

Demand-Driven Forecasting

Linked in

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Our Services

- Training Programs
- Opportunity Assessment
- Business Transformation
- Package Selection
- On-Demand

Some of our clients....



Introduction

Who needs forecasting?



Forecasting Where?

- ▶ Time series forecasting is applicable to almost all organizations that work with quantifiable data.
 - ▶ Retail stores forecast sales
 - ▶ Energy companies forecast load and reserves, production, demand and prices
 - ▶ Educational institutions forecast enrollment
 - ▶ Passenger transport companies forecast future travel
 - ▶ Banks forecast new home purchases
 - ▶ Service companies forecast staffing needs
 - ▶ Hospitals forecast surgeries
 - ▶ FMCG forecast demand for their products
 - ▶ Other ...



Introduction: Recent Developments

Demand forecasting drives real value within the supply chain.

Demand-driven forecasting has become a discipline that senses, shapes and responds to the real demand.

Predictive analytics used to:

- Uncover patterns in consumer behavior.
- Measure effectiveness of marketing investment.
- Optimize financial performance.
- Shape and proactively drive demand using what-if simulations.
- Sense demand signals and shape the future demand supported by data mining technologies.

Predictive Analytics and Supply Chains

- Cost perceived too high
- Focus on investments that provide immediate and tangible results.
- Too complex to connect the data nodes across extended supply chain.
- Big data is a distraction at the moment.
- Skillsets in supply chain and IT are limited.
- Disconnect between the need and silo managed IT and other departments.
- Demand planning not a Core Competence.



Why Not



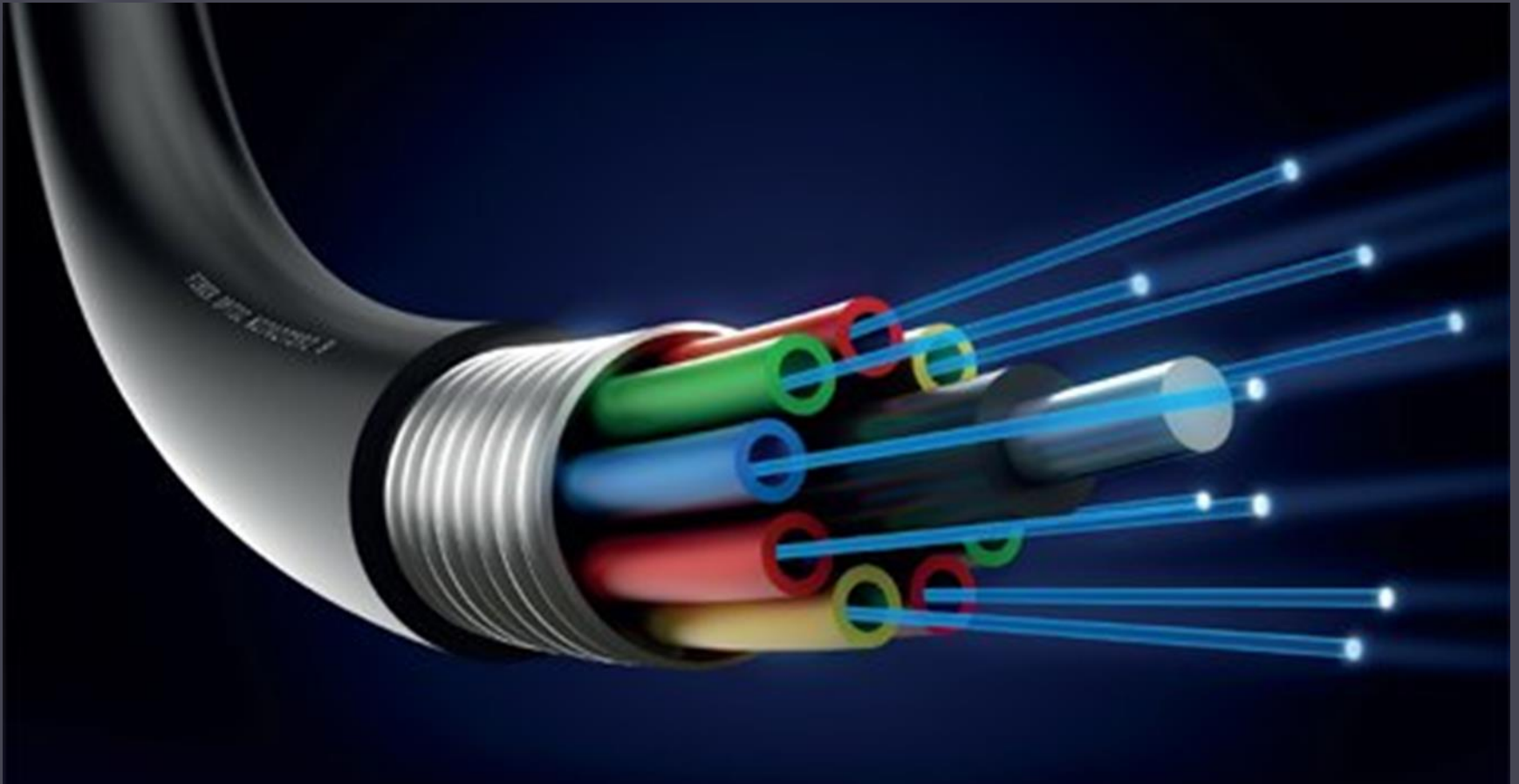
- Strong potential to transform the way in which supply chain managers lead and supply chains operate.
- Senior management's need to grow the business profitably.
- Multi-echelon supply chains require quick and correct signals to operate effectively.
- "Heads-up" to help sense, analyze, and better respond to market changes.
- Data equals information and information equals profit.
- Pressures to synchronize demand and supply to understand why consumers buy products.



Why Yes



Data Mining





Data Mining

▶ Descriptive analysis

- ▶ **Association** - looking for patterns where one event is connected to another event.
- ▶ **Sequence or path analysis** - looking for patterns where one event leads to another later event.
- ▶ **Classification** - looking for new patterns. (May result in a change in the way the data is organized but that's ok.)
- ▶ **Clustering** - finding and visually documenting groups of facts not previously known.

▶ Predictive analysis

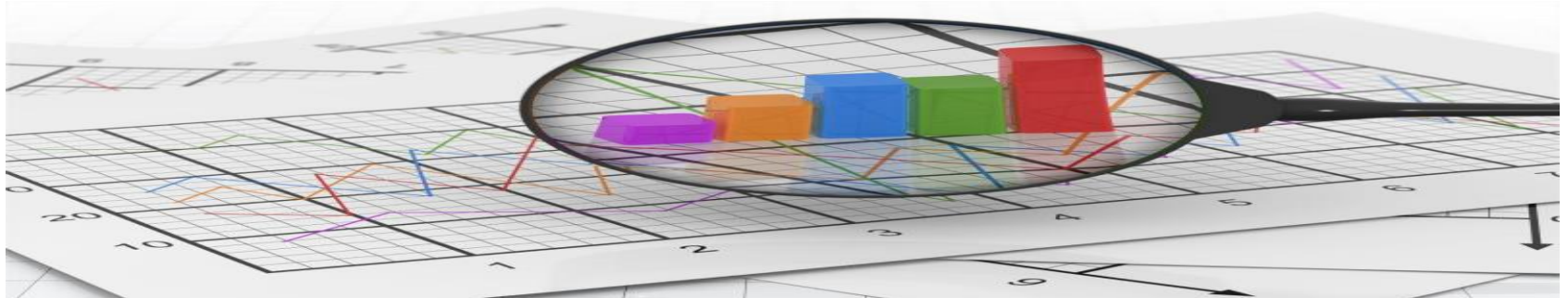
- ▶ **Forecasting** - discovering patterns in data that can lead to reasonable predictions about the future (This area of data mining is known as predictive analytics.)

Data mining is sorting through data to identify patterns and to establish relationships.



Managing by Analytics

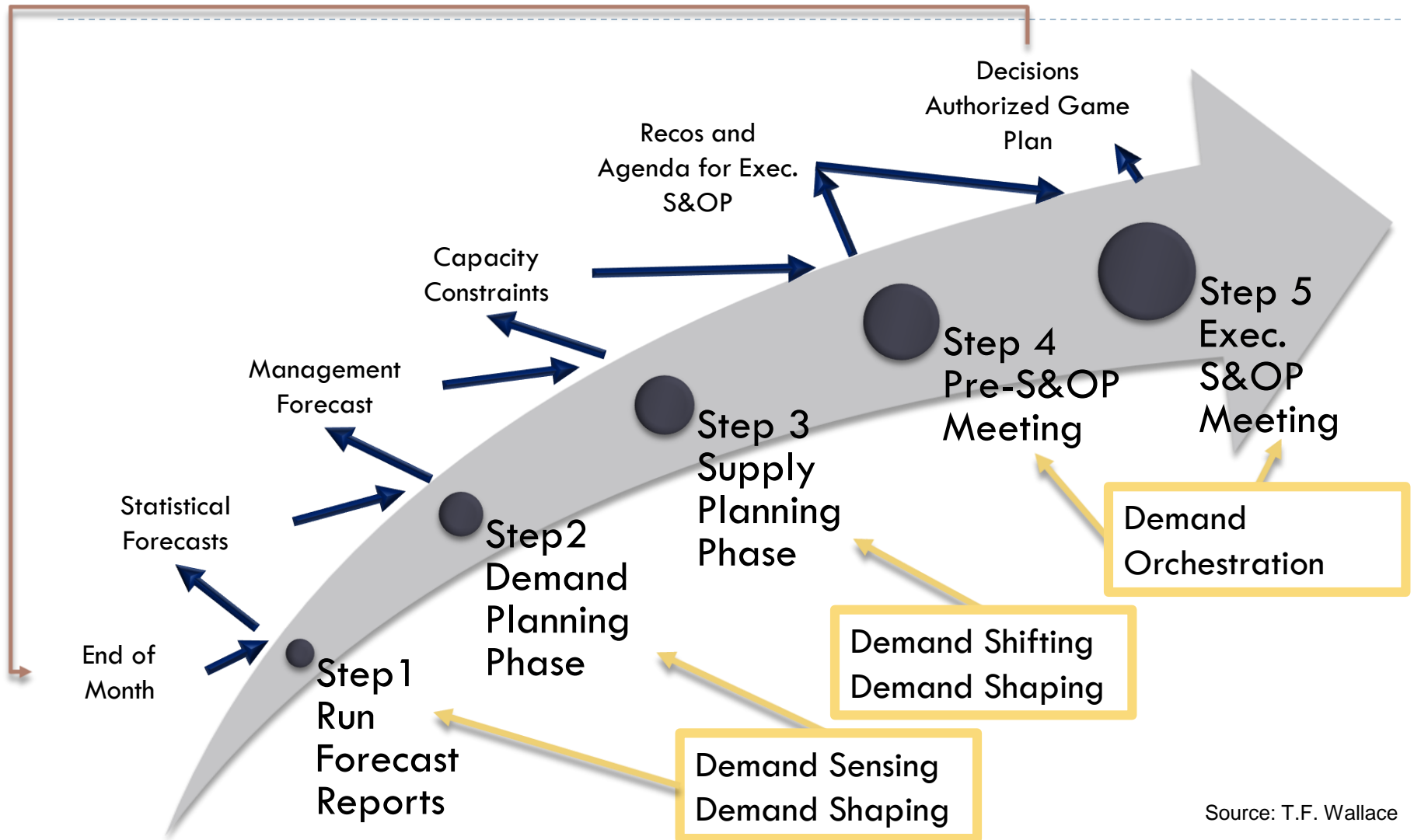
- ▶ Analytics resolve differences of opinion.
- ▶ Initial discussion based on opinions but has to be supported by numbers.
- ▶ Cross-functional involvement to improve alignment.
- ▶ Typically, managing by analytics is a **MAJOR CHANGE**.
- ▶ Teams work best when analytics rule discussion.



Demand-Driven Forecasting & Supply Chain

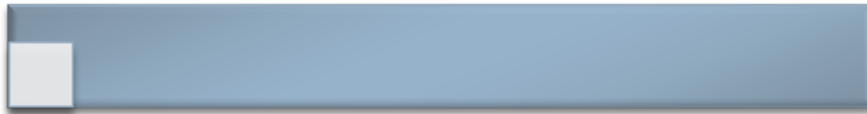


Monthly Demand-Driven S&OP Process



Source: T.F. Wallace

Traditional



- Static analytical methods based on trend and seasonality.
- Aggregate level (SKU national, SKU market, ...)
- Manual overrides to history and/or future – judgemental approach.
- Standalone product generation strategies and rigid monthly process.
- Does not capture changing market dynamics.

Demand-Driven

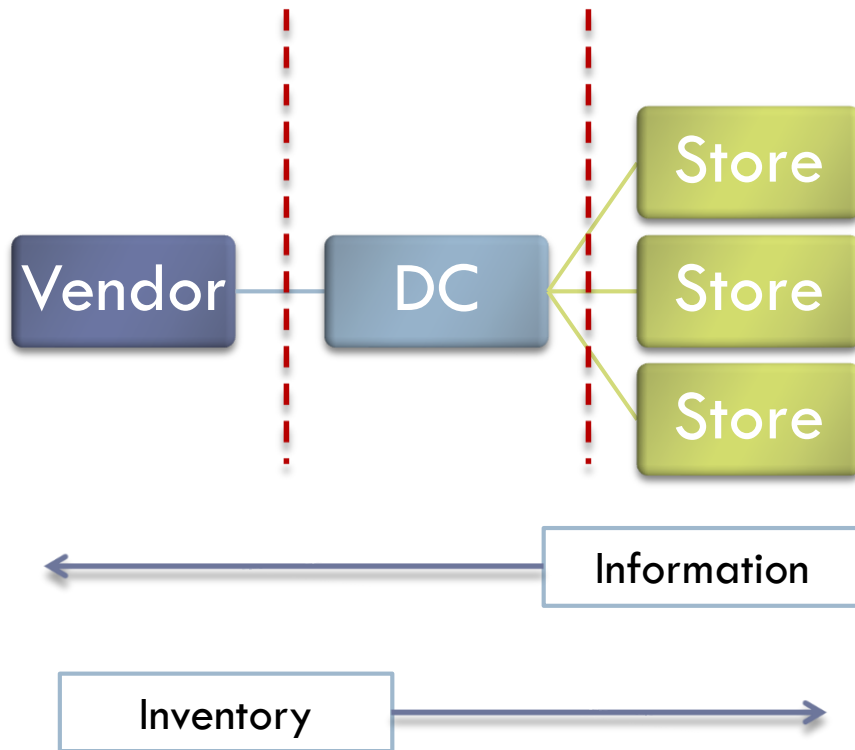


- Shift from trend and seasonality to dynamic demand signals
- Focus on demand-driven framework of shaping and sensing, and orchestrating demand across products, geographies, channels, and customers.
- Integrated, focused, analytic-driven process supported by predictive analytics, market intelligence, more sophisticated technologies.
- 'Real-time' forecasting based on market volatility and dynamics – sensing demand signals weekly and managing demand orchestration daily for rapidly changing markets.

