Driving Value in a Value Chain

SECTION 1

Introduction

I Am A Social Scientist

I Write for the Supply Chain Leader

Who Is Lora?

Founder of Supply Chain Insights (13 years) "LinkedIn Influencer", Guest blogger for Forbes, Author: Bricks Matter (2012), Supply Chain Metrics That Matter (2014), and Shaman's Journal (2014-23)

2 years Partner at Altimeter Group (leader in open research)

8 years as an Analyst at Gartner and AMR Research

8 years Experience in Marketing and Selling Supply Chain Software at Descartes Systems Group and Manugistics (now Blue Yonder)

15 Years Leading Teams in Manufacturing and Distribution for Clorox, Kraft/General Foods, Nestle/Dreyers Grand Ice Cream and Procter & Gamble.

The Future
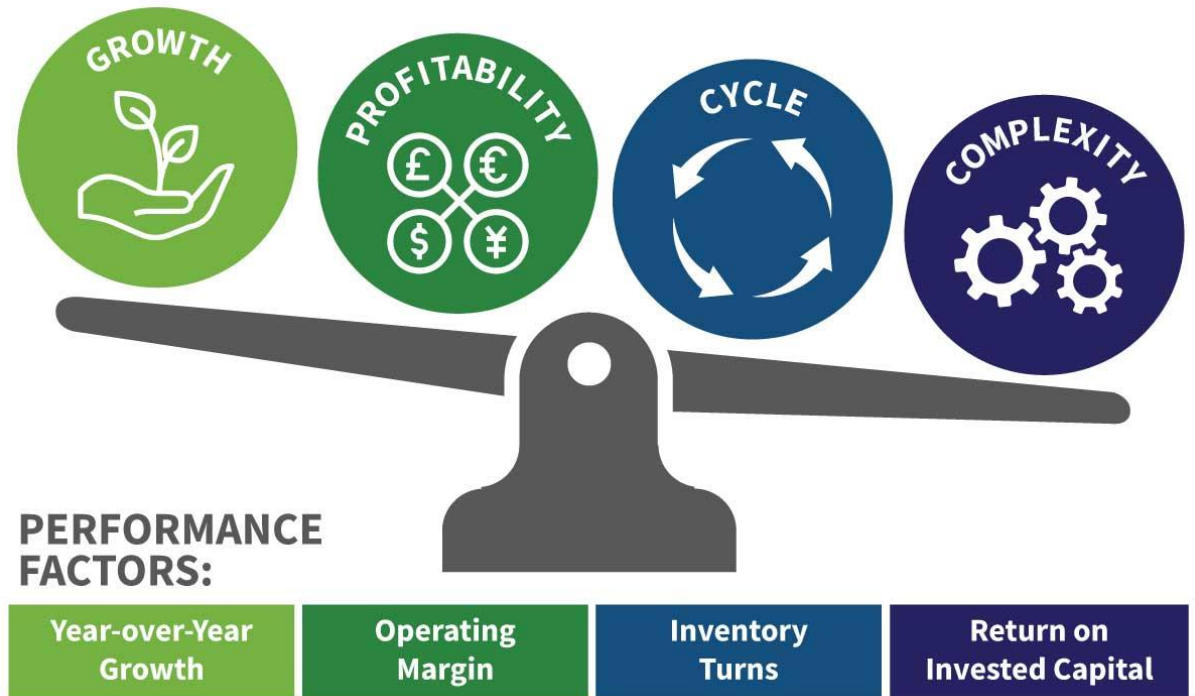Requires
Unlearning

SECTION 2

Supply Chain Excellence

What Is Supply Chain Excellence?

The alignment of source, make and deliver to deliver the operating strategy.

Growth Has the Highest Correlation to Value

GROWTH
PROFITABILITY
£ €
$ ¥
CYCLE
COMPLEXITY

PERFORMANCE FACTORS:

Year-over-Year Growth	Operating Margin	Inventory Turns	Return on Invested Capital

Balanced Scorecard

Selected representative factors from each of the 5 clusters

Chemical sector

- "profit_margin_annual",
- "total_operating_expense_annual",
- "finished_goods_annual",
- "normalized_basic_eps_annual",
- "retention_ratio_annual"

Food sector

- "cost_of_goods_sold_annual",
- "change_in_inventories_annual",
- "cash_annual",
- "revenue_per_employee_annual",
- "profit_margin_annual"

Pharmaceutical sector

- "cost_of_goods_sold_annual",
- "finished_goods_annual",
- "retention_ratio_annual",
- "operating_income_annual_per_share",
- "capex_to_revenue_annual"

Use these to increase market capitalization. Add customer service metrics as well.

