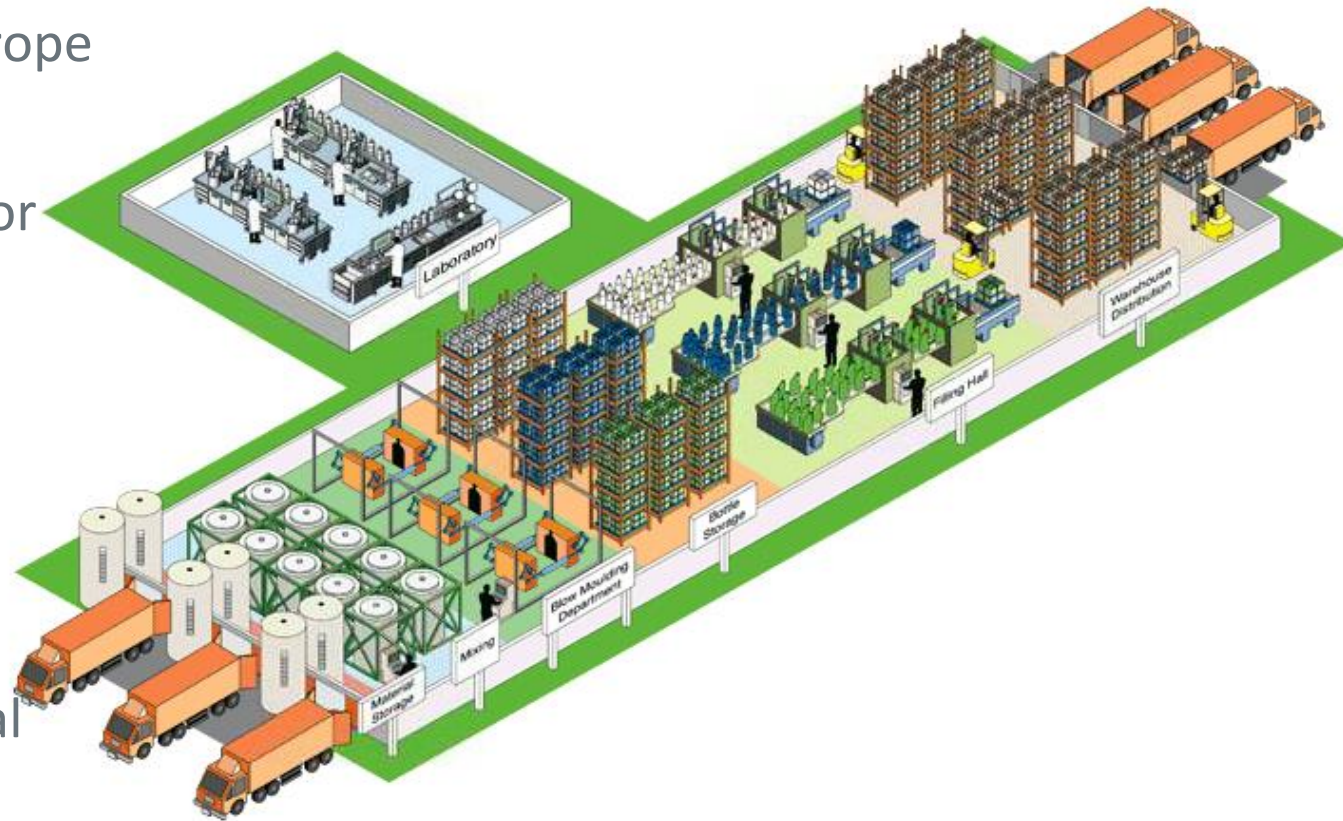
*Passionate
about
Private Label*



Background to McBride – Supply Chain



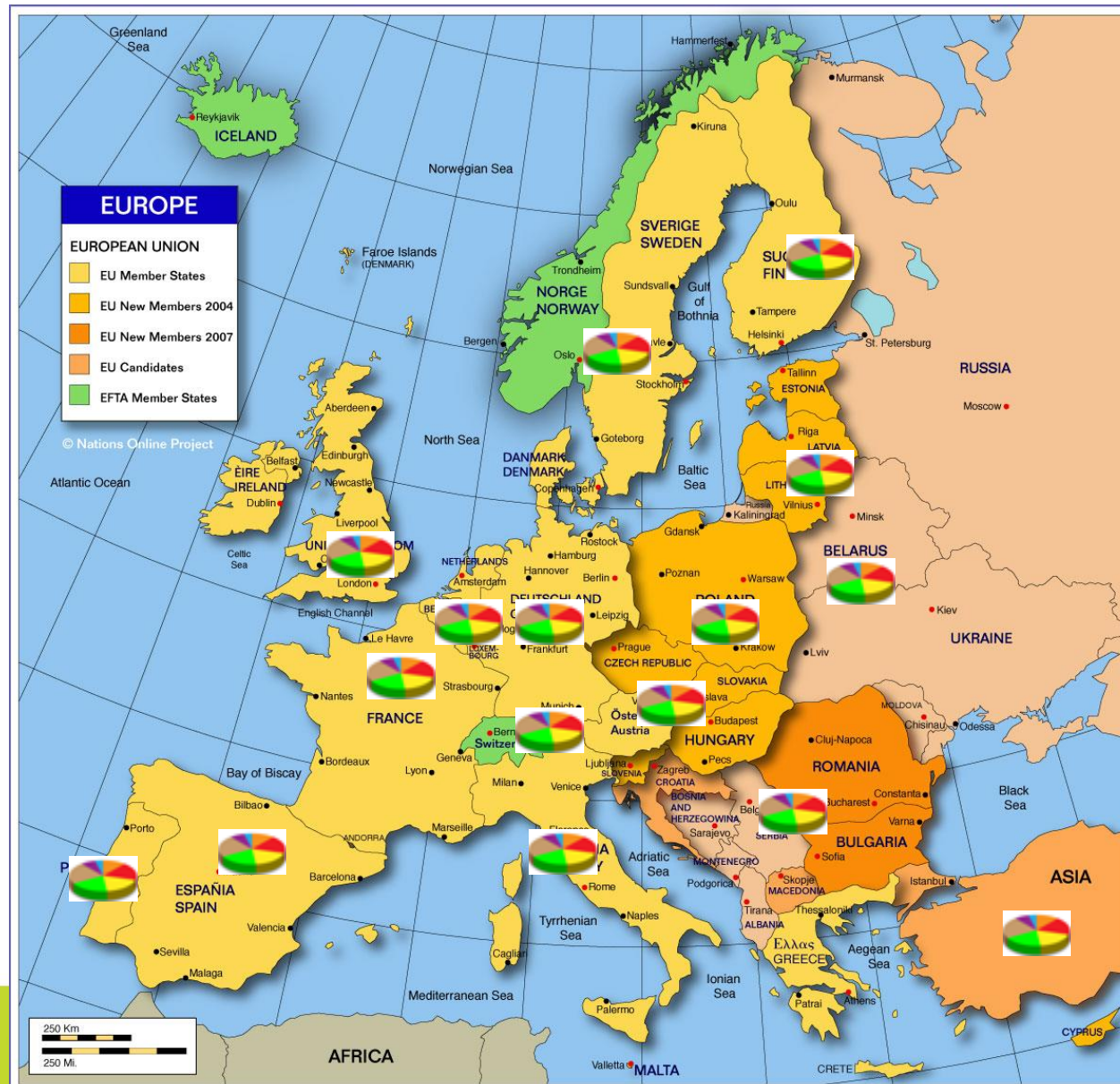
- McBride has a fairly straightforward supply chain
- 14 factories across Europe
- Delivery from factory or DC to customers DC
- Mostly full pallets & full trucks
- Noise in Demand signal