What is Demand-Driven Forecasting?

Inside-out (Push) strategy issues

“If replenishment takes care of inventory problems, what caused the inventory problems in the first place?”



- ▶ Downstream demand accumulated and presented as aggregate total.
- ▶ Delay in the initial demand from original customer.
- ▶ Service level need is an average.
- ▶ Upstream supply expected to be at 100% service level.

Supply Chain Trends... Evolution from Push to Pull

Push / Inside-Out

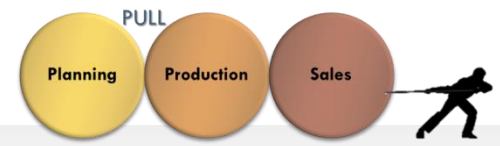
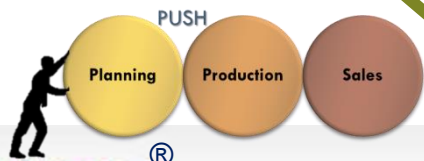
- ▶ SELL what you MAKE
- ▶ Is the demand the result of consumption at a stock point?
- ▶ Is the demand up or down the result of the downstream demand or the warehouse?
- ▶ How long does a forecast become obsolete?
- ▶ Does a signal become true when you believe it to be?
- ▶ Do we have enough time to react to demand when it finally becomes known?

Pull / Outside-In

- ▶ MAKE what you SELL
- ▶ From INSIDE to OUTSIDE
- ▶ It is not a channel, and products from manufacture to their

Current supply chains catch orders and shipments and assume that they are representative of the market.

Supply chain leaders can sense dynamics in the market and translate it through organization and alert the right person at the right time to make the right next action.



Data Analysis

Data Patterns – Attributes and Variables

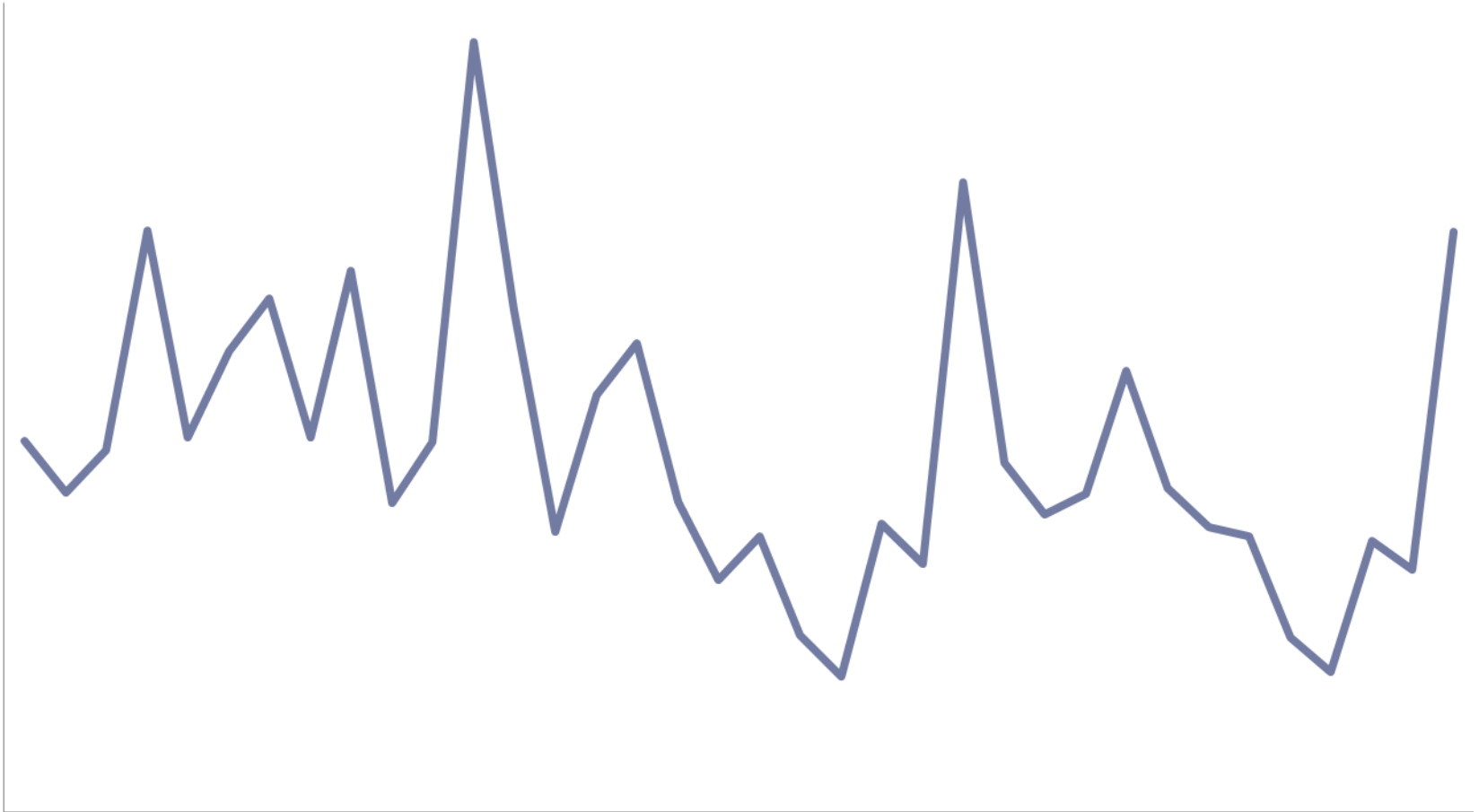


Application of SPC to Forecasting

- ▶ SPC (Statistical Process Control) focuses on Variables and Attributes in the dataset.
 - ▶ **Attributes data = specific values that we DO EXPECT in our data**
 - ▶ Level, Trend, Seasonality, Moving Holidays, Promotions, Competitive Activity, etc.
 - ▶ **Variable data = any value that we DO NOT EXPECT / WANT in our data**
 - ▶ Out-of-Stock, Trend Intervention, Irregularly Scheduled Promotion, Competitive Activity, Economics, etc.
- ▶ Normal Distribution - Control charts

Understanding Your Data

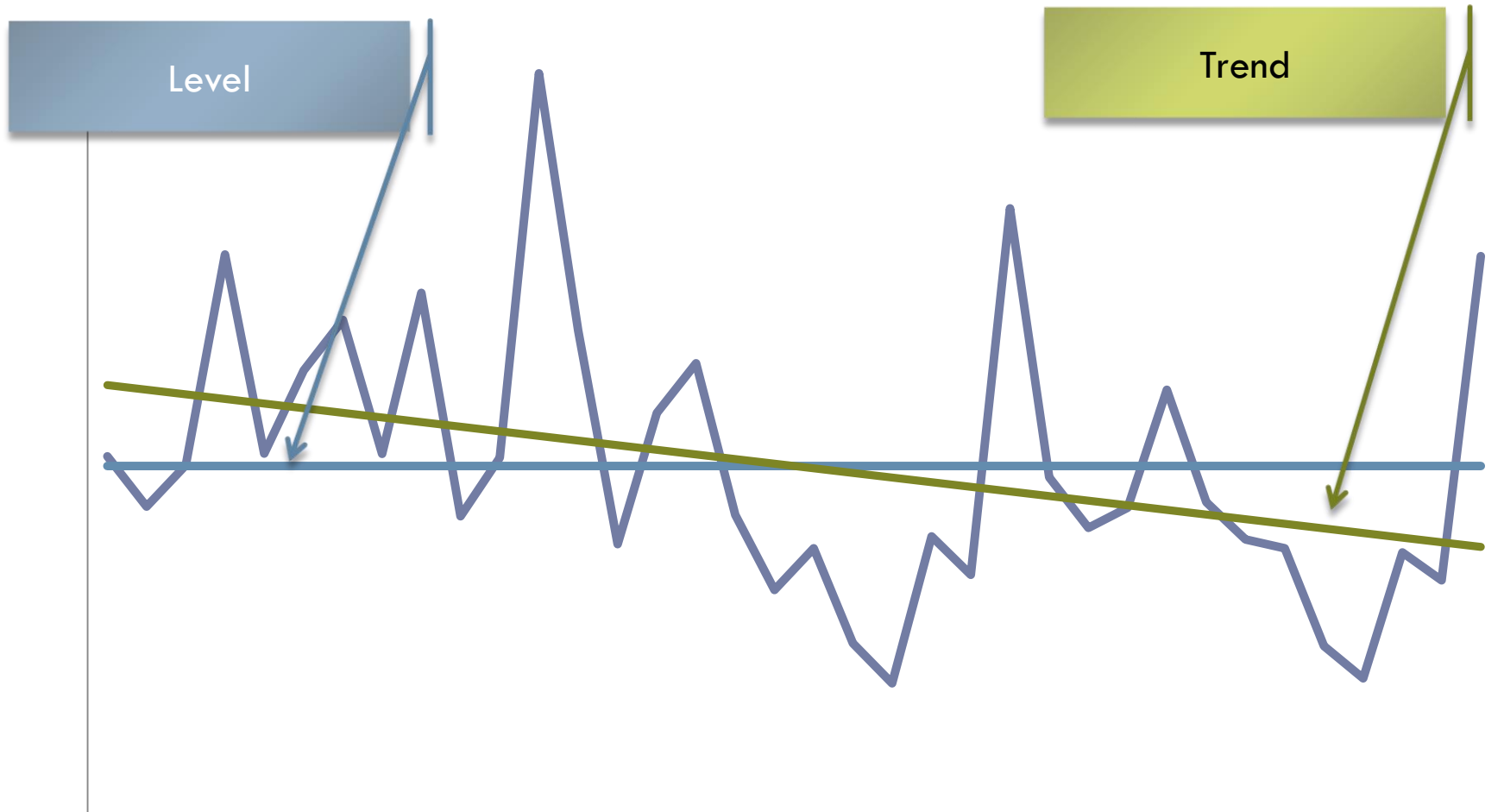
- ▶ Line graph is ideal for visualization of time series.