Conflicting Objectives

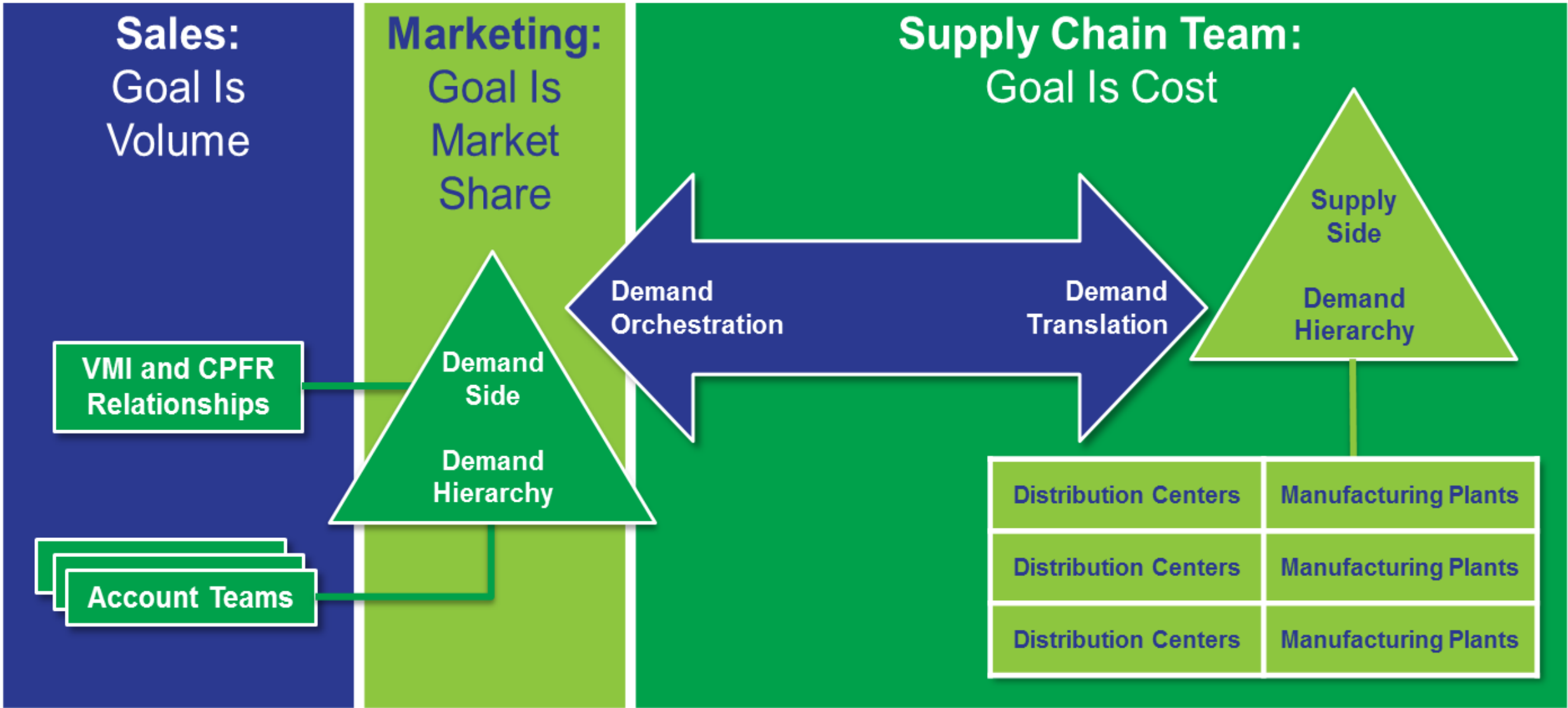| Sourcing	Manufacturing	Logistics	Sales / Customer Service

• Stable volume
• Large quantities
• Large lead time
	• Long runs
	• Stable volume
	• High buffer inventory (RM/FG)
		• Warehousing
		  • Less inventory
		  • Smooth flow
		  • Fewer SKUs
		• Transportation
		  • Full truck load
			• Availability
			• Flexibility
			• Responsiveness (order cycle time)

SECTION 3

Are We Aligned to Win?

Organizational Alignment
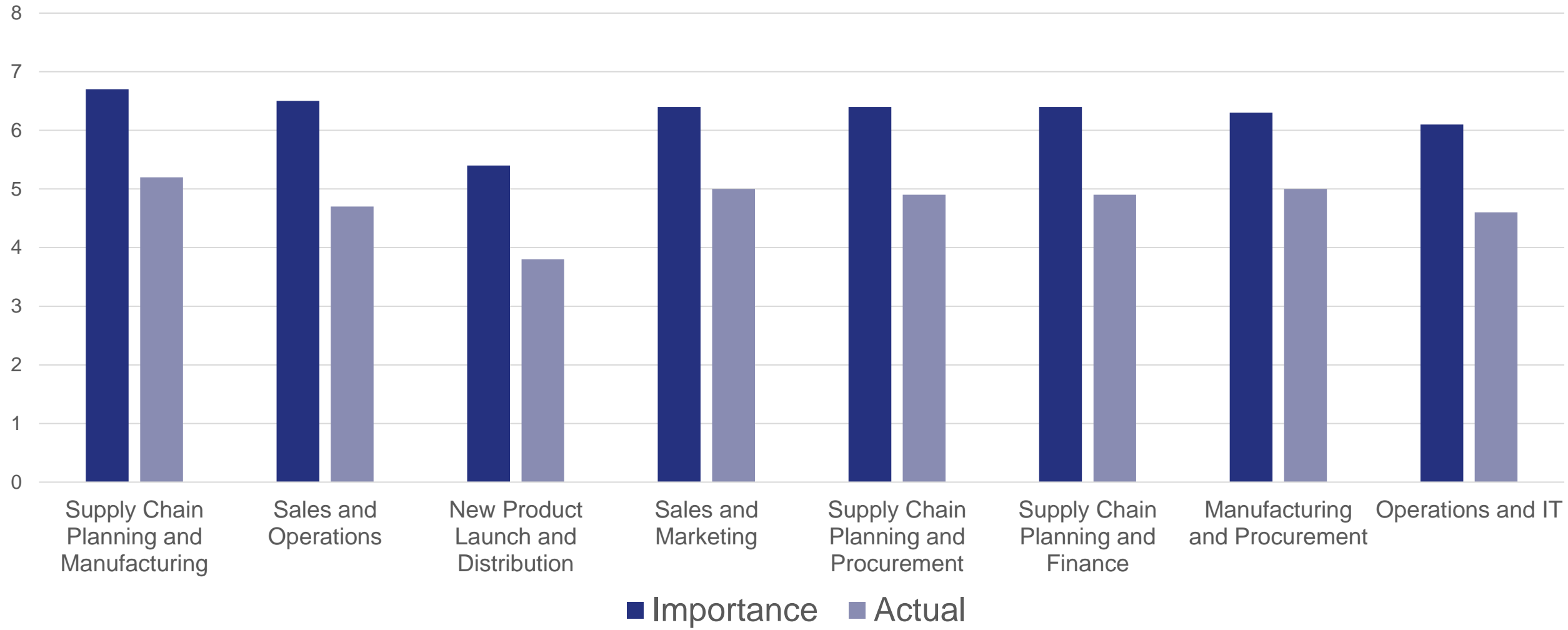
Q12: In your opinion, how important is it for each of the following pairs of teams to be aligned today?
Q13: How aligned do you believe that these same pairs of teams are at your company today?
Supply Chain Insights, 2024