Background to McBride – Markets

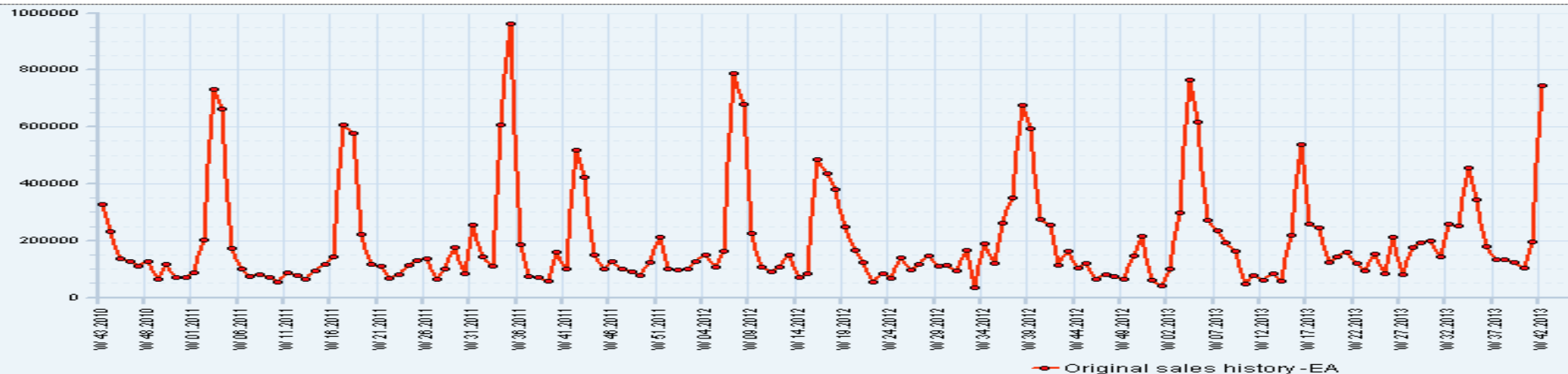


- Depending on geography and category Private label share of market varies from 20% – 50%. McBride share of Private Label varies (again) from 10% – 60%.
- Differing levels of market visibility by category and geography



Background to McBride – Promotions

- Significant levels of promotional activity, both McBride driven and in the general market place.
- Massive impact on forecasting
- Uplifts 2x to 20x
- Cannibalisation 0.9x to 0.2x
- Creates noise in supply chain
- Big forecasting challenge



Background to McBride – Product Lifecycle



- Firmly in the FMCG sector with approximately 5000 products across the group delivered to 500+ customers, with 30-40% of products undergoing a change at any one time.
- As Private label is about offering maximum value to the consumer the cost base is kept to a minimum.
- The challenge is to maximise the effectiveness of APO for McBride without additional resource



Implementation of APO DP



CE Forecasting System

- Fixed Sales History
- Moving Average Forecast

UK Forecasting System

- Basic Exponential Smoothing (Q)
- Limited Promo functionality
- No aggregation

Group APO Platform

- Full data structure
- Ability to (dis)aggregate
- Range of statistical choices
- Integration with product lifecycle

Future?

- Improved statistical modelling
- Maximising use of alerts
- Minimal manual intervention



Implementation of APO DP

- Implementation project had several challenges to face
 - 2 instances of SAP
 - 3 Business Divisions
 - Different Markets
 - Different Processes
- Technically these came down to....
 - Material Coding
 - Master Data
 - Product Lifecycle Management
 - APO Setup



*Passionate
about
Private Label*



Implementation of APO DP – Material Coding



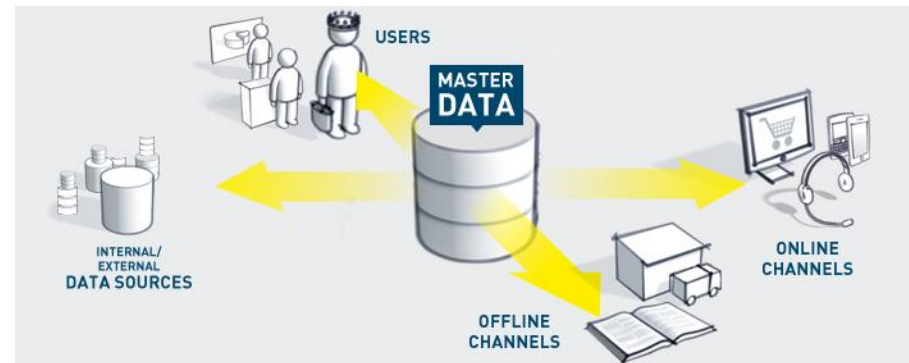
- Business operates off 2 SAP instances
- UK system requires new material code for each product revision -> Use of a High Level Code to link similar materials
- CE system does not have this requirement
- Introduction of Group HLC Code

*Passionate
about
Private Label*



Implementation of APO DP – Master Data

- Master data setups different across both systems
- Group Master Data Attribute project to introduce standard master data platform for consistency in APO
- Characteristics
 - Sold to / Customer Group / Sales Org
 - High Level Code / Material / Forecast Code / Brand(&Owner)
 - Delivery Plant
- Attributes
 - Product Hierarchy / Volume
 - Brand Segmentation
 - Product Lifecycle Status