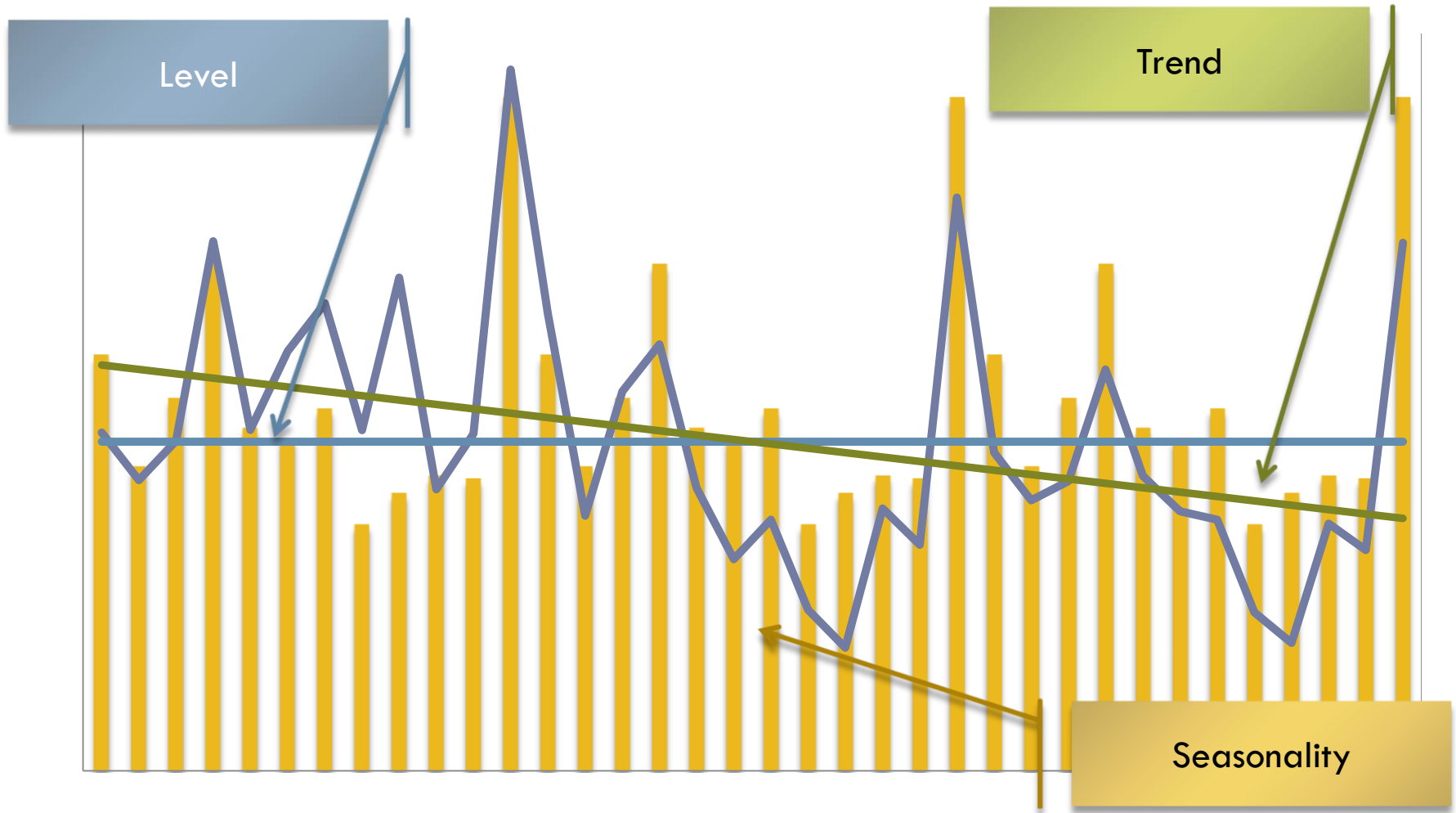
Recognizing Data Attributes



Recognizing Data Attributes

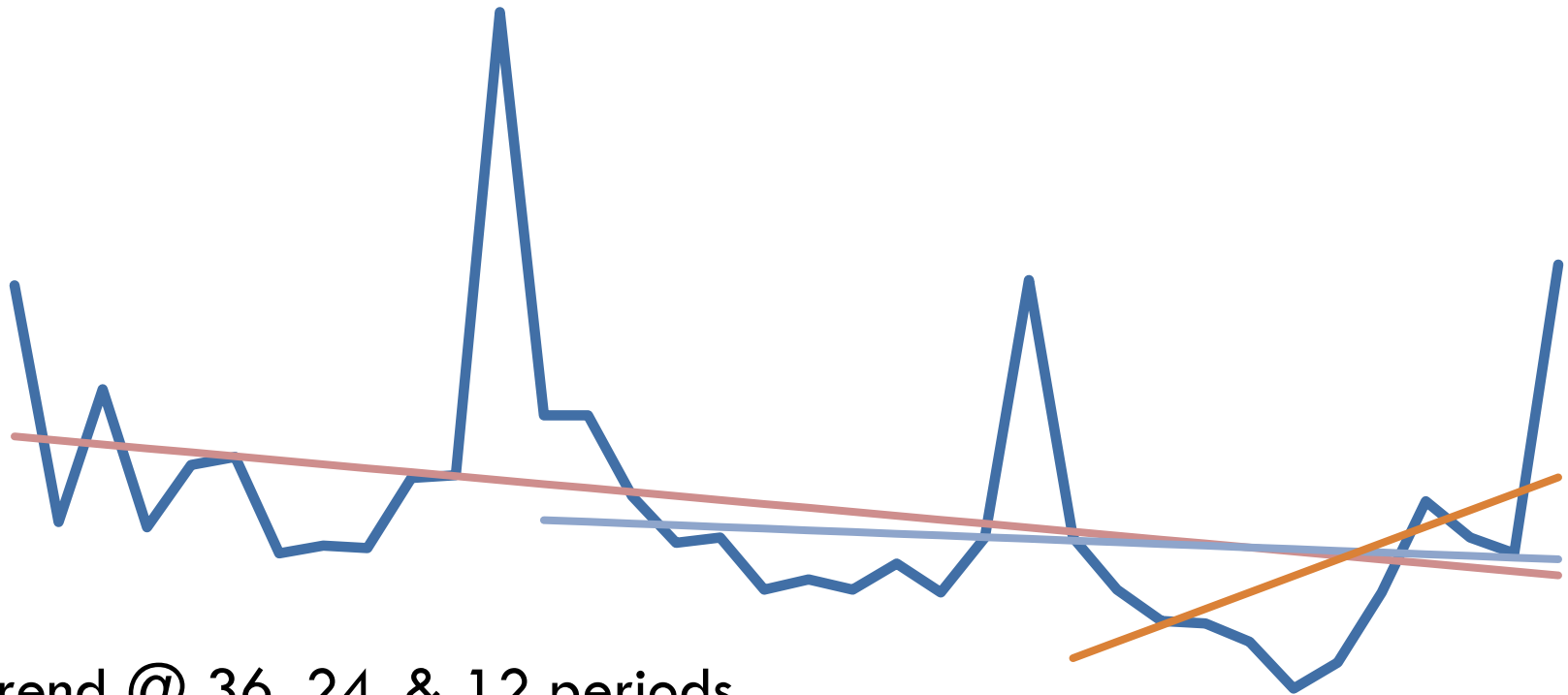


Recognizing Data Attributes



Recognizing Data Attributes & Variables

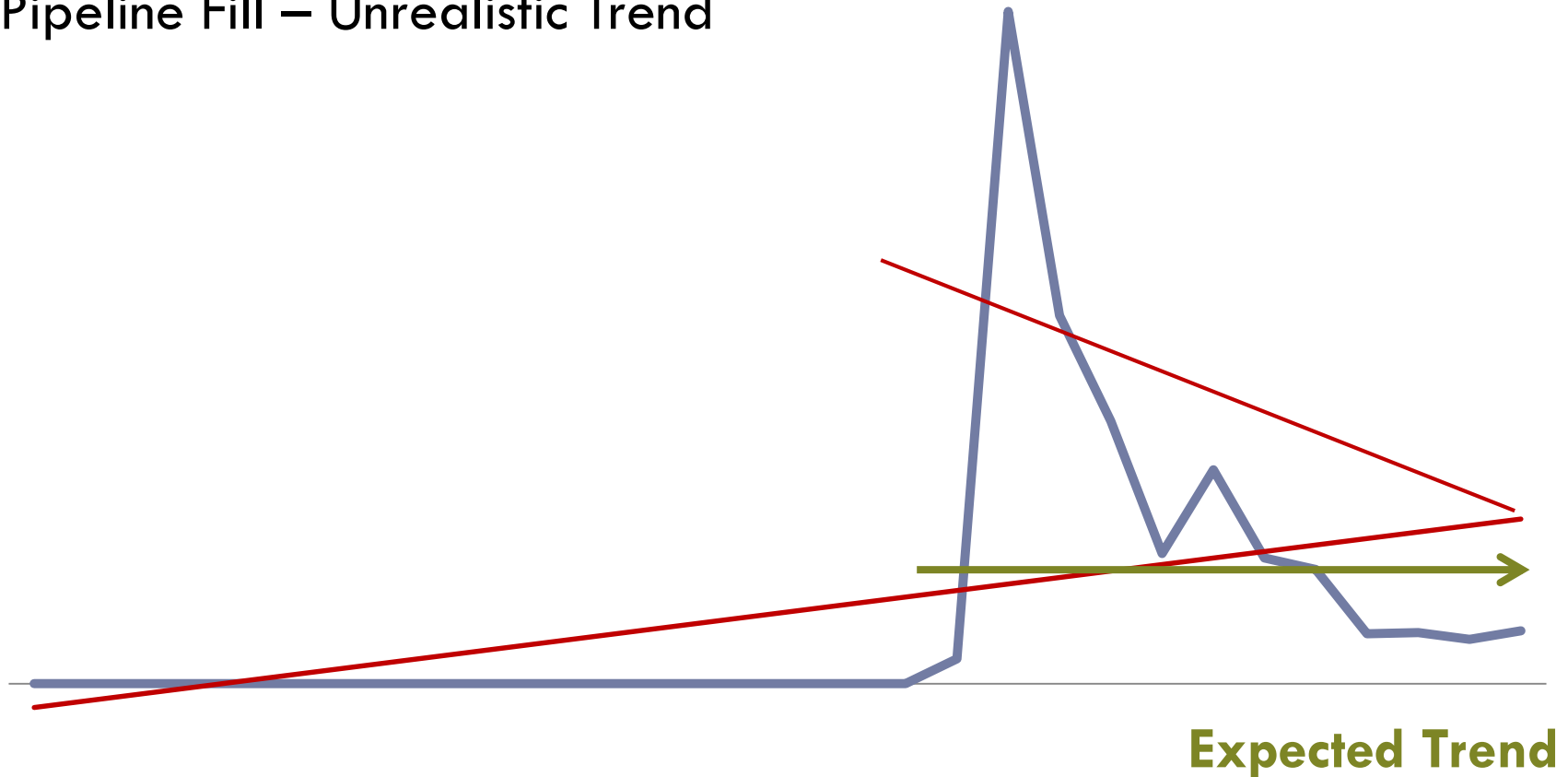
— Total — All 36 months — Last 24 months — Last 12 months