Sales: Goal Is Volume

Marketing: Goal Is Market Share

Supply Chain Team: Goal Is Cost

VMI and CPFR Relationships

Account Teams

Demand Side

Demand Hierarchy

Demand Orchestration

Demand Translation

Supply Side

Demand Hierarchy

Distribution Centers | Manufacturing Plants
Distribution Centers | Manufacturing Plants
Distribution Centers | Manufacturing Plants

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SECTION 4

Decline in Performance

A Look at the Decade

Organizational

Alignment issues grew 3-fold for brand owners
Focus on efficient supply chains. Lack of recognition of supply chain flows.
Supply chain became a function within a functional organization focused on supply.
Investment in traditional applications. Little investment in network technologies.
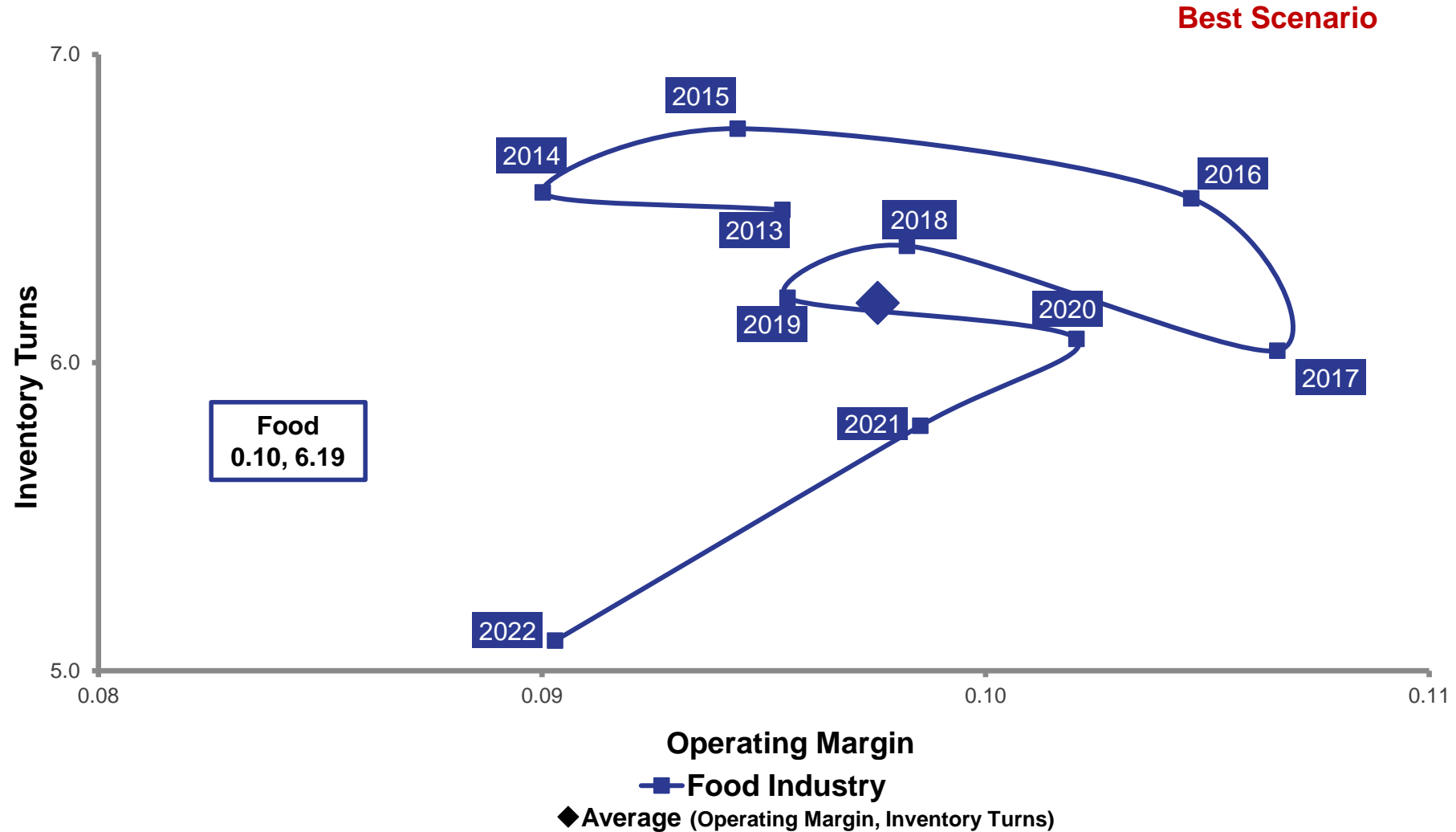
Value Chain