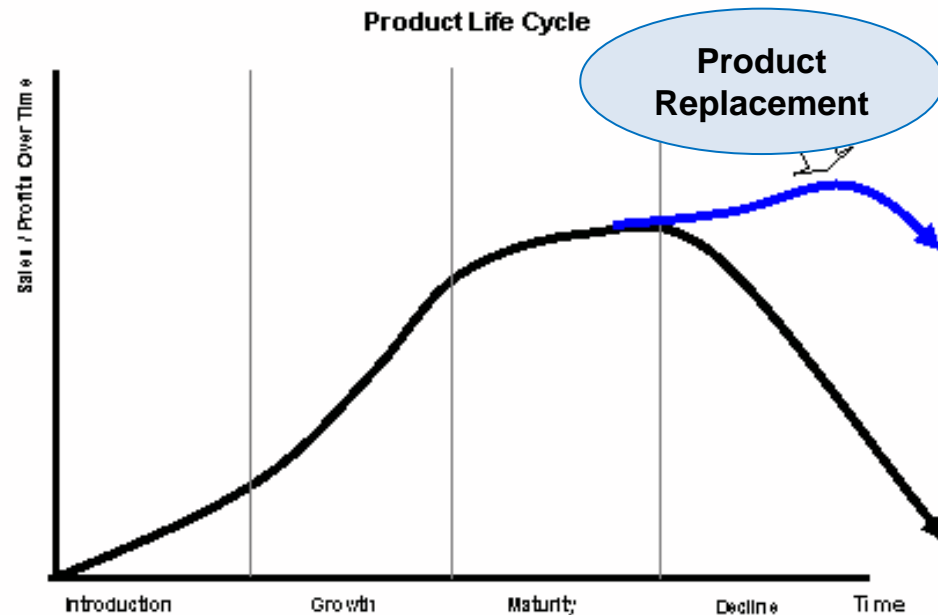


Private Label



Implementation of APO DP – Product Lifecycle Mgt

- Transfer forecast at level of material and delivery plant into R/3
- Forecast needs to be accurate at material level
- Integration of Product Lifecycle information into the forecast
- System work in R/3 and integration with APO
- Known as “Events”
 - Start Events
 - Stop/Start Events
 - Stop Events



*Passionate
about
Private Label*



Implementation of APO DP – APO Setup



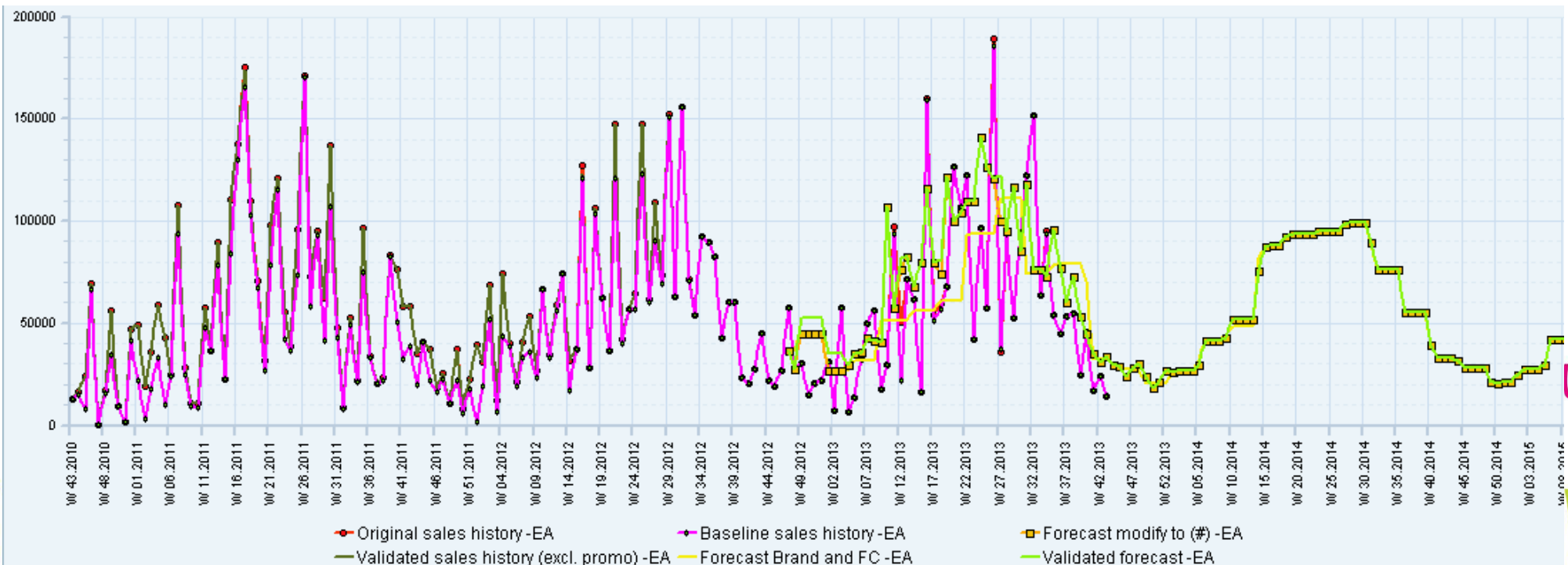
- Time Buckets set as weekly or monthly
- Historical View
 - Amendments of Sales History
 - Promotional Sales
 - Integration of Events

HISTORIC SALES	Unit	W 31.2013	W 32.2013	W 33.2013	W 34.2013	W 35.2013	W 36.2013	W 37.2013
Original sales history	EA	1,414,846	1,013,725	1,233,310	1,130,377	1,179,718	1,310,637	1,184,380
Debit / Credit (+/-)	EA	-15,574				-19,509	-1,987	-840
Sales history adjustment (+/-)	EA	888	10,200	-1,000	4,434	5,940	4,950	4,950
Validated sales history (incl. promo)	EA	1,400,160	1,023,925	1,232,310	1,134,811	1,166,149	1,313,600	1,188,490
Promotional sales	EA	315,047	-79,972	150,467	151,905	157,079	204,788	112,029
Validated promo	EA	279,466	299,116	326,484	211,116	284,925	151,015	302,540
EPOS	EA							
Closed orders	EA	1,457,009	1,047,979	1,274,178	1,155,313	1,279,767	1,373,123	1,221,978
Validated sales history [Y-1] (excl. promo)	EA	859,000	779,118	867,528	790,693	645,242	846,509	833,796
Validated sales history (excl. promo)	EA	1,085,113	1,103,897	1,081,843	982,906	1,009,070	1,108,812	1,076,461
Baseline sales history	EA	887,714	857,317	936,760	919,805	917,641	1,045,994	1,005,954
Flag clear sales		811	774	762	815	811	819	814