Trend @ 36, 24, & 12 periods

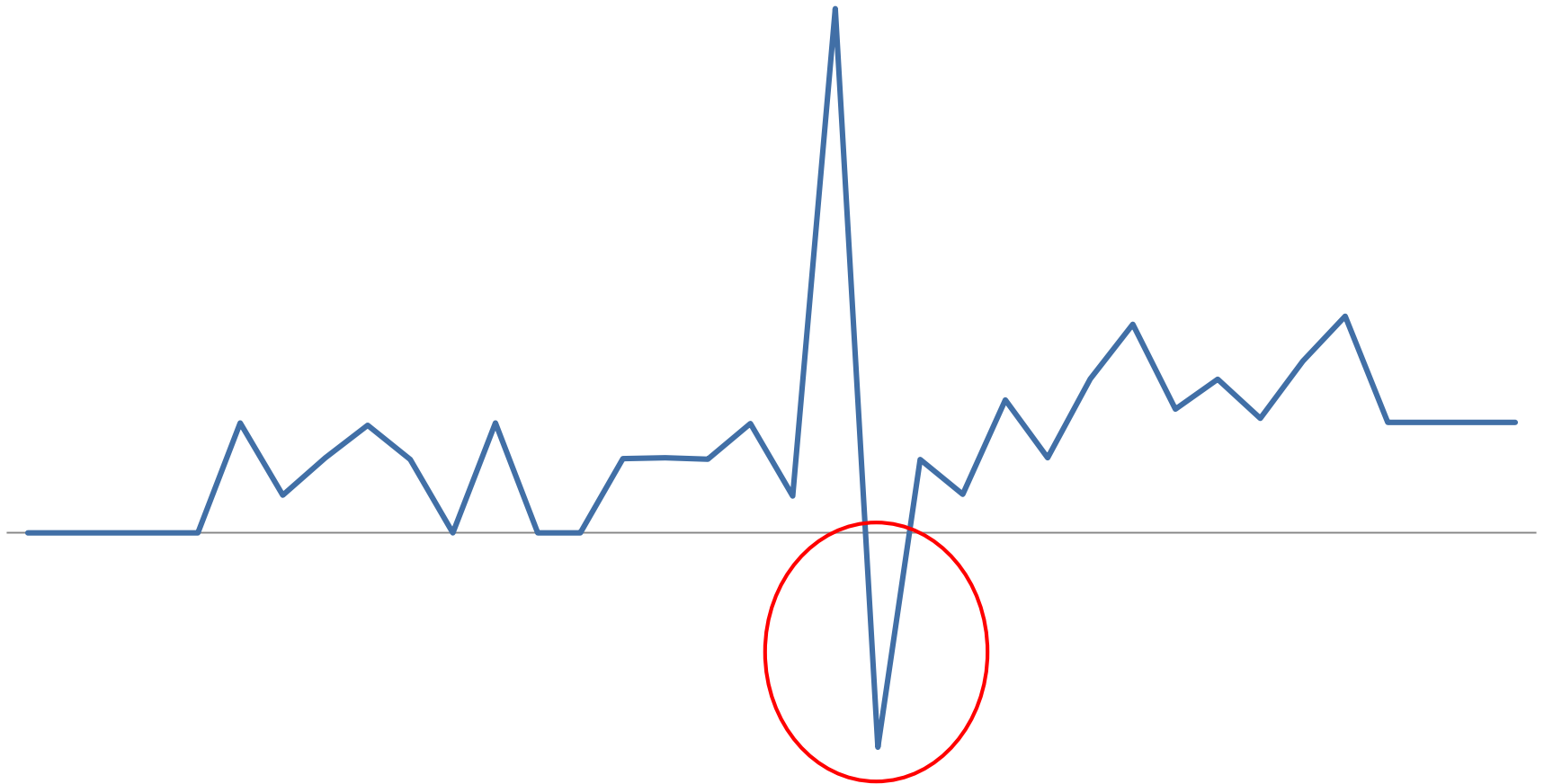
Recognizing Data Variables

Pipeline Fill – Unrealistic Trend



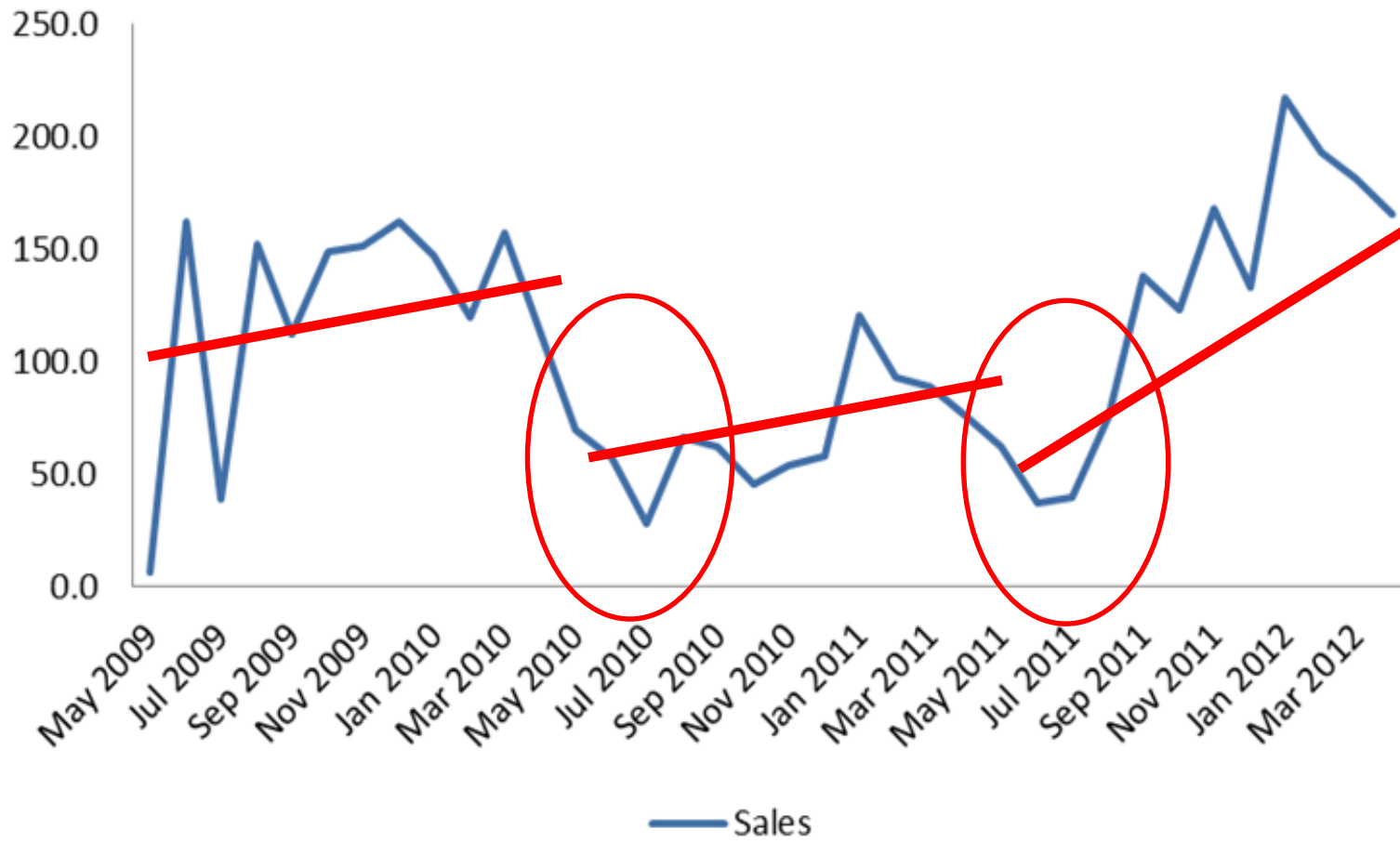
Recognizing Data Variables

Negative Sales



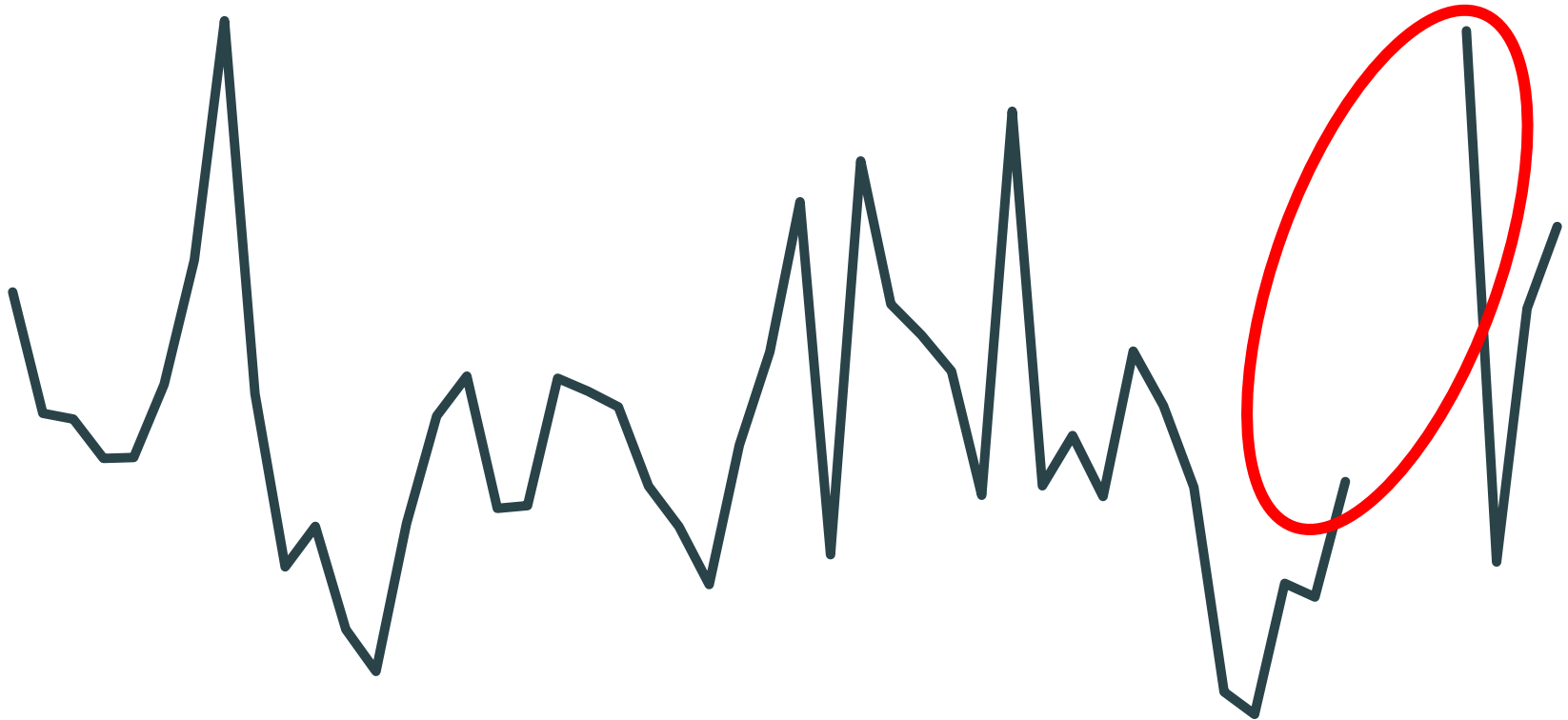
Recognizing Data Variables

Trend and intervention



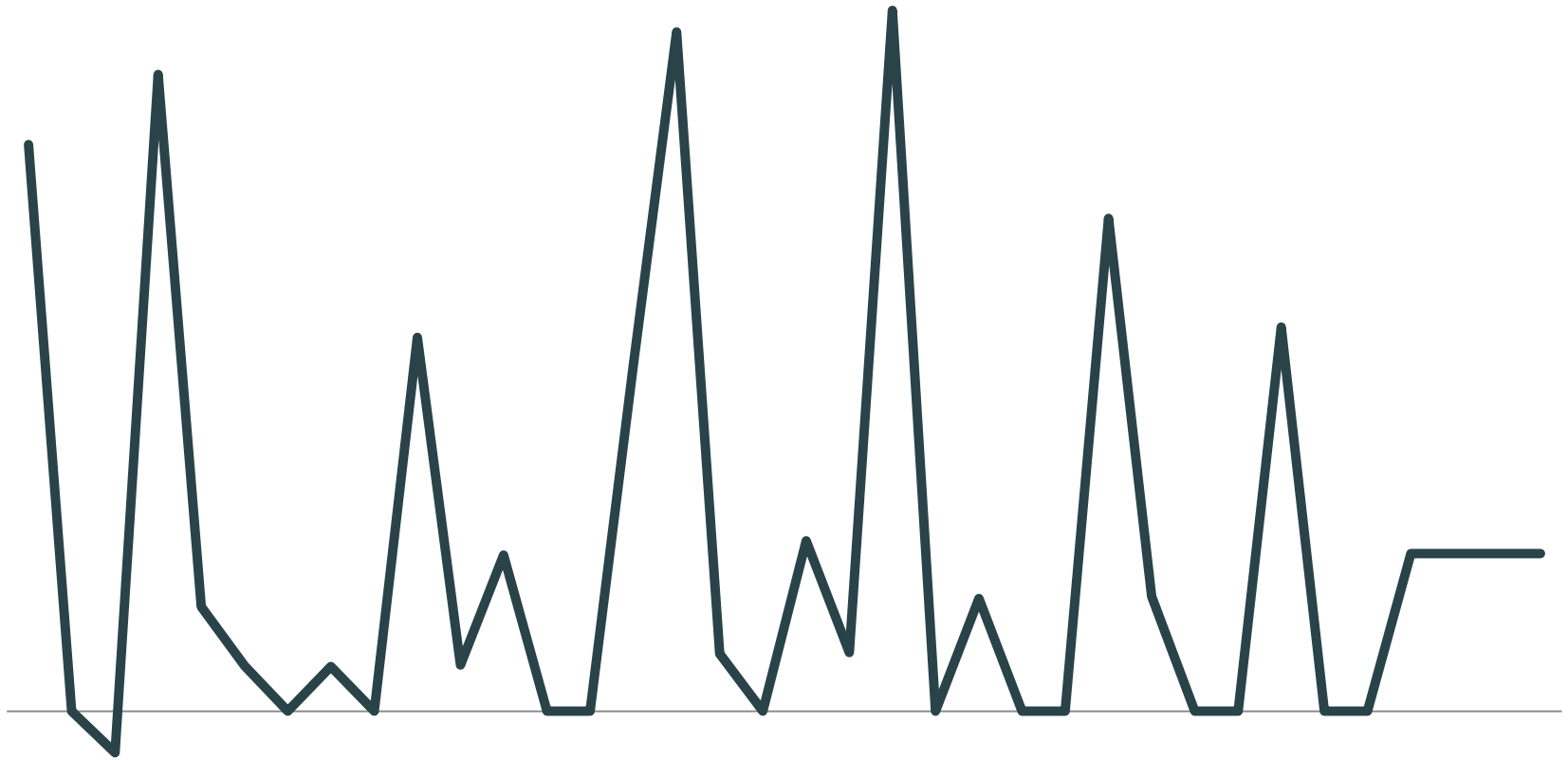
Recognizing Data Variables

Missing Data



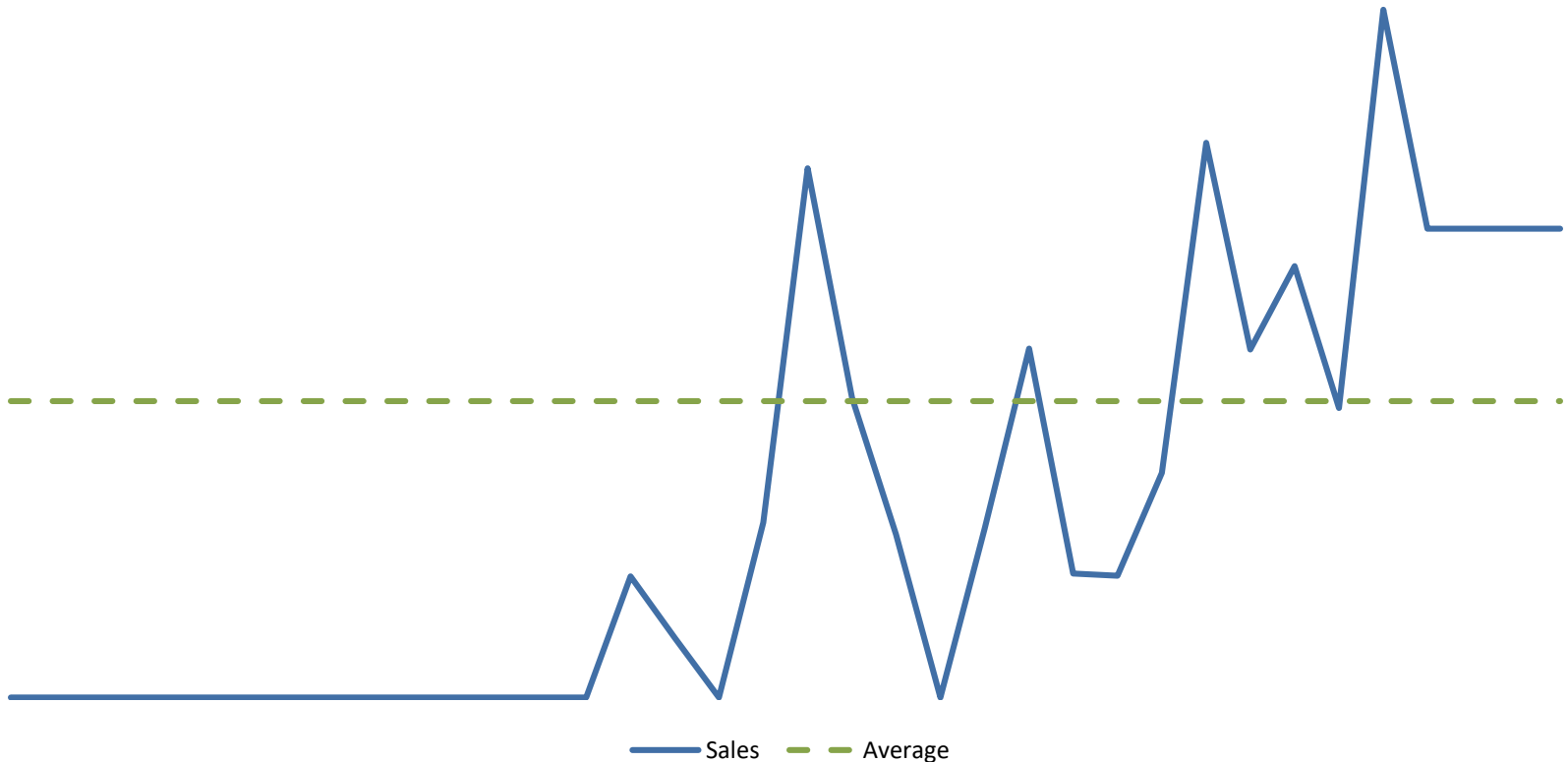
Recognizing Data Variables

Lumpy / Intermittent Demand



Recognizing Data Variables

High Variability / Short History



Data Patterns

Is this product stable or dynamic?

Year	2001	2002	2003	2003	2004	2004	2003
Type	Act\$		Act\$/Fcst\$	Consensus	Fcst\$	Consensus	Budget
Jan			17,283		1,231,152		1,757,142
Feb			750		950,984		1,623,203
Mar					1,439,245		1,225,868
Apr		872					
May	25	973,83					
Jun	43	1,893,099					
Jul	1,034,062	756,177					
Aug	1,056,382	697,1					
Sep	1,302,315	1,1					
Oct	1,020,06		99		958,369		1,372,795
Nov	1,017,76		6,717		958,370		1,077,998
Dec	1,554,61		1,528,386		1,669,997		1,956,904
Q1	3,464,966	2,103,638	2,067,084	2,067,084	3,621,381	3,621,381	4,606,313
Q2	3,502,428	3,739,094	2,113,589	2,113,589	2,788,785	2,788,785	3,621,381
Q3	3,392,759	2,576,370	2,829,575	2,829,575	3,332,705	3,332,705	3,621,381
Q4	3,592,43	59	3,575,002	3,575,002	3,586,736	3,586,736	3,621,381
TOTAL	13,952,5		10,585,250	10,585,250	13,329,607	13,329,607	17,899,919

Are there any changes in data that we need to build in the forecast?

Are there any issues we need to correct?

Is this product trended?

Is this product seasonal?