40-50% of products are no longer forecastable
8 out of 10 companies are degrading the forecast with current practices
Increase in demand latency
Growth of bullwhip impact
Increase in supply variability

Food Industry
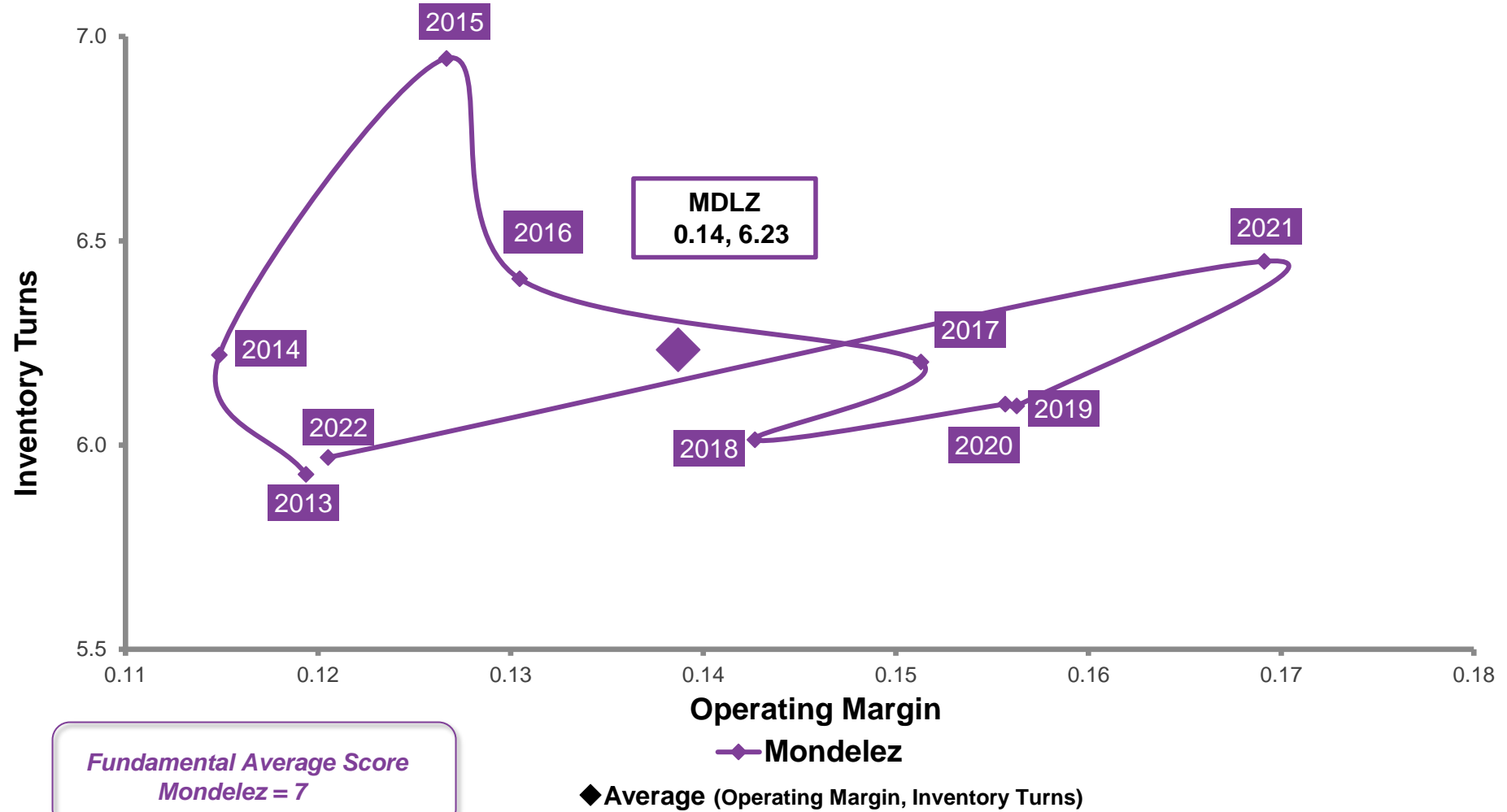## Operating Margin vs. Inventory Turns (2013 - 2022)

Best Scenario

Inventory Turns (y-axis): 5.0, 6.0, 7.0

Operating Margin (x-axis): 0.08, 0.09, 0.10, 0.11

Data points labeled: 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022

Food
0.10, 6.19

■ Food Industry
◆ Average (Operating Margin, Inventory Turns)

Mondelez
Operating Margin vs. Inventory Turns (2013 - 2022)

Best Scenario

MDLZ
0.14, 6.23

Inventory Turns

Operating Margin

◆—— **Mondelez**

◆ **Average** (Operating Margin, Inventory Turns)

Fundamental Average Score
Mondelez = 7

Source: Supply Chain Insights LLC, Corporate Annual Reports 2013-2022 from YCharts