Implementation of APO DP – APO Setup



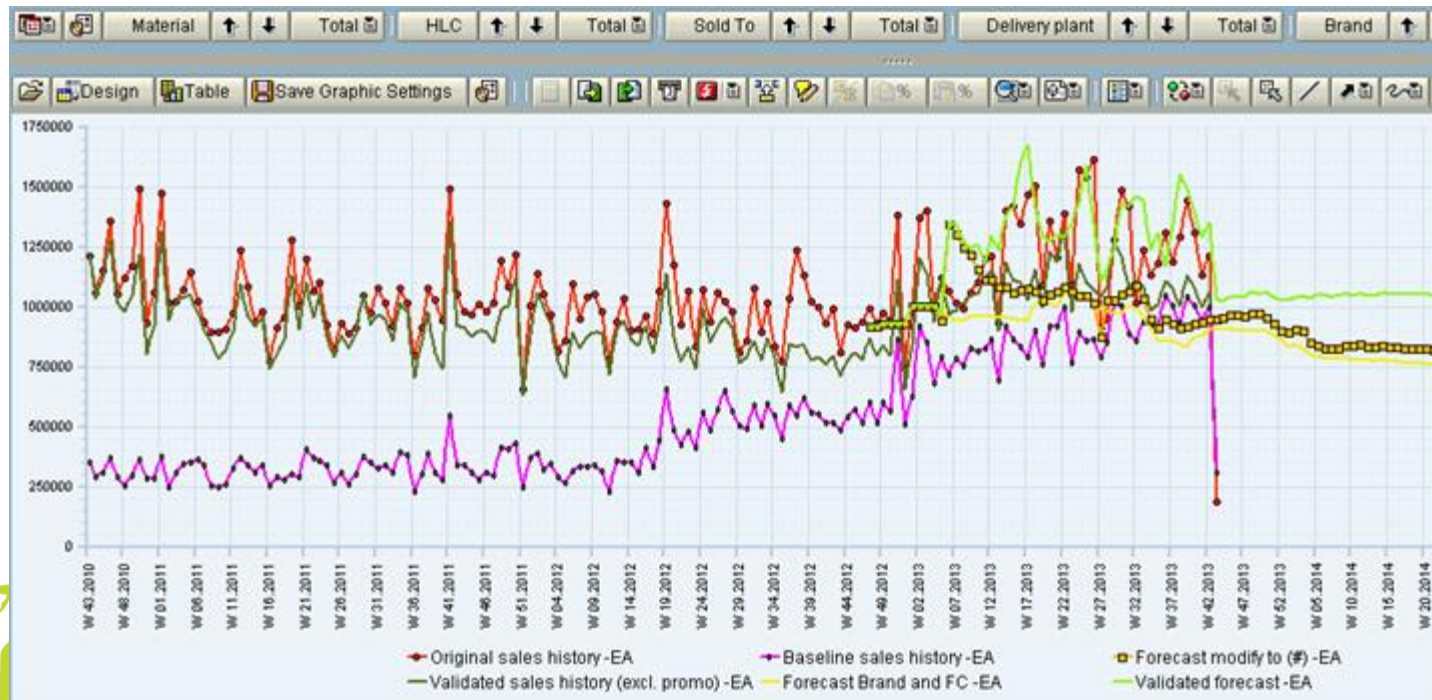
- Statistical Forecast
 - Exponential Smoothing to Start with, now moving to more complex structure
 - Two tier model to maximise bottom up in a top down forecast



Implementation of APO DP – APO Setup



- Amendments
 - Manual Intervention
 - **Integration of Events**
 - Promotions
- Use standard functionality showing proposed and confirmed promotions



Passionate
about
Private Label



Promotional Sales



- Promotional sales need to be removed from historical sales to ensure a reliable and accurate baseline statistical forecast can be created.
- McBride conduct in excess of 1500 promotions a month so that creates a significant workload.
- The manual method of adjusting sales history can be subjective creating a non standard result, in addition the motivation for correcting “small” promotions is low.
- We wanted to find a way to automate this activity to reduce manual workload and give a standardised result.
- This is how we did it....

*Passionate
about
Private Label*



Promotional Sales – Key Figures



	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Statistical Forecast					
Modified Forecast					
Promotion					
Validated Forecast					
Original Sales					
Promotional Sales					
Sales ex Promo					

*Passionate
about
Private Label*



Promotional Sales – Demand Plan



	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Statistical Forecast	1000	1050	1100	1150	1200
Modified Forecast			1300	1350	1400
Promotion		500	700	300	
Validated Forecast	1000	1550	2000	1650	1400
Original Sales					
Promotional Sales					
Sales ex Promo					

*Passionate
about
Private Label*



Promotional Sales – Actual Sales



	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Statistical Forecast	1000	1050	1100	1150	1200
Modified Forecast			1300	1350	1400
Promotion		500	700	300	
Validated Forecast	1000	1550	2000	1650	1400
Original Sales	900	1400	2100	1100	1500
Promotional Sales					
Sales ex Promo					

*Passionate
about
Private Label*



Promotional Sales – Calculation of Promo Sales



	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Statistical Forecast	1000	1050	1100	1150	1200
Modified Forecast			1300	1350	1400
Promotion		500	700	300	
Validated Forecast	1000	1550	2000	1650	1400
Original Sales	900	1400	2100	1500	1500
Promotional Sales	0	350	800	200	0
Sales ex Promo	900	1050	1300	1350	1500

*Passionate
about
Private Label*



Promotional Sales – An interesting side effect



	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Statistical Forecast	1000	1050	1100	1150	1200
Modified Forecast			1300	1350	1400
Promotion		500	700	300	
Validated Forecast	1000	1550	2000	1650	1400
Original Sales	900	1400	2100	1100	1500
Promotional Sales	0	350	800	-250	0
Sales ex Promo	900	1050	1300	1350	1500

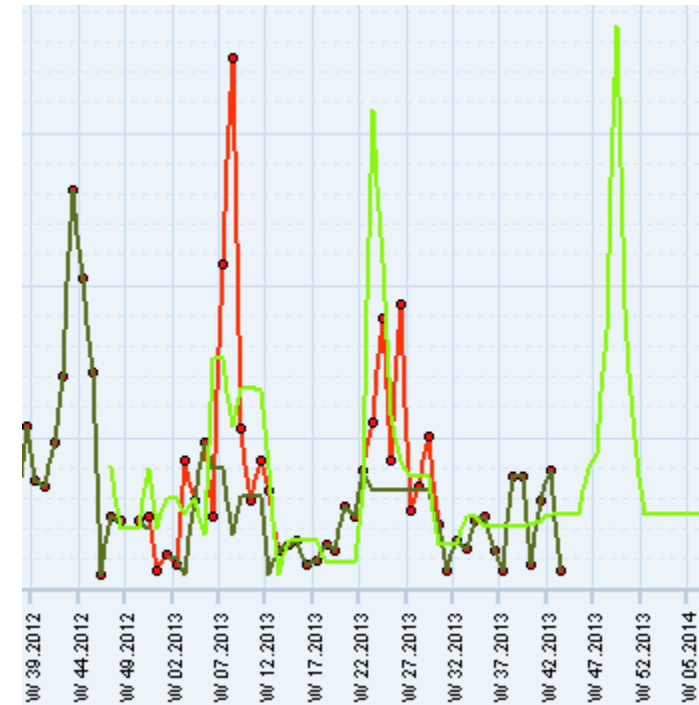
Passionate
about
Private Label



Promotional Sales – In practice



- 1st promo not modified
- 2nd & 3rd reduced automatically
- 4th promo planned in
- Negative sales showing where promotion drove sales lower than standard level
- These should be netted off the total “success” of the promotion for future analysis