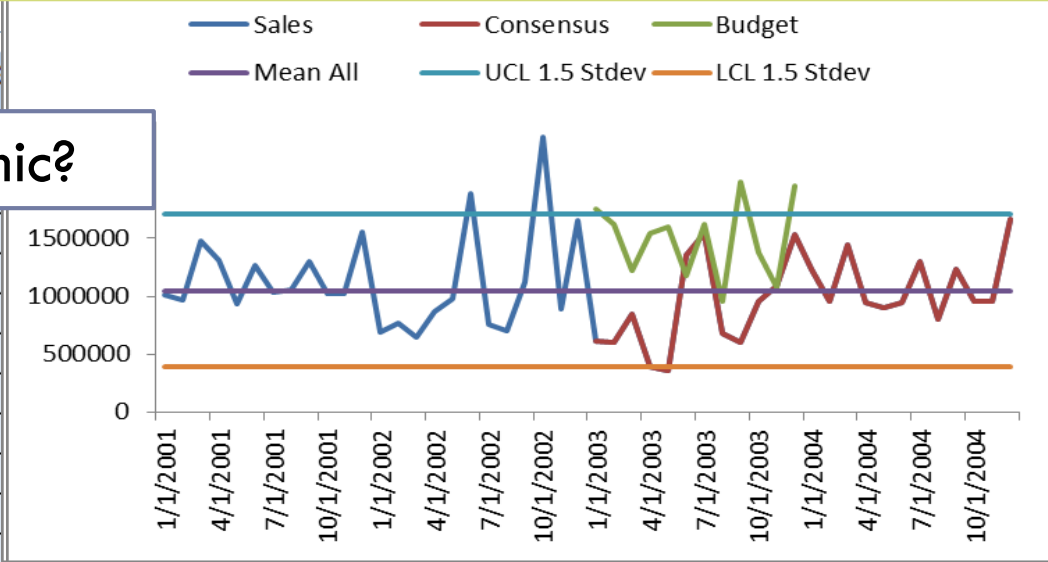


Are there any changes in data that we need to build in the forecast?

With help of SPC and visualization of the data, the questions can be answered with more accuracy than just a gut feel.

Is this product stable or dynamic?

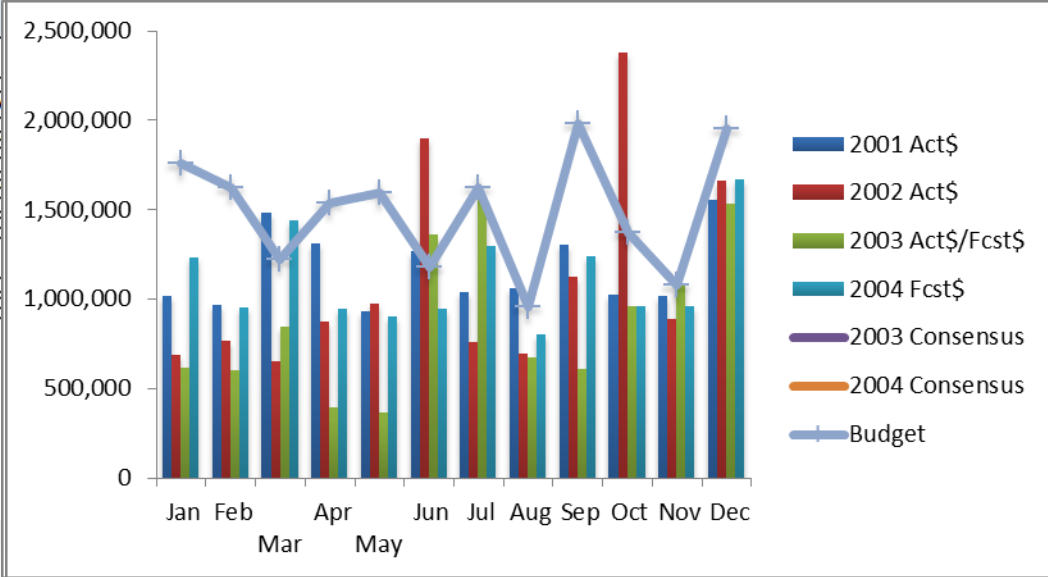
Mar	1,481,853	648,596	847,051
Apr	1,306,460	872,160	391,643
May	932,225	973,835	362,336
Jun	1,263,743	1,893,099	1,359,610
Jul	1,034,062	756,173	1,549,700
Aug	1,056,382	697,192	674,853
Sep	1,302,315	1,123,005	605,022
Oct	1,020,060	2,377,383	959,899
Nov	1,017,760	888,744	1,086,717
Dec	1,554,614	1,657,032	1,528,386



Are there any issues we need to correct?

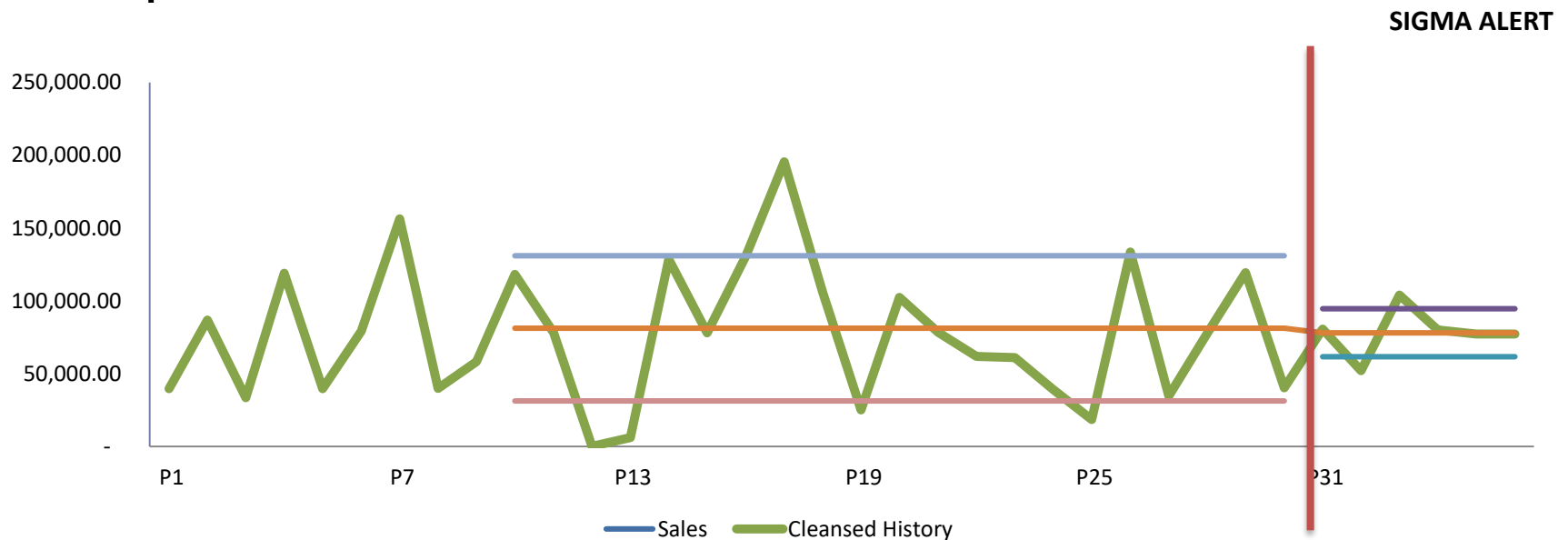
Is this product seasonal?

Is this product trended?



Recognizing Data Variables: Sigma Alert

- ▶ Standard deviation of last six months history is significantly higher/lower than previous 18 months.
- ▶ Indicates change in recent history that needs to be understood and either cleansed or incorporated in forecast adjustments or forecast model.



Data Pre-Processing / Cleansing

▶ Extreme Values

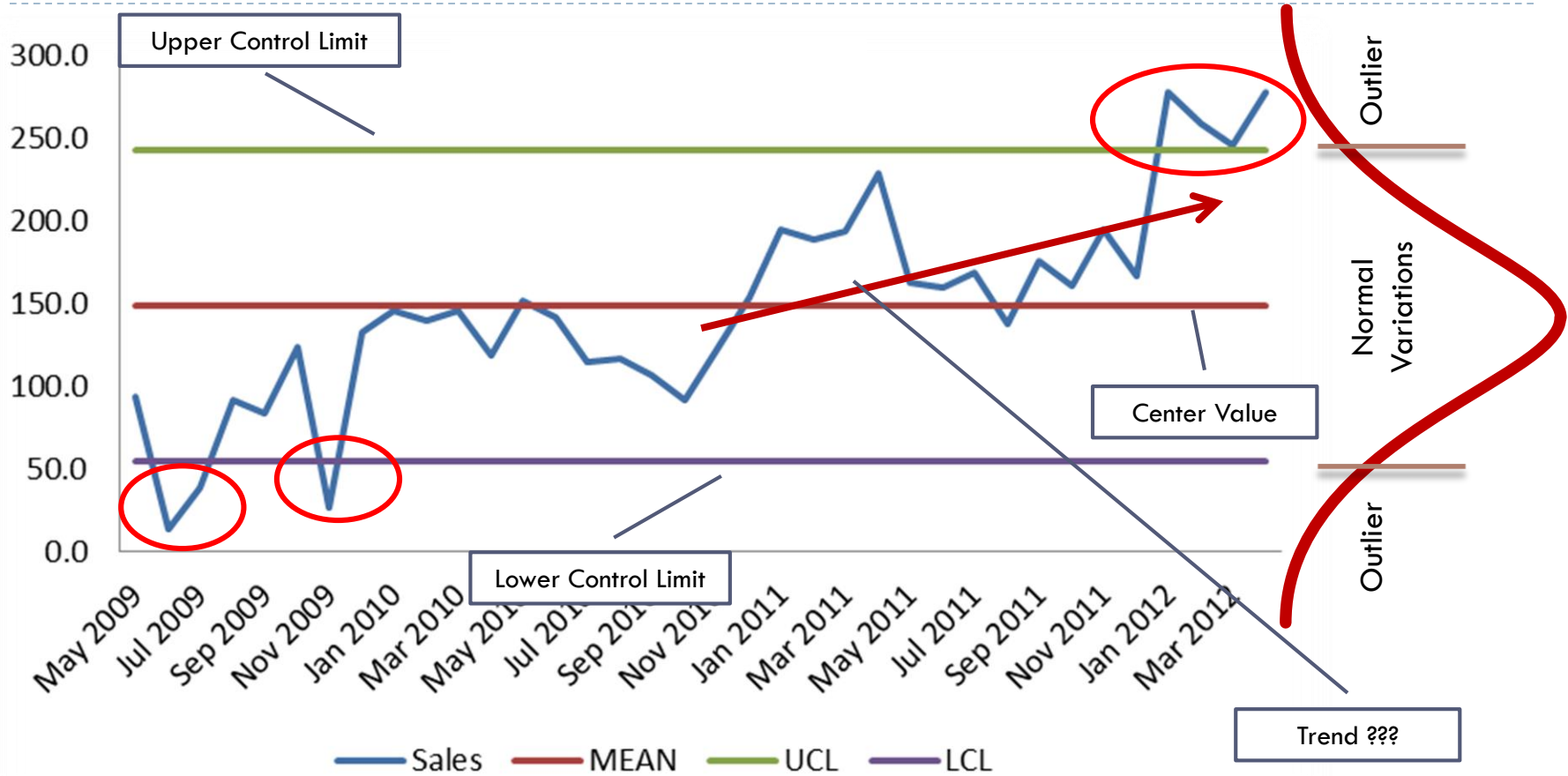
- ▶ Unusually large or small compared to other values in series (Outliers).
- ▶ Unusually different values within the series close to mean (Inliers).
- ▶ Automatic versus manual correction of Extreme Values
 - ▶ Most forecasting systems can do it. Not all can do it well. Use judgement and domain knowledge to remove or keep it.

▶ Choice of Time Span

- ▶ How many historical periods will be used for the forecast?
 - ▶ Simple Exponential Smoothing and Averages need 2-3 values
 - ▶ Double Exponential Smoothing needs 4 values
 - ▶ Triple Exponential Smoothing needs 24-36 monthly or 154 of weekly values



SPC Control Chart: Identifying Patterns



Center value and UCL/LCL definitions: There is a difference between Mean and Median, 1σ and 3σ , ... **Rule of thumb – start with Mean 18 Months and 1.5σ**