The Industry Struggles with Inventory

Days of Inventory by Industry: Comparison across Years						
Industries	**Years**					**Difference (2020 - 2022 vs 2004 - 2006)**
	2004 - 2006	**2007 - 2008**	**2009 - 2013**	**2014 - 2019**	**2020 - 2022**	
Medical Device	110	113	131	143	163	53
Beverage	115	119	138	191	164	49
Pharmaceuticals	155	144	170	195	197	42
Beauty	89	108	116	125	124	35
Automotive Parts	49	55	64	69	81	32
Household Products	50	51	57	74	82	32
Aerospace & Defense	94	89	97	103	123	29
Chemical	62	58	64	80	88	26
Apparel Retail	62	65	66	69	84	22
Automotive	35	39	41	45	49	14
Food	50	51	56	58	59	9
Semiconductor	61	68	80	91	68	7
Broadline Retail	65	62	63	66	58	-7

Managing in a Value Network

	Growth	Operating Margin	Inventory Turns	ROIC
	Industry Sector Results 2013-2022			
Grocery	7%	0%	1%	-6%
Beverage	3%	-1%	-24%	-4%
Food	3%	-1%	-11%	-1%
Chemicals	15%	2%	-25%	0%
Packaging	7%	2%	-8%	1%

SECTION 5

Building Value Networks
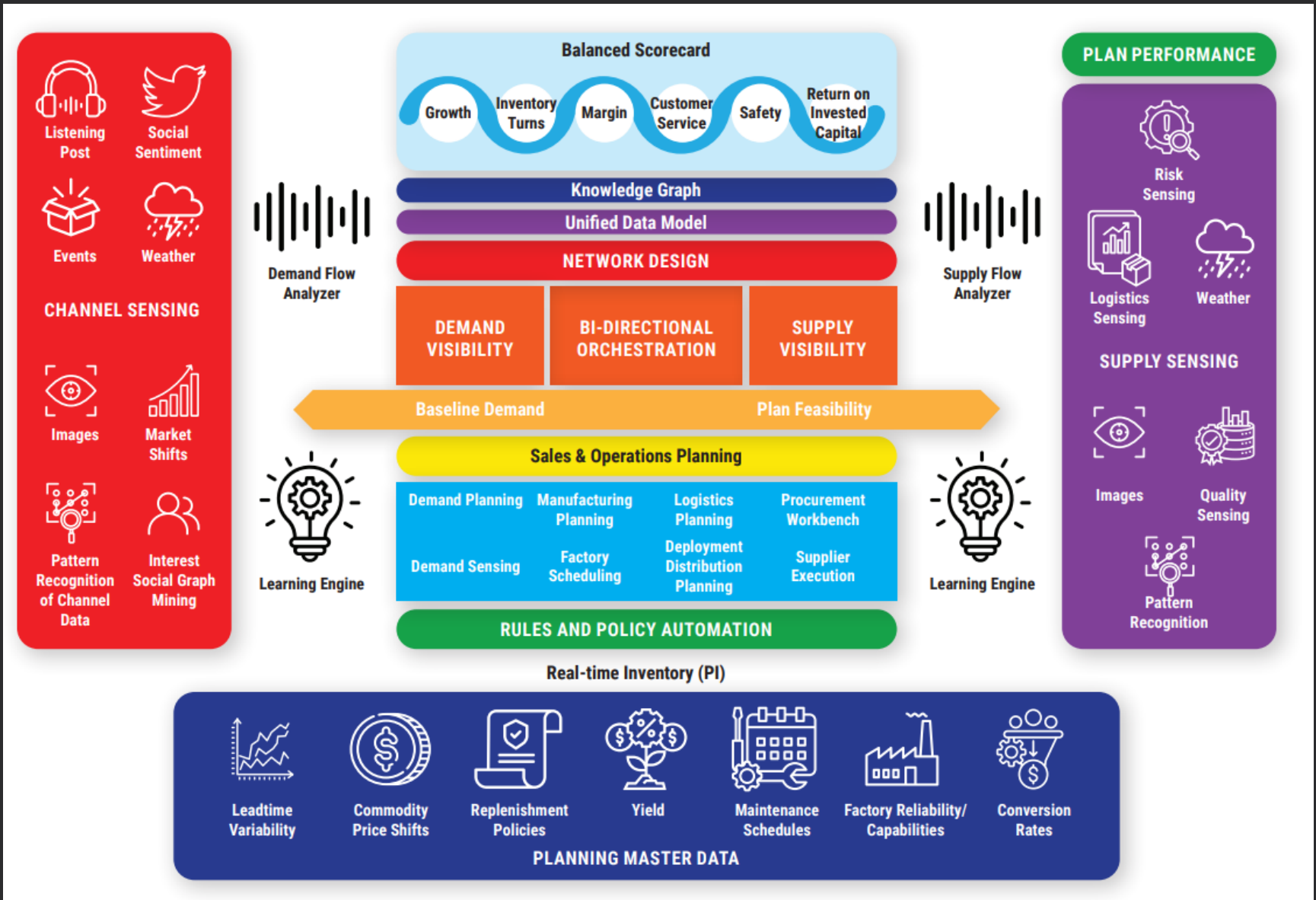
VISIBILITY – IMPORTANCE vs EFFECTIVENESS