HISTORIC SALES	Unit	W 22.2013	W 23.2013	W 24.2013	W 25.2013	W 26.2013	W 27.2013	W 28.2013	W 29.2013	W 30.2013
Original sales history	EA	7,776	11,016	17,820	8,424	18,792	5,184	6,804	10,044	4,212
Validated sales history (incl. promo)	EA	7,776	11,016	17,820	8,424	18,792	5,184	6,804	10,044	4,212
Promotional sales	EA		4,550	11,354	1,958	12,326	-1,280	340	3,580	
Validated promo	EA	0	25,000	15,000	5,000	2,000	1,000	1,000	1,000	0
Closed orders	EA	7,776	11,016	17,820	9,396	18,792	6,480	11,340	10,044	4,212
Validated sales history (excl. promo)	EA	7,776	6,466	6,466	6,466	6,466	6,464	6,464	6,464	4,212



Maximising the quality of the statistical forecast



- Forecasting at an aggregated level reduces the noise in the sales history and thereby creates an improved statistical forecast.
- For McBride we aggregate to the level of Brand and Product Type to create our forecasts (works well for both Private Label & Branded SKU's)
- However, when the forecast is disaggregated down to the lower levels each CVC has a fixed proportion of the forecast across all time buckets. This “loses” knowledge available in the sales history at the lower level.
- We wanted to find a way to overcome this issue and this is how we did it...

*Passionate
about
Private Label*



Single Tier Forecast



	Sales History					Forecast				
	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10
Aggregated Forecast	1700	1500	1900	1600	1750	1750	1770	1790	1810	1830
Proportions - A	500	400	450	300	350	19%	19%	19%	19%	19%
Proportions - B	200	300	250	400	450	25%	25%	25%	25%	25%
Proportions - C	1000	800	1200	900	950	55%	55%	55%	55%	55%
Result Forecast - A						340	343	347	351	355
Result Forecast - B						444	449	454	459	464
Result Forecast - C						966	977	989	1000	1011

*Passionate
about
Private Label*



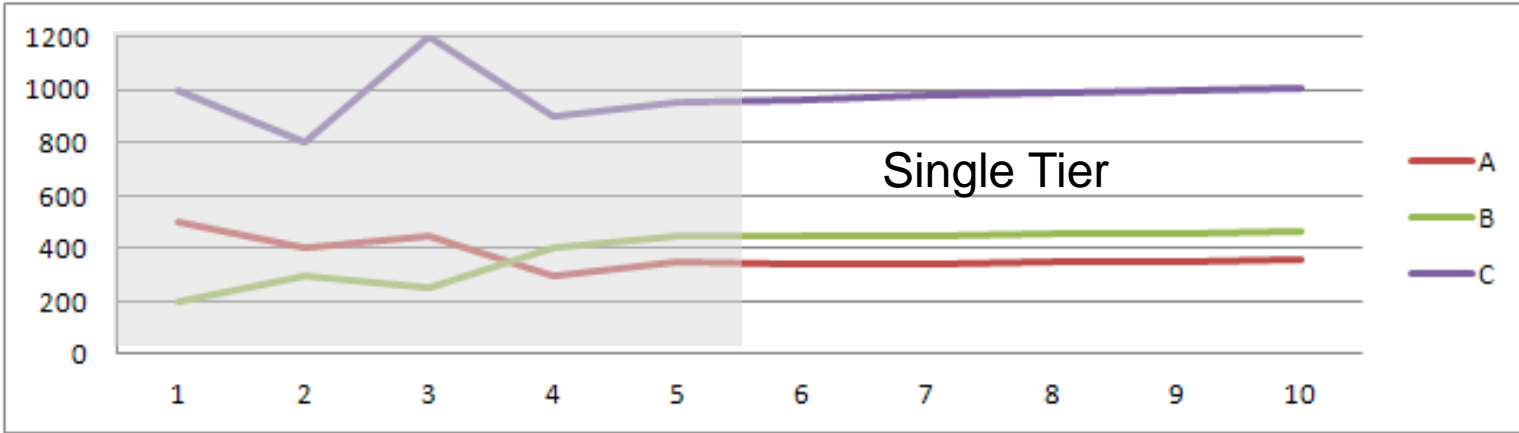
Two tier forecast

	Sales History					Forecast				
	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10
Aggregated Forecast	1700	1500	1900	1600	1750	1750	1770	1790	1810	1830
Detailed Forecast - A	500	400	450	300	350	340	320	300	280	270
Detailed Forecast - B	200	300	250	400	450	400	410	420	430	440
Detailed Forecast - C	1000	800	1200	900	950	970	970	970	970	970
Proportions - A						20%	19%	18%	17%	16%
Proportions - B						23%	24%	25%	26%	26%
Proportions - C						57%	57%	57%	58%	58%
Result Forecast - A	500	400	450	300	350	348	333	318	302	294
Result Forecast - B	200	300	250	400	450	409	427	445	463	479
Result Forecast - C	1000	800	1200	900	950	993	1010	1027	1045	1057