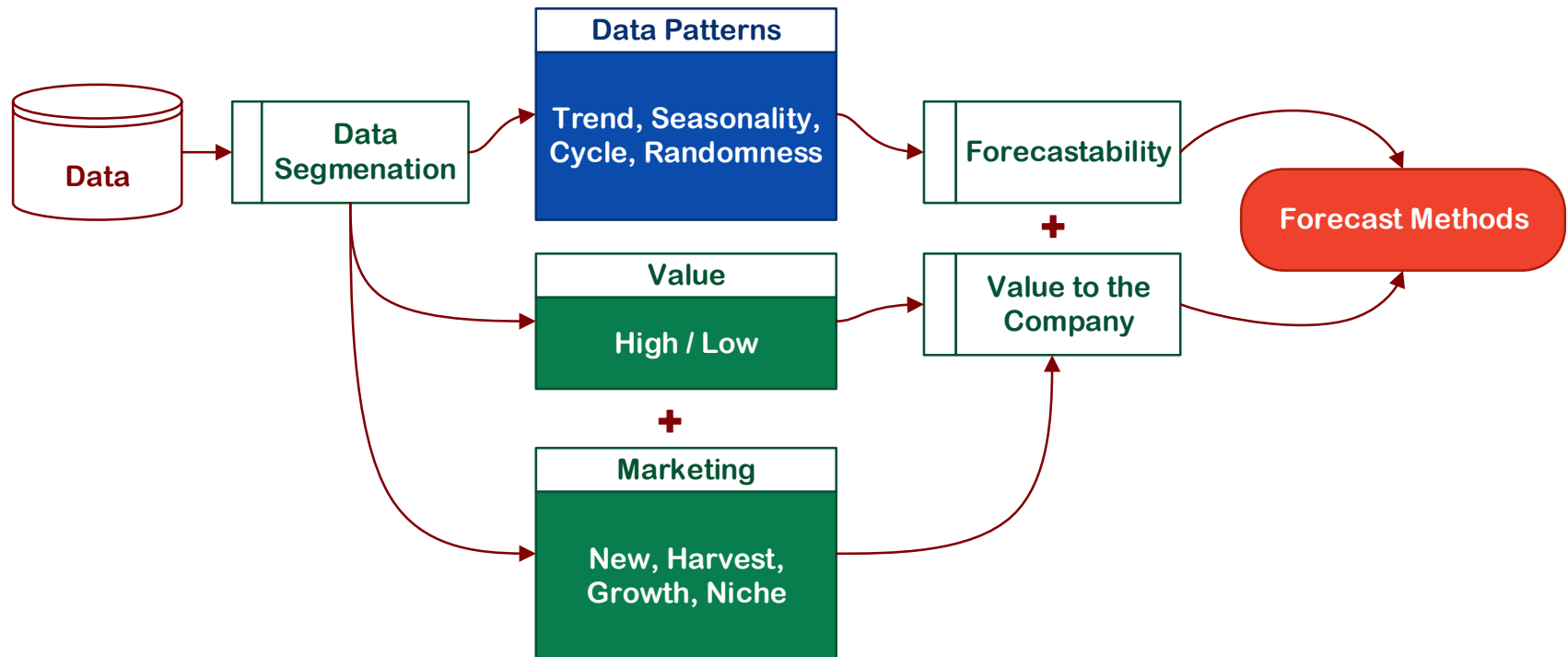


Data Segmentation



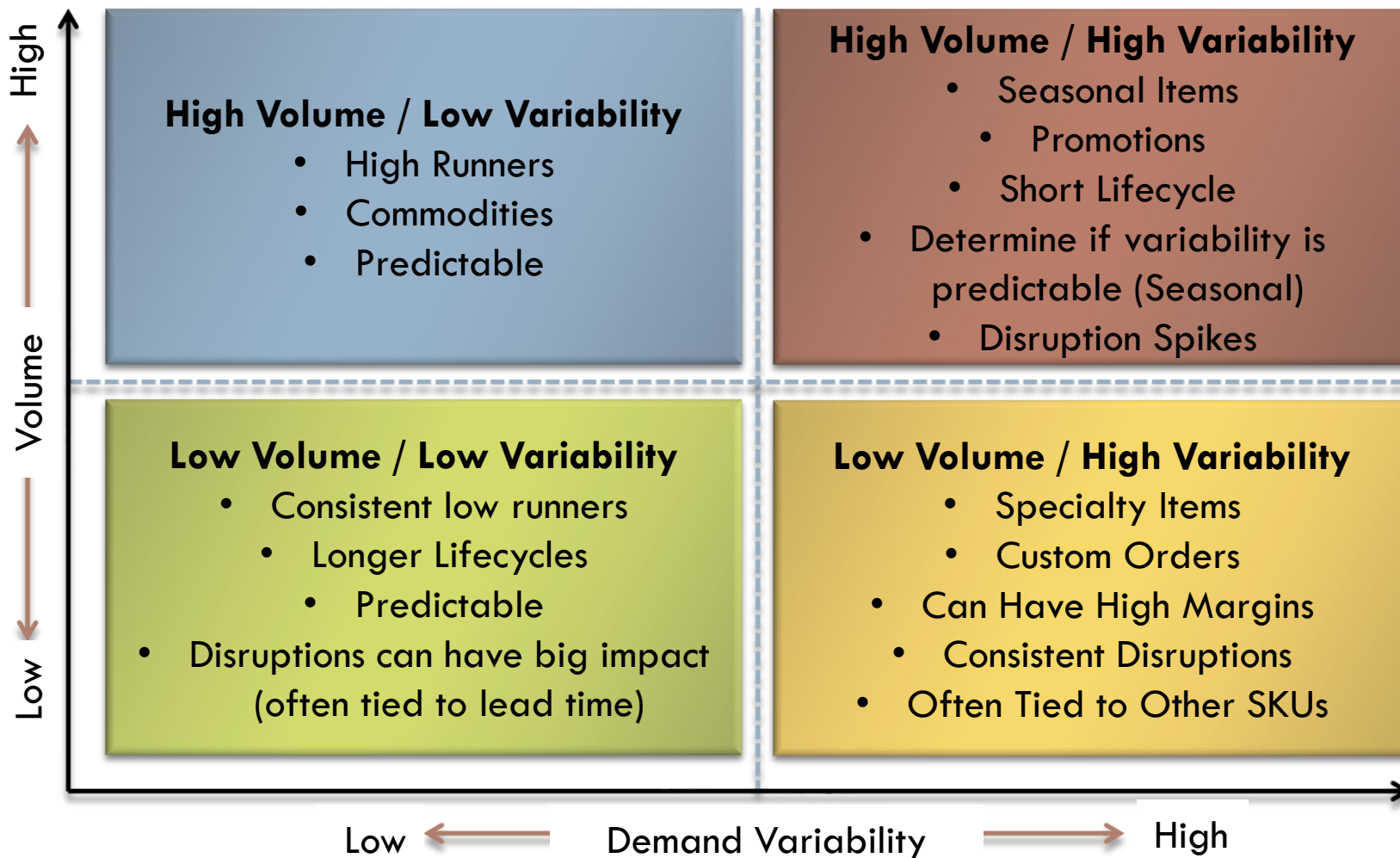
Segmenting Products to Choose Appropriate Forecasting Method

- ▶ Time series analysis \Rightarrow demand patterns \Rightarrow forecastability.
- ▶ Value to the company + forecastability \Rightarrow correct forecasting method.

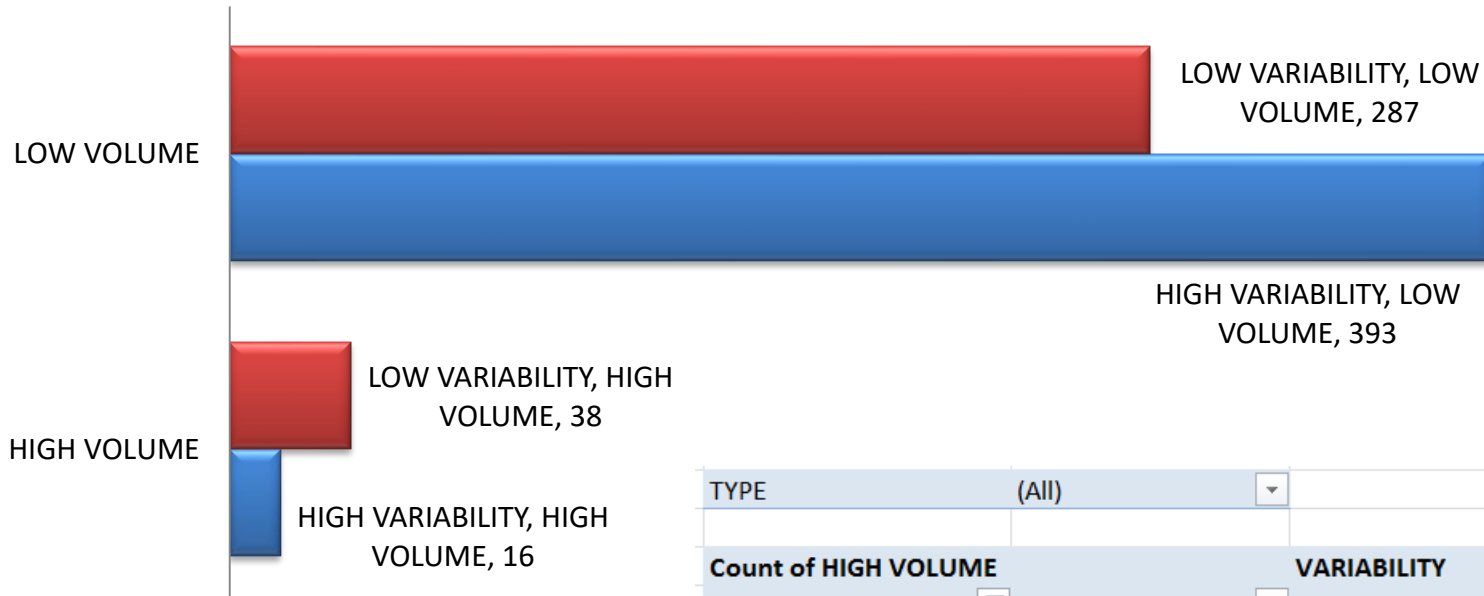


Source: Charles Chase, SAS

Data Segmentation - Forecastability



Data Segmentation - Forecastability



■ LOW VARIABILITY
 ■ HIGH VARIABILITY

TYPE		(All)
Count of HIGH VOLUME		VARIABILITY
HIGH VOLUME	PRODUCT	HIGH VARIABILITY LOW VARI
⊕ HIGH VOLUME		16
⊕ LOW VOLUME		393

TYPE		(All)
Count of HIGH VOLUME		VARIABILITY
HIGH VOLUME	PRODUCT	HIGH VARIABILITY LOW VARIABILITY
⊖ HIGH VOLUME	BNDR SUB1-5	1
	BNDR TTL BRAND	1
	BNL LARGE	1
	BNL OPEN STOCK	1
	BNL SMALL	1
	BNL TTL BRAND	1
	LMW BASE	1
	LMW BASE TTL	1
	LMW PROMO TTL	1
	LMW TTL BRAND	1
	LPP SUB1-3	1

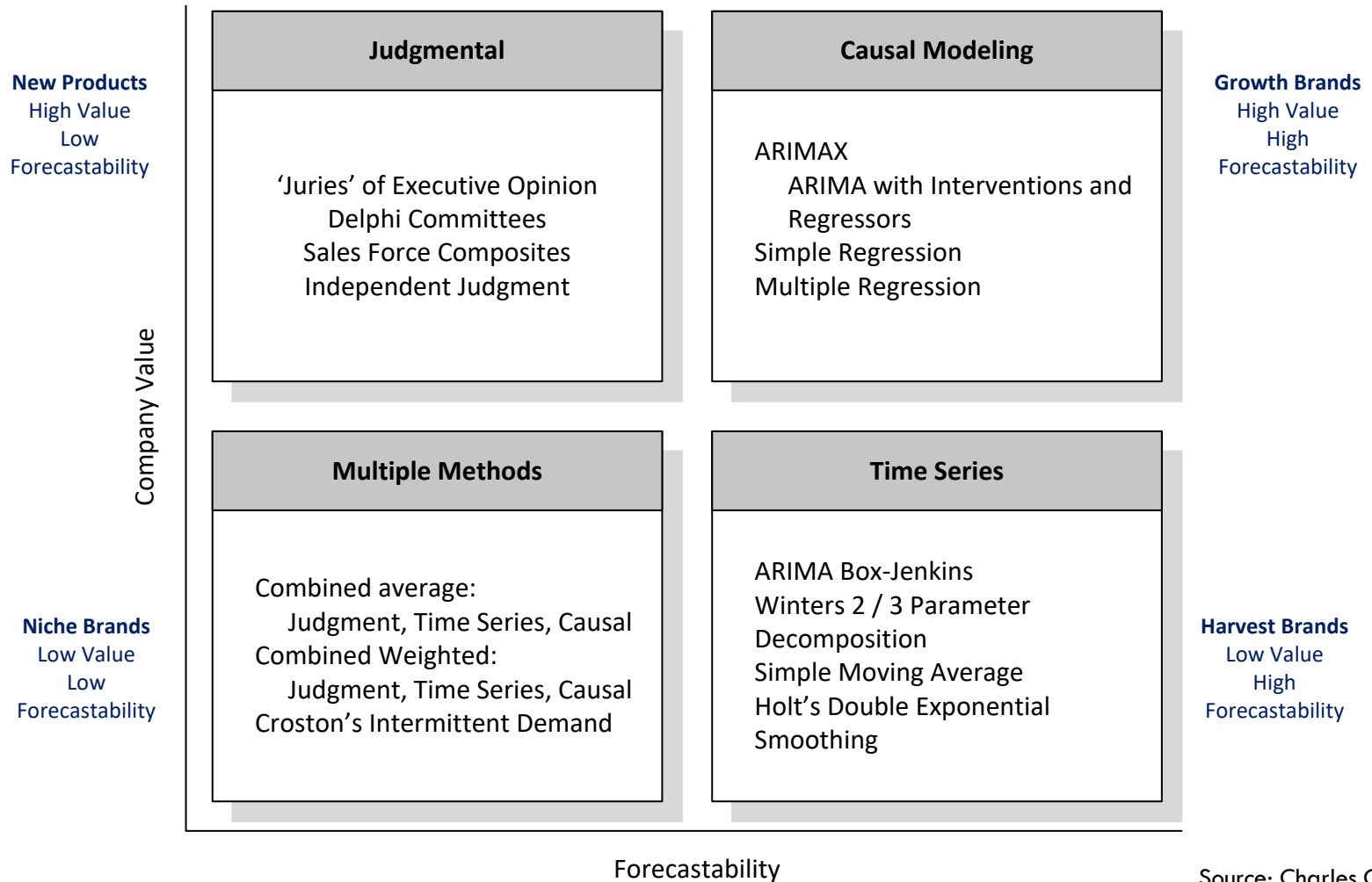


Four Quadrants Based on Portfolio Management



Source: Charles Chase, SAS

Statistical Methods Selection Based on Segmentation and Portfolio Management



Forecasting Outside-in

Linking Market Data to Shipments – Simplified Example



MTCA – Multi-Tiered Causal Analysis

“Integrating consumer demand into the demand forecasting process to improve shipment (supply) forecasts has become a high priority in the FMCG/CPG industry as well as in many other industries over the past several years.”