Manufacturing Visibility 3.1 / 3.9 — 0.8

Supplier Visibility 2.5 / 4.0 — 1.5

Logistics Visibility 2.9 / 4.1 — 1.2

Enterprise Visibility 3.0 / 4.3 — 1.3

● Importance   ● Effectiveness   ● Gap
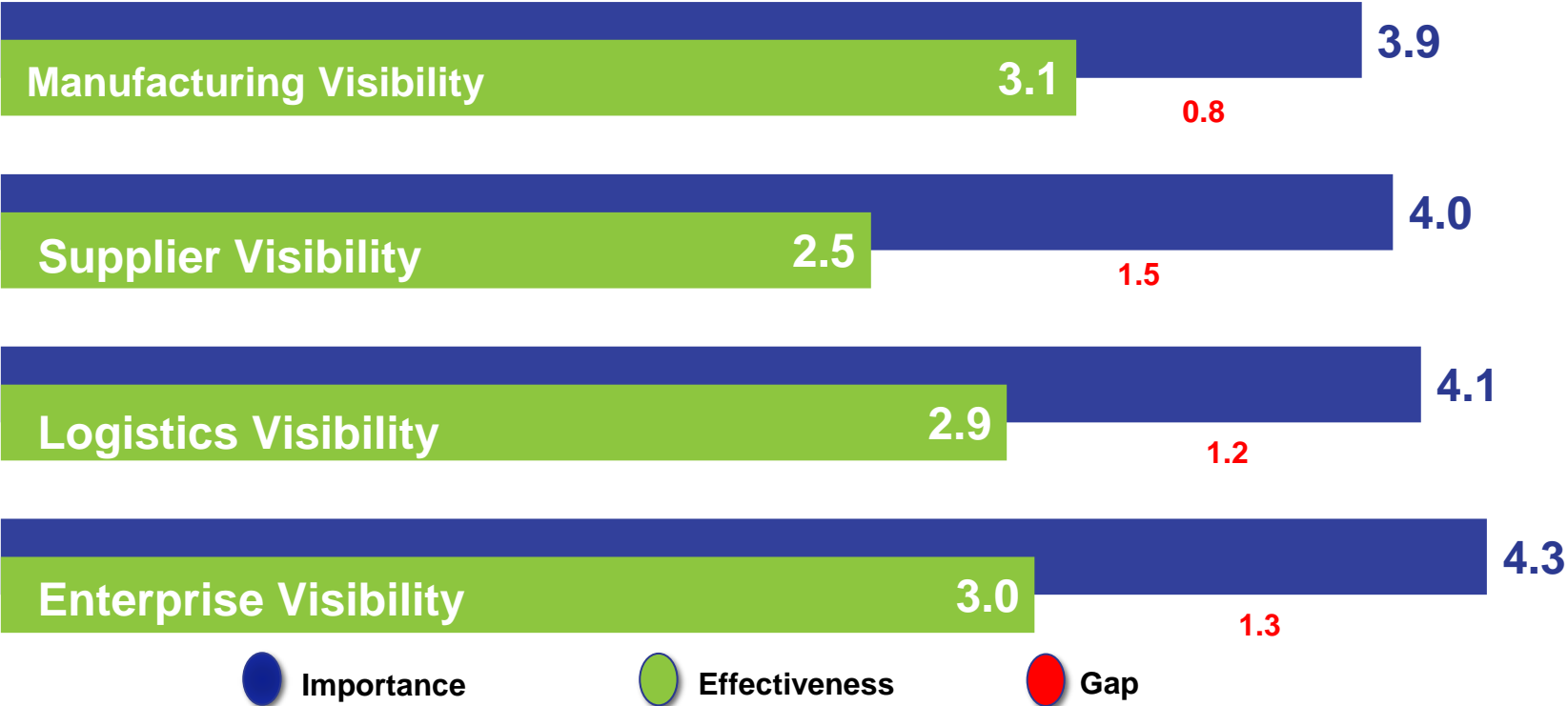
_____
Source: Supply Chain Insights LLC, Redefining The Supply Chain Response Study
Base: Total (n=64)
Q23: How **effective** would you rate your company on visibility?
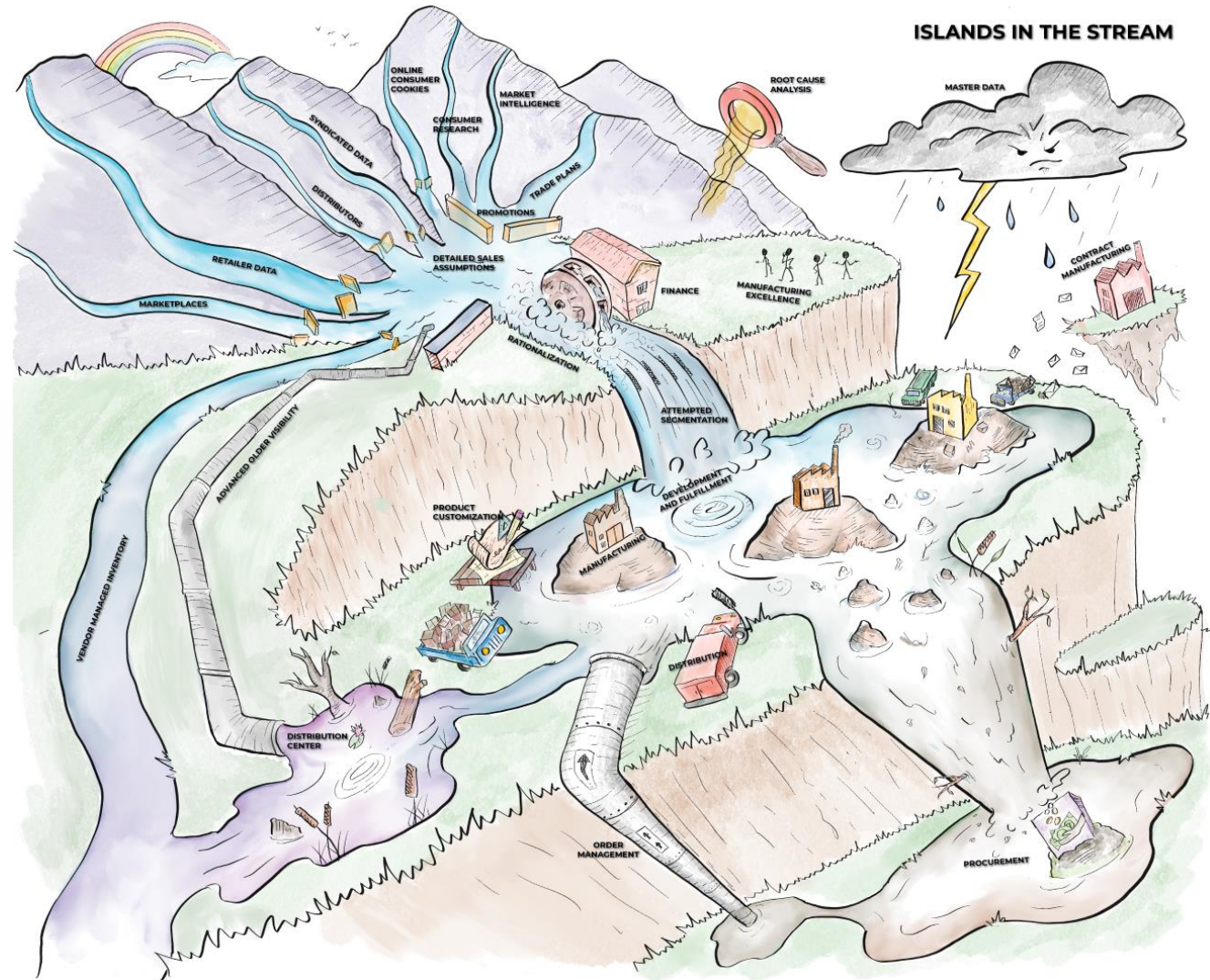Q24: How **important** would you rate visibility capabilities for your company?