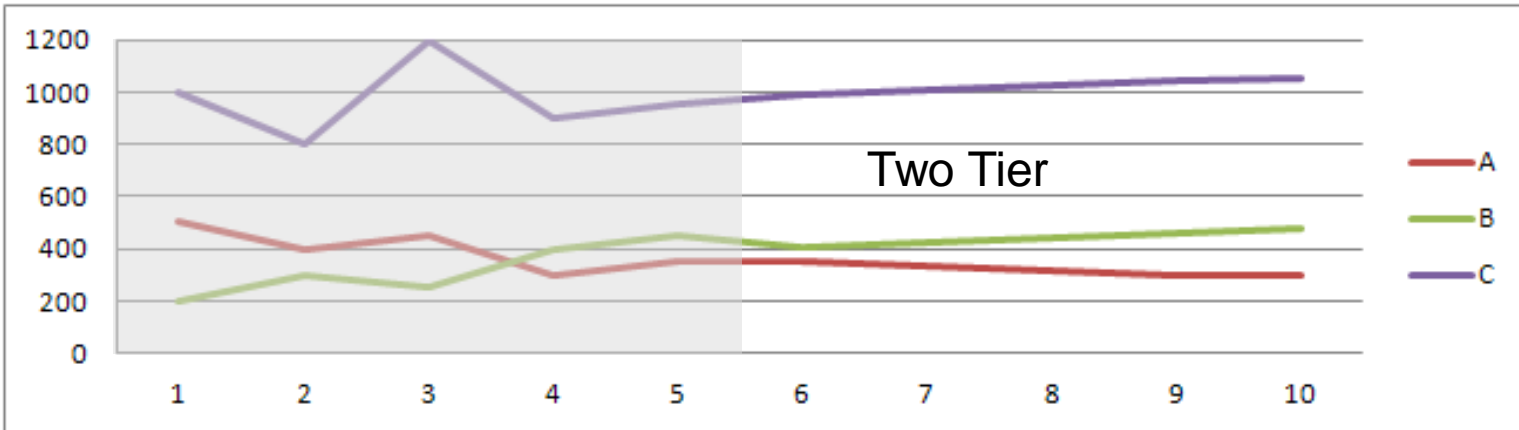
Private Law



Comparison of Results



All levels of disaggregation forced to follow same shape. Proportions fixed in all time buckets



Lower levels free to take different shapes. Proportions can adapt across time

Passionate about Private Label



However.....

- The trend model is too volatile especially with small sales histories or intermittent sales, although we have seen good results in testing we have also seen too many problems
- So we currently don't set the forecast at the lower level to anything other than the constant model
- Now we see issues in not being able to use this two tier model
- This is an example of the issues we see..