Charles Chase, SAS

- ▶ **Past constraints are becoming non-issue today:**
 - ▶ Data collection and storage
 - ▶ Computing power available
 - ▶ Data synchronization capabilities
 - ▶ Analytical expertise
- ▶ **MTCA, a process of nesting causal models together using data and analytics, considers marketing and replenishment strategies jointly, rather than creating two separate forecasts.**

Source: Charles Chase, SAS

Growth brand – traditional forecasting approach

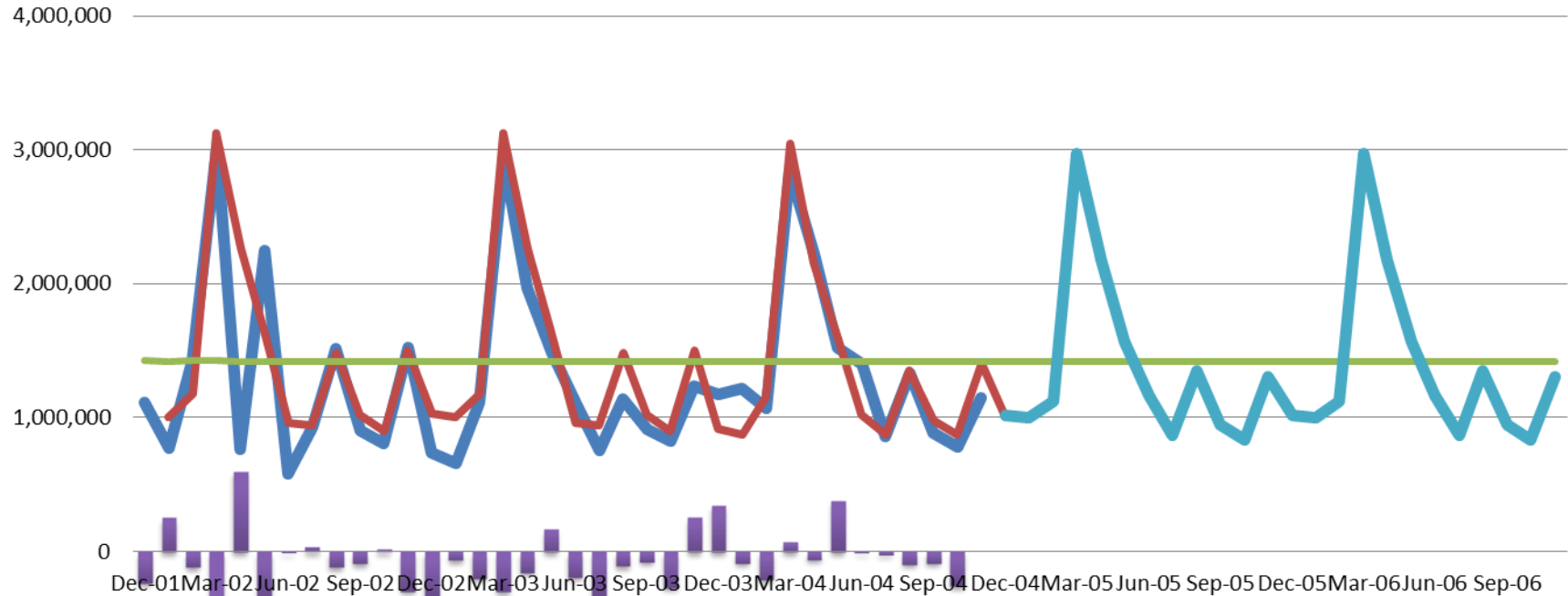


FAMILY: 8335

PRODUCT: (Multiple Items)

Model Selection:
SEASONAL NO TREND

Error ACTUAL FITTED FORECAST Smoothed+Trend Final Fcst



What do you think?

Pretty good forecast – isn't it?

Not so fast ...

ALPHA 0
BETA N/A
GAMMA 0.37



MTCA – Multi-Tiered Causal Analysis

Volume = Dollars

2003 LLE = \$19.9 MM

	2002 ACT	Dec-02 Act	Jan-03 Act	Feb-03 Act	QTR1 Est	Mar-03 Act	Apr-03 Act	May-03 Act	QTR2 ACT	Jun-03 Act	Jul-03 Est	Aug-03 Est	QTR3 Est	Sep-03 Est	Oct-03 Est	Nov-03 Est	QTR4 Est	2003 Est	
ACNielsen:																			
CATEGORY (\$)	30,077,767	2,033,611	2,136,003	2,148,627	6,318,241	2,166,687	2,201,271	2,484,930	6,852,888	2,697,575	3,048,107	5,532,617	11,278,299	2,247,604	2,003,662	1,929,266	6,180,552	30,629,980	
% CHG VYA	12%	7.6%	4.9%	0.7%	4.3%	5.8%	3.5%	3.7%	4.3%	1.6%	-1.0%	-1.5%	0.3%	-1%	0%	0%	0%	2%	
\$ Brand SHARE	60.8	62.3	61.1	59.9	61.1	60.7	60.2	60.0	60.3	59.4	57.9	58.0	58.3	60.1	60.9	61.1	60.7	59.8	
PT CHG VYA	-0.1	-0.4	-2.1	-3.4	-2.0	-0.6	-0.9	-0.5	-0.6	-0.3	-1.0	-1.9	-1.4	0.0	0.6	0.8	0.4	-1.0	
FDMX Consumption (\$)	18,283,099	1,266,722	1,304,258	1,288,037	3,859,017	1,314,287	1,325,036	1,491,525	4,130,848	1,603,660	1,766,196	3,208,256	6,578,112	1,351,078	1,219,678	1,178,162	3,748,918	18,316,895	
% CHG VYA	8%	6.9%	1.3%	-4.7%	3%	4.3%	2.0%	2.9%	3%	0%	-1%	-5%	-2%	-1%	1%	1%	0%	0%	
All Outlet Consumption (\$)	21,509,528	1,490,261	1,534,421	1,515,338	4,540,020	1,546,220	1,558,866	1,754,735	4,859,821	1,886,659	2,077,878	3,774,419	7,738,955	1,589,503	1,434,915	1,386,073	4,410,491	21,549,288	
Coverage Factor	85%																		
PIPELINE CHANGE	(760,658)	(499,361)	(640,721)	(10,462)	(1,150,544)	2,400,666	1,014,484	205,488	3,620,637	(397,433)	(1,088,665)	(2,246,236)	(3,732,335)	(363,293)	(326,213)	401,327	(288,175)	(1,150,420)	
PFE Shipments:																			
FVNS ** vs. YAG	15,600,654	734,000	662,000	1,114,723	2,510,723														
		-34%	-14%	-22%	-24%														
Brand Retail Markup (\$)	20,748,870	990,900	893,700	1,504,876	3,389,476														
Markup	35%																		
INVENTORY (\$)	3,348,403	2,849,042	2,208,321	2,197,859	2,197,859														
WEEKS SUPPLY	9.0	7.4	5.8	5.7															

	2002 ACT	Dec-02 Act	Jan-03 Act	Feb-03 Act	QTR 1 Est
ACNielsen:					
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% CHG VYA	8%	6.9%	1.3%	-4.7%	3%
All Outlet Consumption (\$)	21,509,528	1,490,261	1,534,421	1,515,338	4,540,020
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WEEKS SUPPLY	9.0	7.4	5.8	5.7	

	03 LLE	03 LE	vs. LE
P	14,813,976	15,309,674	(495,698)
F	4,650,000	4,950,000	(300,000)
F	410,000	550,000	(140,000)
Total:	19,873,976	20,809,674	(935,698)

*August consumption data is based on 2.4-weekly periods (8 weeks in total) while all other months are based on 1.4-weekly periods.
 All assumptions exclude EyeEar and Polysporin Pain and Itch Relief Lotion

Polysporin Brand Building Blocks

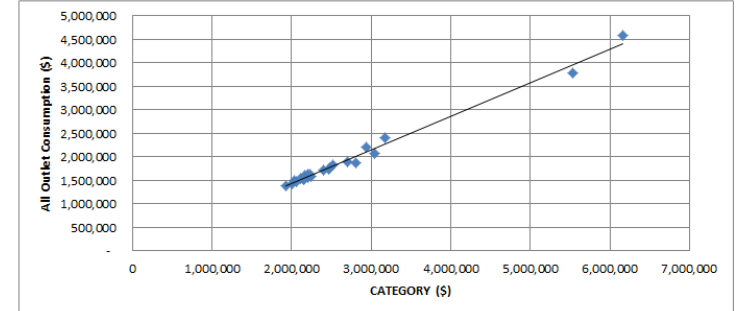
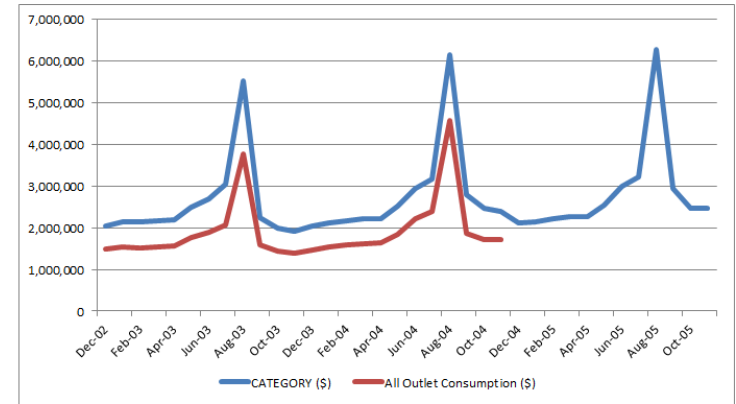
Market data from ACNielsen
 Factory shipments



1. Data Analysis

Date	Type	Fiscal Weeks	CATEGORY (\$)	Brand SHAR	FDMX Consumption (\$) (Scanned Data ACN)	All Outlet Consumption (\$)	Factory Shipment \$	TRADE INVENTORY (\$)	WEEKS SUPPLY
Dec-02	Act	4	2,033,611	62.3	1,266,722	1,490,261	734,463	2,849,042	7.4
Jan-03	Act	4	2,136,003	61.1	1,304,258	1,534,421	661,829	2,208,321	5.8
Feb-03	Act	4	2,148,627	59.9	1,288,037	1,515,338	1,114,722	2,197,859	5.7
Mar-03	Act	5	2,166,687	60.7	1,314,287	1,546,220	2,923,619	4,598,525	11.8
Apr-03	Act	4	2,201,271	60.2	1,325,036	1,558,866	1,964,437	5,613,009	12.8
May-03	Act	4	2,484,930	60.0	1,491,525	1,754,735	1,489,604	5,818,496	12.3
Jun-03	Act	5	2,697,575	59.4	1,603,660	1,886,659	1,123,536	5,421,063	10.4
Jul-03	Act	4	3,048,107	57.9	1,766,196	2,077,878	752,945	4,332,398	9.2
Aug-03	Act	4	5,532,617	58.0	3,208,256	3,774,419	1,134,889	2,086,161	5.2
Sep-03	Act	5	2,247,604	60.1	1,351,078	1,589,503	910,417	1,722,869	4.8
Oct-03	Act	4	2,003,662	60.9	1,219,678	1,434,915	821,308	1,396,656	4.0
Nov-03	Act	5	1,929,286	61.1	1,178,162	1,386,073	1,236,016	1,797,983	5.2
Dec-03	Act	4	2,054,095	60.8	1,255,612	1,477,191	1,171,454	1,960,824	5.1
Jan-04	Act	4	2,113,144	61.6	1,310,651	1,541,942	1,217,944	1,996,659	5.0
Feb-04	Act	4	2,167,572	62.6	1,357,807	1,597,420	1,066,943	2,471,326	6.1
Mar-04	Act	5	2,210,138	62.1	1,372,888	1,615,162	2,838,462	3,198,523	7.8
Apr-04	Act	4	2,230,123	62.2	1,386,945	1,631,700	2,222,497	5,831,143	12.7
May-04	Act	4	2,525,107	61.8	1,560,678	1,836,092	1,526,343	6,350,913	11.5
Jun-04	Act	5	2,934,532	64.0	1,879,261	2,210,895	1,399,969	7,555,774	12.6
Jul-04	Act	4	3,169,163	64.2	2,035,892	2,395,167	858,509	6,284,247	11.0
Aug-04	Act	4	6,162,062	63.1	3,890,167	4,576,667	1,330,010	3,239,098	6.9
Sep-04	Act	5	2,806,567	56.5	1,586,197	1,866,114	883,780	3,527,584	8.2
Oct-04	Act	4	2,471,042	59.4	1,468,614	1,727,781	782,306	3,139,603	7.3
Nov-04	Act	5	2,400,000	60.7	1,456,000	1,712,941	1,148,239	4,086,662	9.5
Dec-04	Fcst	4	2,115,718						
Jan-05	Fcst	4	2,155,407						
Feb-05	Fcst	4	2,210,923						
Mar-05	Fcst	5	2,276,442						
Apr-05	Fcst	4	2,274,725						
May-05	Fcst	4	2,550,358						
Jun-05	Fcst	5	2,993,223						

Pipeline Fill	52,941	600,000	787,059
TV advertising for Polysporin	105,882	300,000	1,101,176



Comparison of category consumption and forecast with all outlet consumption for brand. Strong correlation between the two variables is confirming original assumptions of category influencing brand consumption.



2. Development of Consumption Forecast

Regression 1: Last 4 Periods Out of Sample				
b	0.670646293	114991.935	a	
SE X	0.01659508	43476.00362	SE Y	
R ²	0.989098563	57723.81787	SE	
F	1633.158501	18	df Residual	
SS Reg	5.44175E+12	59976704694	SS Residual	
t	40.41235579			

1

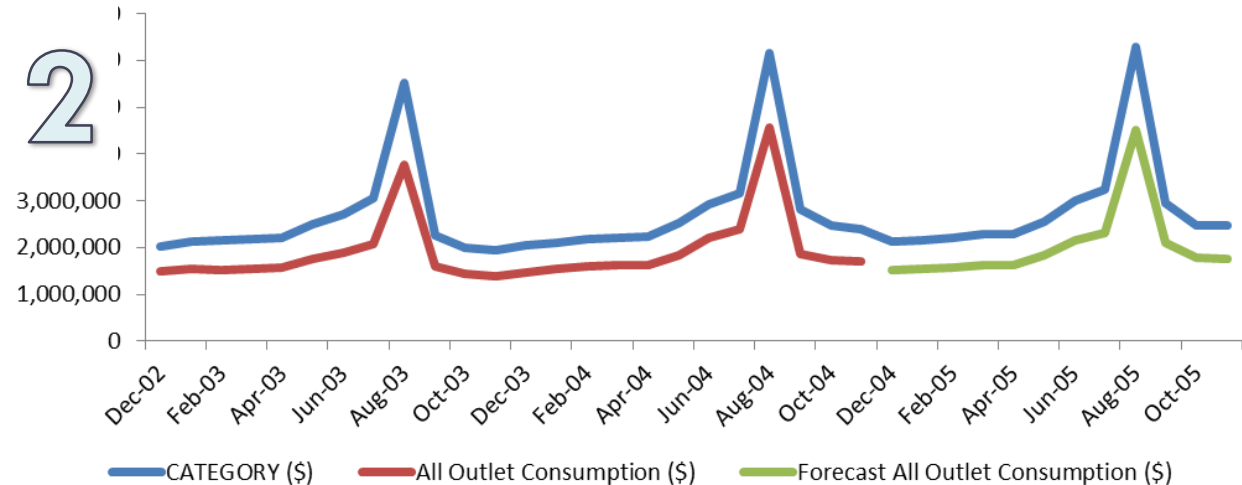
Running two regressions: first to validate the model, second to use the model to generate forecast for the brand's consumption.