Current Systems Amplify the Bullwhip

Translation of Volume Required at the Shelf

Customer · Retailer · Distributor · Manufacturer · Supplier

New Baseline Demand

Baseline Demand

Average Demand Latency= 20-to-30 Days
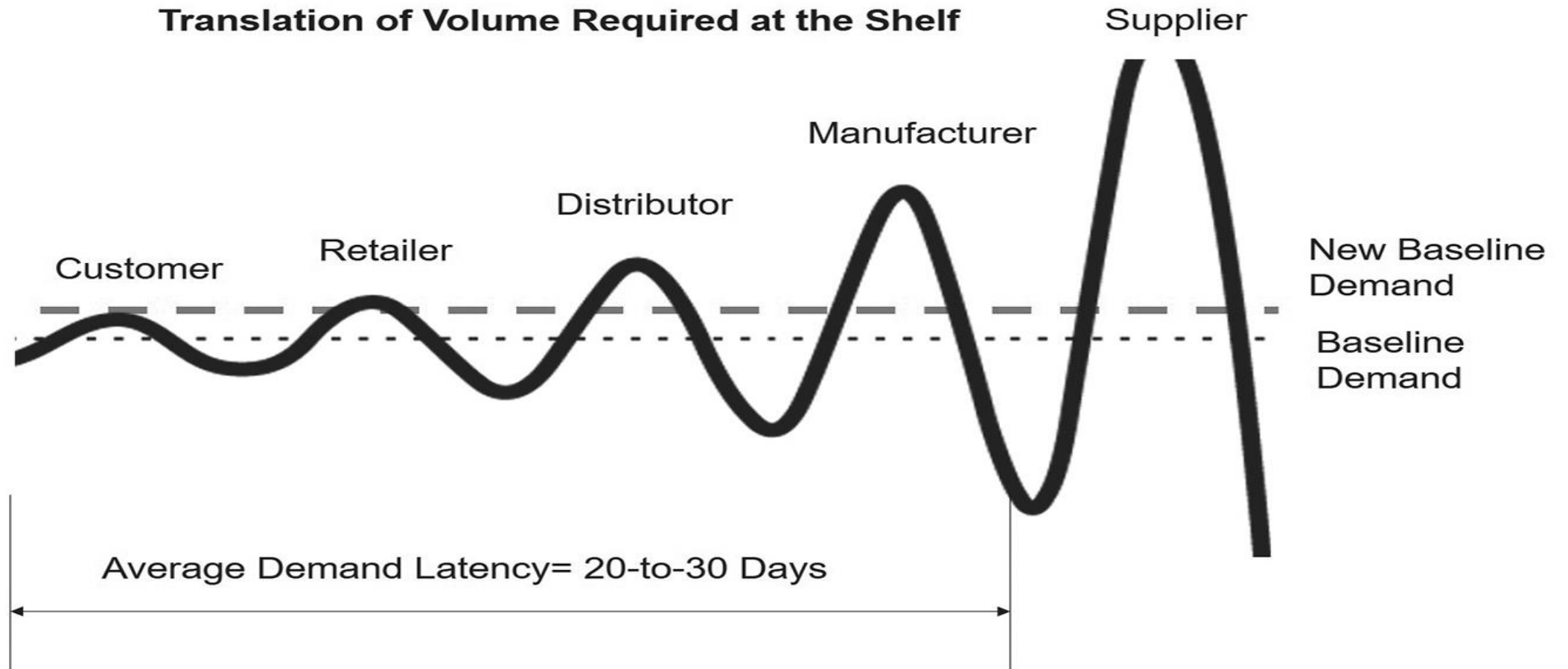
Large Consumer Products Company