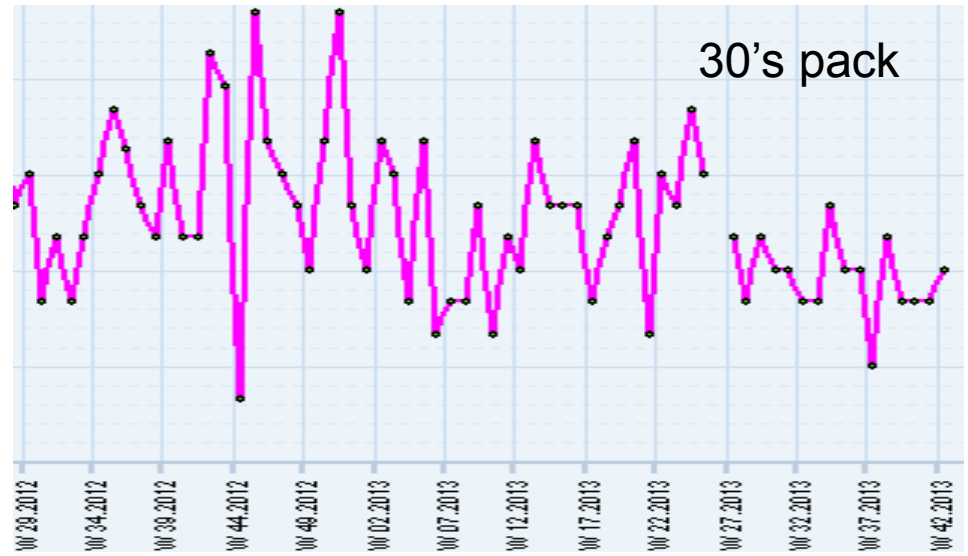


dreamstime.com

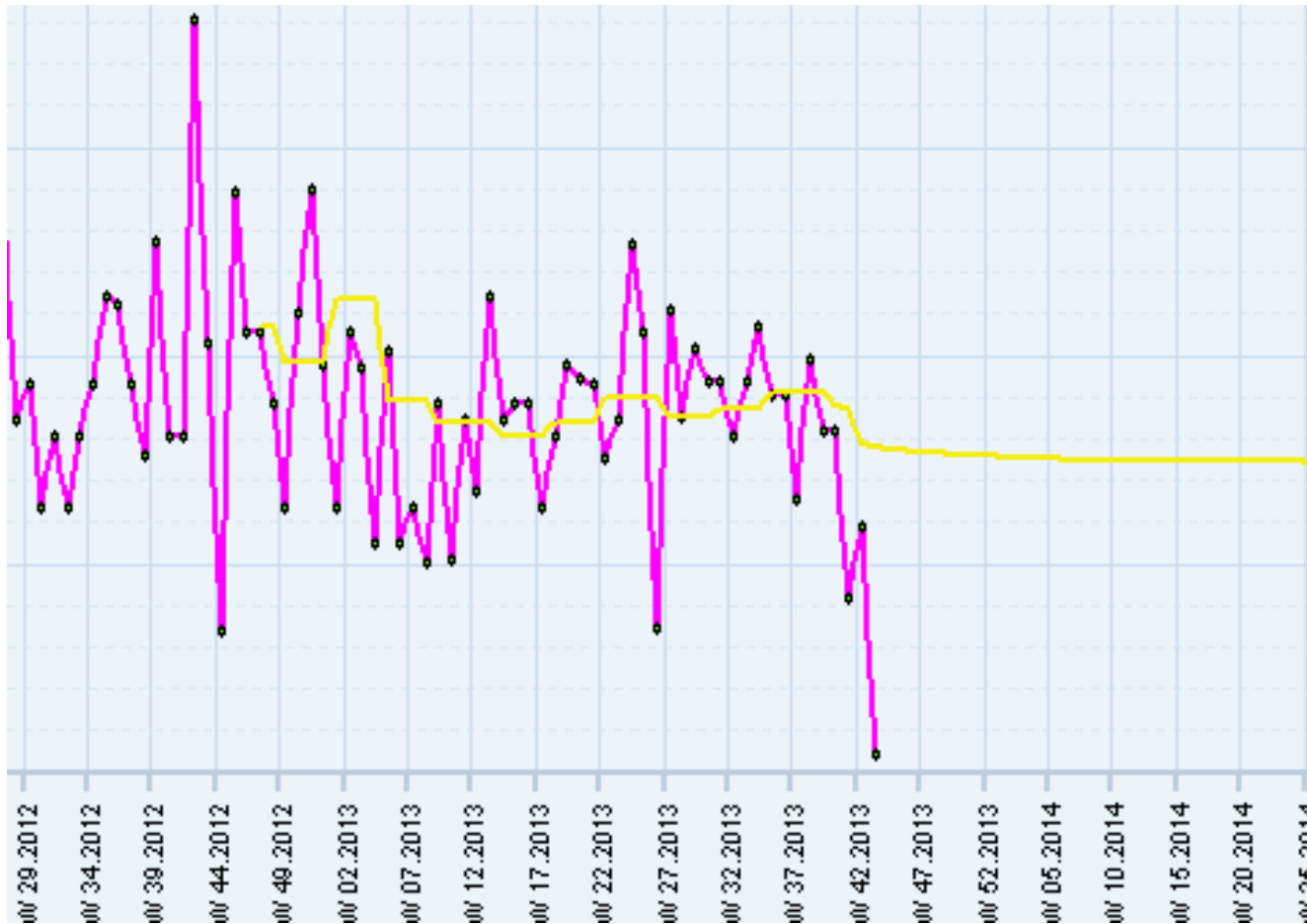
*Passionate
about
Private Label*



Sales Histories at SKU level



Statistical Forecast at Brand / Product Type



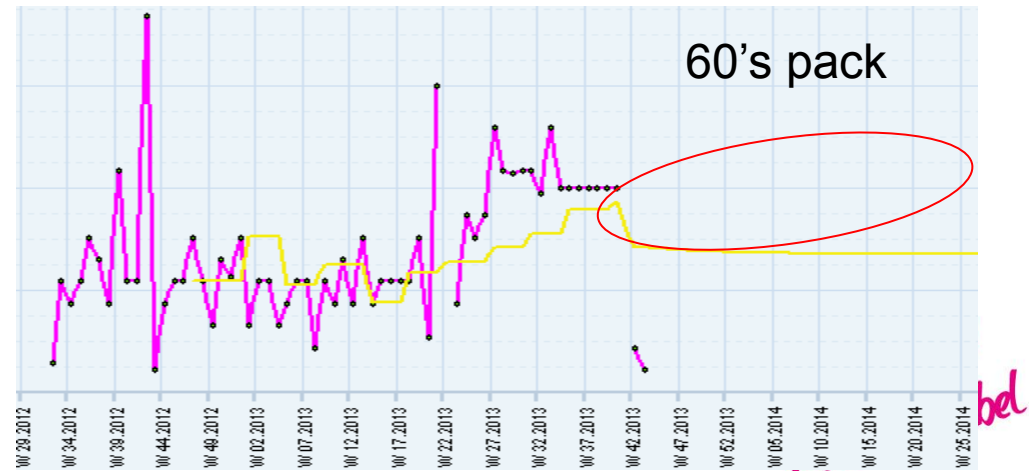
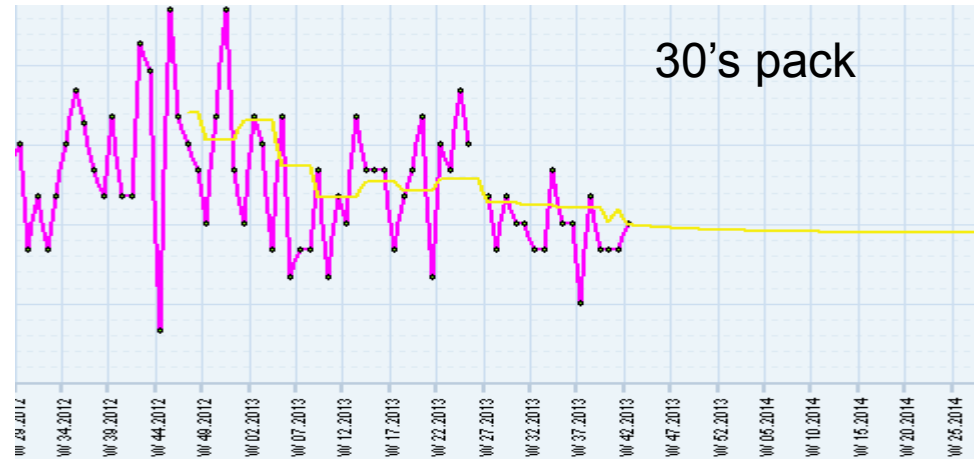
Forecast created by
Trend model using
2nd Order Exponential
Smoothing (22)
Alpha 0.05
Alpha 2 0.10
Sigma 0.90

- At an aggregated level forecast looks good

*Passionate
about
Private Label*



Stat Forecast at Brand / Product Type



Product Lifecycle Events Integration



- Private label FMCG suffers from relatively short product lifecycles and these are managed by Product Lifecycle teams.
- There are approx 30 people in product lifecycle teams across Europe looking after different customers and geographies.
- If we consider the critical time for product lifecycle to be the first and last 3 months of a products life we have approx 1500 -2000 products that are involved in product lifecycle management at any point in time.
- It wasn't practical to use the standard functionality so we needed a way of integrating the information and allowing split ownership of the forecast around the event dates.
- This is how we did it....

*Passionate
about
Private Label*



Start Events

- Start events: For new product launches Start dates and volumes are controlled by the event tool and integrated into DP.

Event Case Details

Event Description	LAVTROP	Event ID	10000000004580
Event Type	Start Event	Event Status	Confirmed (APO Ready)
Plant Responsible	1010 RMB, Barrow	Last Changed Date	11.10.2013 00:49:02
Creation Date	09.10.2013 13:26:21	Last Changed By	APO Remote RFC
Case Owner		Saved Attachments	0

Event Details

Event (Case Item)	10	2 IN 1 LAVTROP	Sales unit	CAS
			Event Status	Live (Created/Confirmed)
Start Material	40039267	2 IN 1 LAV	HLC Start Mat	70016272
Start Matl Ship Dt	07.01.2014	02.2014	Forecast Profile	M Entered pipeline/phasing q...
		APO Control Week		

Forecast Level Info

Ev	C	AP	Deli	Sold-to party	D	D	Sal	St	Start Material	Ship Date	Start W	Base Qty	Sa	Wk 1	Wk 2	Wk 3	Wk 4	W
10	10		1094		20	99	1000	<input checked="" type="checkbox"/>	40039267	07.01.2014	02.2014	61	CAS	183		61	61	61

Inmate about rate Label



Start Events



- Start events: For new product launches Start dates and volumes are controlled by the event tool and integrated into DP. User fields in DP are locked to prevent overlaps

FORECASTING	Unit	W 52.2013	W 01.2014	W 02.2014	W 03.2014	W 04.2014	W 05.2014	W 06.2014	W 07.2014
Forecast Brand and FC	EA								
Forecast modify to (#)	EA	0	0	0	0	0	0	0	0
Forecast after modification	EA								
Flag modify to (#)									
Calculated proportional factor		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
McBride APODPDANT	EA								
Ex-post forecast	EA								
Start quantity	EA			35,136		11,712	11,712	11,712	11,712
Validated promo	EA	0	0	0	0	0	0	0	0
Validated forecast	EA	0	0	35,136	0	11,712	11,712	11,712	11,712

Private Label



Stop Events

- Stop events: For products which are being withdrawn Stop dates (and final delivery volumes) are passed from the event tool and integrated into DP.