Out of Sample				
Forecast	Bias	% Bias	Abs Error	APE
4,247,556	329,111	7%	329111.089	7%
1,997,206	(131,092)	-7%	131091.571	7%
1,772,187	(44,406)	-3%	44405.9146	3%
1,724,543	(11,602)	-1%	11601.8607	1%
	ME	-1%	MAPE	4%

Regression 2: All Data In Sample				
b	0.716448119	-987.7474012	a	
SE X	0.015630716	44552.36932	SE Y	
R ²	0.989636968	78137.09794	SE	
F	2100.930716	22	df Residual	
SS Reg	1.2827E+13	1.34319E+11	SS Residual	
t	45.83591076			

2

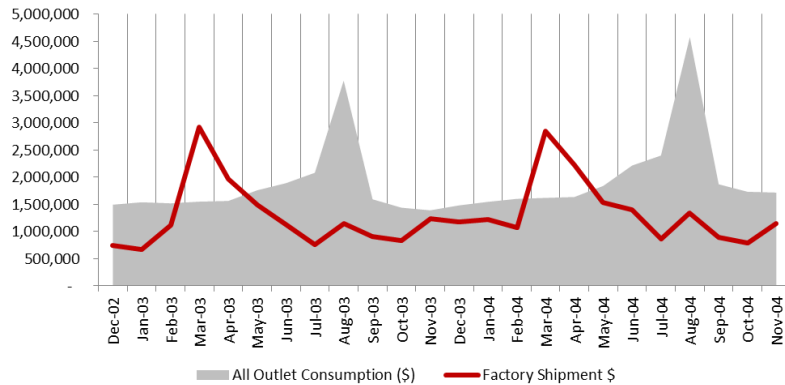
Consumption Forecast



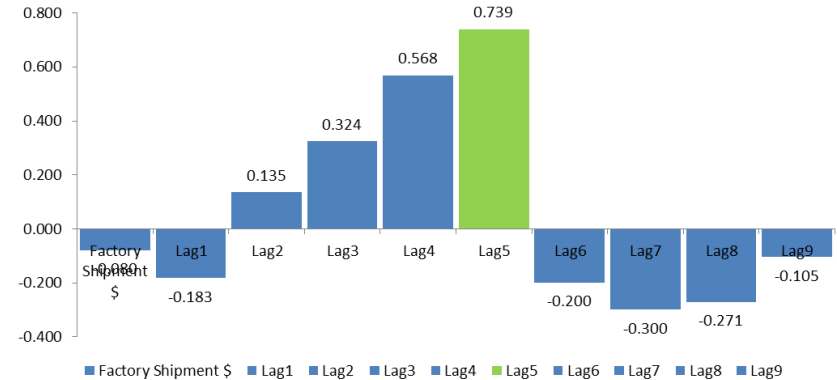
3. Development of Shipment Forecast Based on Consumption Forecast

Detection of lag/lead relationship of factory shipments and consumption.

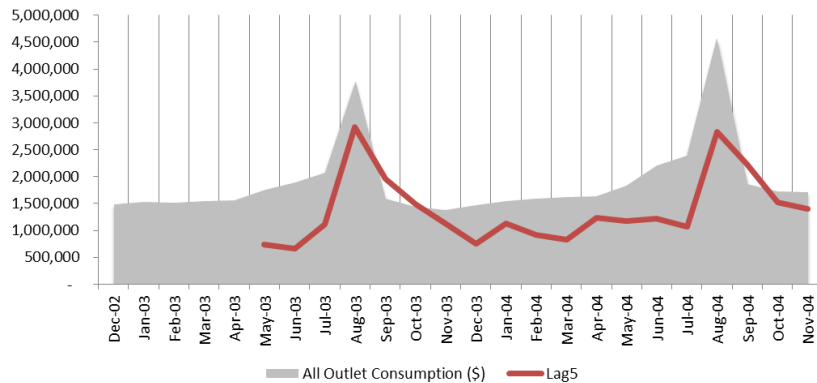
Consumption vs. Shipments



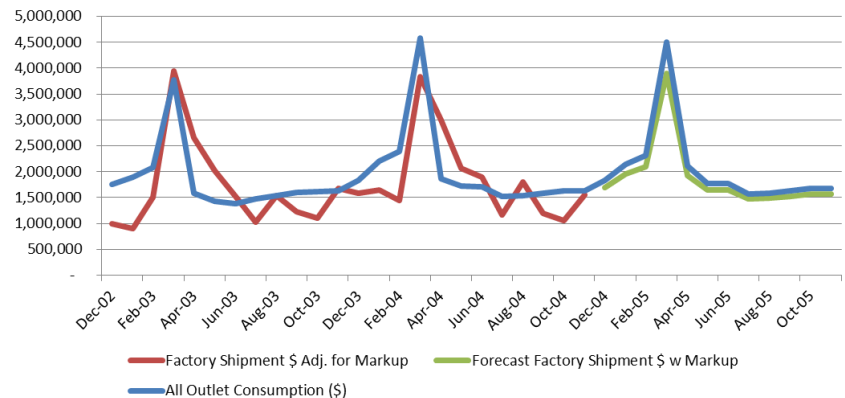
Correlation of Consumption with Lagged Shipments



Consumption vs. Lag 5 Shipments



Shipment Forecast based on Consumption Forecast (incl. Markup)



Shipment forecast based on consumption.



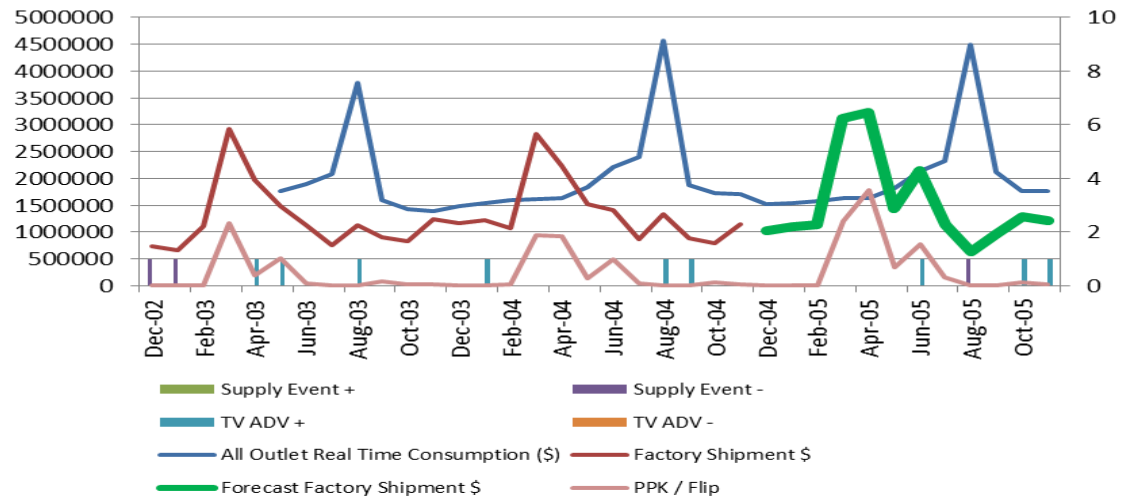
4. Linking Consumption Forecast to Supply Chain and Internal Marketing/Sales Programs

Factory Shipment \$	All Outlet Consumption (\$)	Supply Event +	Supply Event -	TV ADV +	TV ADV -	PPK / Flip
734,463	1,754,735	0	1	0	0	0
661,829	1,886,659	0	1	0	0	0
1,114,722	2,077,878	0	0	0	0	0
2,923,619	3,774,419	0	0	0	0	1,168,757
1,964,437	1,589,503	0	0	1	0	189,091
1,489,604	1,434,915	0	0	1	0	518,577

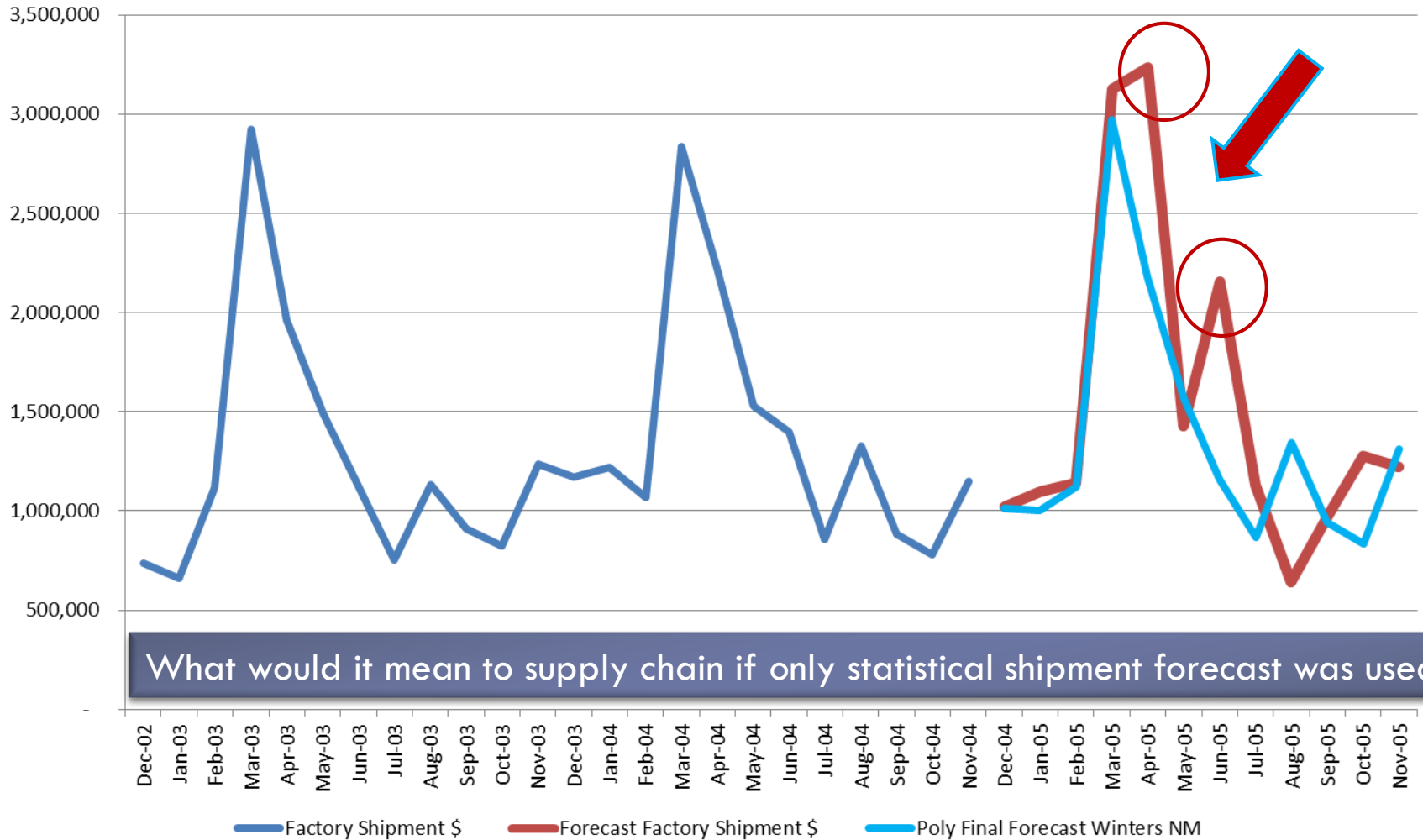
Adding supply events and TV advertising (dummy variables) plus marketing promotions (past history and forecast) as final variables to the consumption based factory shipment forecast.

Final forecast (green) based on consumption, supply chain constraints, marketing and sales activity.

Shipment Forecast based on Consumption Forecast and Supply / Marketing Events adjusted for Lag 5



Comparison of traditional forecasting approach (blue) versus MTCA (red).



Why Haven't Companies Embraced the Concept of Demand-Driven?



Incentives



Traditional view of supply chain excellence



Leadership



Focus: Inside out, not outside in



Vertical rewards versus horizontal processes



Focus on transactions not relationships

Why Haven't Companies Embraced the Concept of Demand-Driven?

- ▶ **Incentives:**
 - ▶ As long as sales is incented only for volume sold and marketing only for market share, companies will never become demand driven. To make the transition to demand-driven, companies must focus on profitable sales growth through the channel.
- ▶ **Traditional view of supply chain excellence.**
 - ▶ For demand-driven initiatives to succeed, they must extend from the customer's customer to supplier's supplier. Customer and supplier initiatives usually are managed in separate initiatives largely driven by cost.
- ▶ **Leadership.**
 - ▶ The concepts of demand latency, demand sensing, demand shaping, demand translation, and demand orchestration are not widely understood. As a result, they are not included in the definition of corporate strategy.
- ▶ **Focus: Inside out, not outside in.**
 - ▶ Process focus is (today) from the inside of the organization out, as opposed to from the outside (market driven) back. In demand-driven processes, the design of the processes if from the market back, based on sensing and shaping demand.
- ▶ **Vertical rewards versus horizontal processes.**
 - ▶ In supply-based organizations, the supply chain is incented based on cost reduction, procurement is incented based on the lowest purchased cost, distribution/logistics is rewarded fro on-time shipments with the lowest costs, sales is rewarded for sell-in volume into the channel, and marketing is rewarded for market share. These incentives cannot be aligned to maximize true value.
- ▶ **Focus on transactions not relationships.**
 - ▶ Today, the connecting processes of the enterprise – selling and purchasing – are focused on transactional efficiency. As a result, the greater value that can happen through relationships – acceleration of time to market through innovation, breakthrough thinking in sustainability, and sharing of demand data – never materializes.

Source: Charles Chase, SAS



Recommendations

▶ Understand Demand

- ▶ By better understanding demand, companies can plan production capacity and inventory level in a more accurate fashion, minimizing the risk of lost sales opportunities.

▶ Collaboration and Integration

- ▶ The ability to share information between departments within the business is essential to improving supply chain.
- ▶ Without internal communication processes in place (Demand Planning, S&OP), the company as a whole cannot effectively collaborate with the outside entities, whether they are supplier or customers.

▶ Supply Chain Management

- ▶ Increased visibility into supply decisions and constraints by providing input in the demand shaping and shifting activity will help ensure the product is available at the right place at the right time.



Thank
You 😊

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