Event Details

Event (Case Item) 101 #12X750 BLEACH Sales unit CAS

Stop Material 40038108 #12X750 CITRUS THICK BLEACH Event Status Live (Created/Confirmed)

Target End Date Stop Complete Ind. HLC Stop Mat 70014169

Potential Liability 14.08 GBP Final Liability Requested Event Plan Item Least Cost

Actual Liability 0.00 Zero Liab.

Sales Details

Accepted Sales Qty 0 CAS Total liq. complete

Extra Sales Qty 0

Est. Liq. End Week 05.2014 27.01.2014

Sales Remaining Qty 13

End Liq. Last Calc. 22.10.2013 14:00:18

Last Liq. Calc Qty 2,880 Complete Early

Production Details

Event Start Date 22.10.2013 Event Start Week 43.2013

Proposed Sales Qty 2,880

Minimum Extra Qty 0

Round Up Quantity 0

Renewal Time (Wks) 0 Prod. Review

Early Compl. Date

Forecast Level Info

Ev	C	AP	Deli	Sold-to party	D	D	Sal	St	Pa	Stop Material	End Date	End We	Sa
10	10	✓	1094		20	99	1000	✓		40038108	27.01.2014	05.2014	CAS
10	20	✓	1094		20	99	1000	✓		40038108	27.01.2014	05.2014	CAS
10	30	✓	1094		20	99	1000	✓		40038108	27.01.2014	05.2014	CAS

Inate about vate Label



Stop Events



- Stop events: For products which are being withdrawn Stop dates (and final delivery volumes) are passed from the event tool and integrated into DP.

FORECASTING	Unit	W 01.2014	W 02.2014	W 03.2014	W 04.2014	W 05.2014	W 06.2014	W 07.2014	W 08.2014
Forecast Brand and FC	EA	2,798	2,799	2,799	2,799				
Forecast modify to (#)	EA	2,798	2,799	2,799	707	156	0	0	0
Forecast after modification	EA	2,798	2,799	2,799	707	156			
Flag modify to (#)					1	1			
Calculated proportional factor		1.967	1.967	1.967	1.967	1.967	1.967	1.967	1.967
McBride APODPDANT	EA								
Ex-post forecast	EA								
Start quantity	EA								
Validated promo	EA	0	0	0	0	0	0	0	0
Validated forecast	EA	2,798	2,799	2,799	707	156	0	0	0

Passionate
about
Private Label



Stop/Start Events

- For soft launches proportional factors are manipulated and the forecast redisaggregated to move forecast onto the correct material in the correct time bucket.

Event Details																
Event (Case Item)		[10] #6X250			INTENSIVE ...			Sales unit		CAS		Event Status			Live (Created/Confirmed)	
Stop Material		40037256 #6X250			INTENSIVE			HLC Stop Mat		70014768		Event Plan Item			Least Cost	
Target End Date		10.11.2013 45.2013			<input type="checkbox"/> Stop Complete Ind.			HLC Start Mat		70014768		Forecast Profile			H Use sales history (stop ma ...)	
Start Material		40039100 #6X250			INTENSIVE			APO Control Week		0		Actual Liability			0.00 <input type="checkbox"/> Zero Liab.	
Start Matl Ship Dt								Final Liability Requested		<input type="checkbox"/>						
Potential Liability		20.00														
Sales Details							Production Details									
Accepted Sales Qty		0 CAS			<input type="checkbox"/> Total liq. complete			Event Start Date		13.08.2013		Event Start Week			33.2013	
Extra Sales Qty		0						Proposed Sales Qty		4,521		Minimum Extra Qty			0	
Est. Liq. End Week		50.2014 13.12.2014						Round Up Quantity		0		Renewal Time (Wks)			0	
Sales Remaining Qty		0						Early Compl. Date				<input type="checkbox"/> Calc Est. End <input type="checkbox"/> Set Est. End <input type="checkbox"/> Prod. Review				
End Liq. Last Calc.		19.08.2013 08:33:29						Complete Early		<input checked="" type="checkbox"/>						
Last Liq. Calc Qty		4,521														
Forecast Level Info																
<div style="display: flex; justify-content: space-between;"> [Icons] [Icons] [Icons] </div>																
Ev	C	AP	Deli	Sold-to party	D	D	Sal	St	Pa	Stop Material	End Date	End We	St	Start Material	Sa	
10	10	<input checked="" type="checkbox"/>	1020		20	99	1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	40037256	13.12.2014	50.2014	<input checked="" type="checkbox"/>	40039100	CAS	

note about rate Label

Stop/Start Events

- For soft launches proportional factors are manipulated and the forecast redisaggregated to move forecast onto the correct material in the correct time bucket.

FORECASTING		Material	Unit	W 47.2014	W 48.2014	W 49.2014	W 50.2014	W 51.2014	W 52.2014	W 01.2015
Forecast modify to (#)	Total	EA	300	300	300	300	300	300	300	300
	40037256 / #6X250 PRO F...	EA	300	300	300	300	0	0	0	
	40039100 / &6X250 PRO ...	EA	0	0	0	0	300	300	300	
Forecast after modification	Total	EA	300	300	300	300	300	300	300	
	40037256 / #6X250 PRO F...	EA	300	300	300	300				
	40039100 / &6X250 PRO ...	EA					300	300	300	
Flag modify to (#)	Total		1	1	1	1	1	1	1	
	40037256 / #6X250 PRO F...		1	1	1	1				
	40039100 / &6X250 PRO ...						1	1	1	
Calculated proportional factor	Total		0.150	0.150	0.150	0.150	0.150	0.150	0.150	
	40037256 / #6X250 PRO F...		0.150	0.150	0.150	0.150	0.000	0.000	0.000	
	40039100 / &6X250 PRO ...		0.000	0.000	0.000	0.000	0.150	0.150	0.150	
McBride APODPDANT	Total	EA	-0.850	-0.850	-0.850	-0.850	-0.850	-0.850	-0.850	
	40037256 / #6X250 PRO F...	EA	0.150	0.150	0.150	0.150	-1.000	-1.000	-1.000	
	40039100 / &6X250 PRO ...	EA	-1.000	-1.000	-1.000	-1.000	0.150	0.150	0.150	

the Label

The future



- This month we have set up the statistical forecast to use multiple algorithms. This will start to give us better results but we have been surprised by some of the forecasts DP has generated.
- This leads to the next piece of work – can we improve the forecast using the standard models or should we build our own?
- We want to use the alerts more significantly to reduce the time forecasters spend reviewing the forecast.
- We will continue to develop our forecasting process and make sure we are standardised across the group in our ways of working.

*Passionate
about
Private Label*