Listen to the animation

BSH CASE STUDY

BIGGEST IMPACT? REDEFINING TIME

- **Market Latency:** The translation of a market signal to a buying pattern to a visible order pattern.
- **Demand Latency:** The time to translate channel purchase data pattern to an order through replenishment processes.
- **Process Latency**: The time for the organization to make a decision.

Market Latency: 3-6 months	Demand Latency: 2-12 weeks	Process Latency: 2-6 weeks

BSH brands – BSH Supply Chain Facts & Figures

Appliance Brands

Home Appliances under the brands

BOSCH SIEMENS GAGGENAU NEFF Balay Coldex PROFiLO JUNKER Thermador Constructa PITSOS

Ecosystem Brand

Home Connect

Service Brands

kitchen stories SIMPLY YUMMY WeWash BlueMovement

	More than 10,000 products (SKU)
	Ten thousands of customers
	Ten thousands of order lines per day
	150 warehouses
	40 factories
	Sales >30M appliances (MDA)
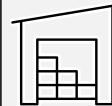
B/S/H/

Triggering success: the crucial role of forecasting in driving the entire supply chain

B/S/H/
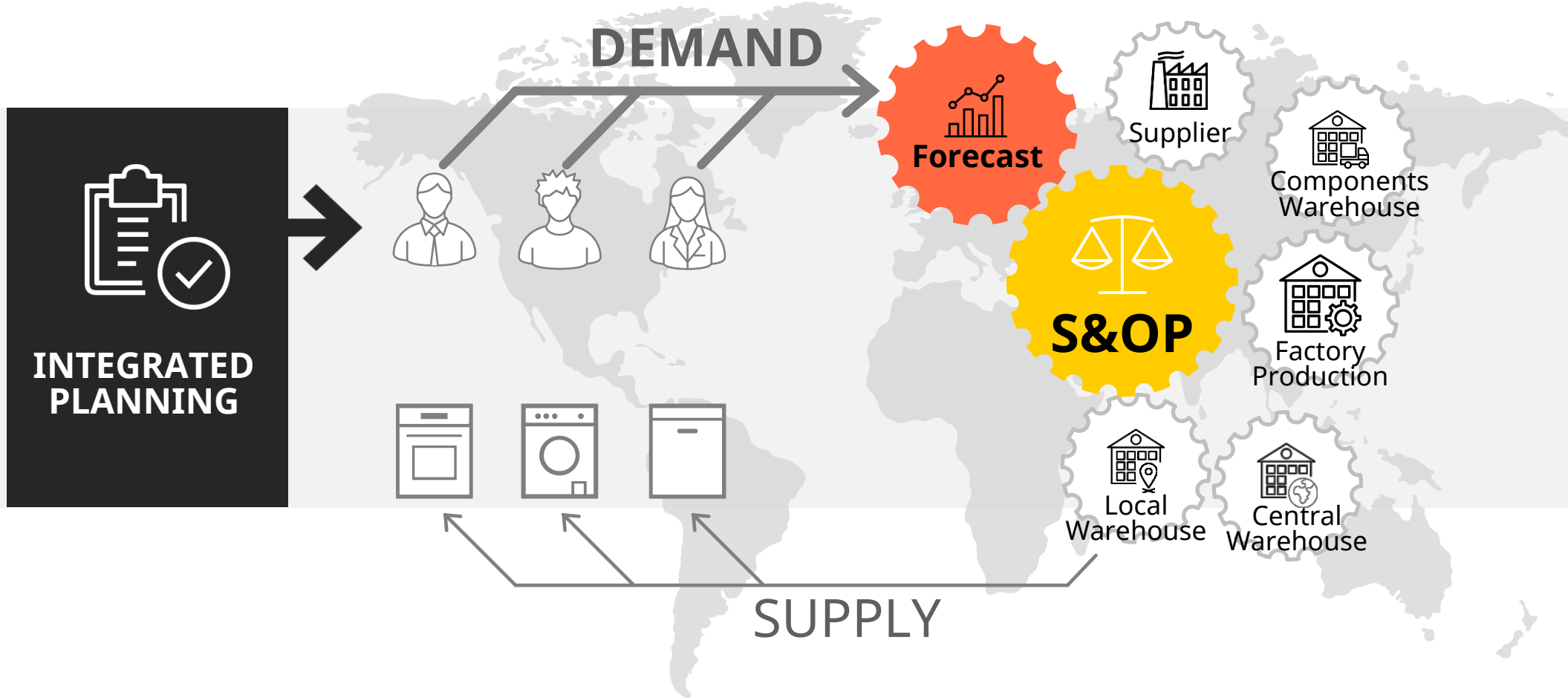
Focus is to adopt the Outside-In Demand Forecasting in our S&OP

Status quo (Traditional Time Series Forecast)

- Outdated methods
- Using only the historical data
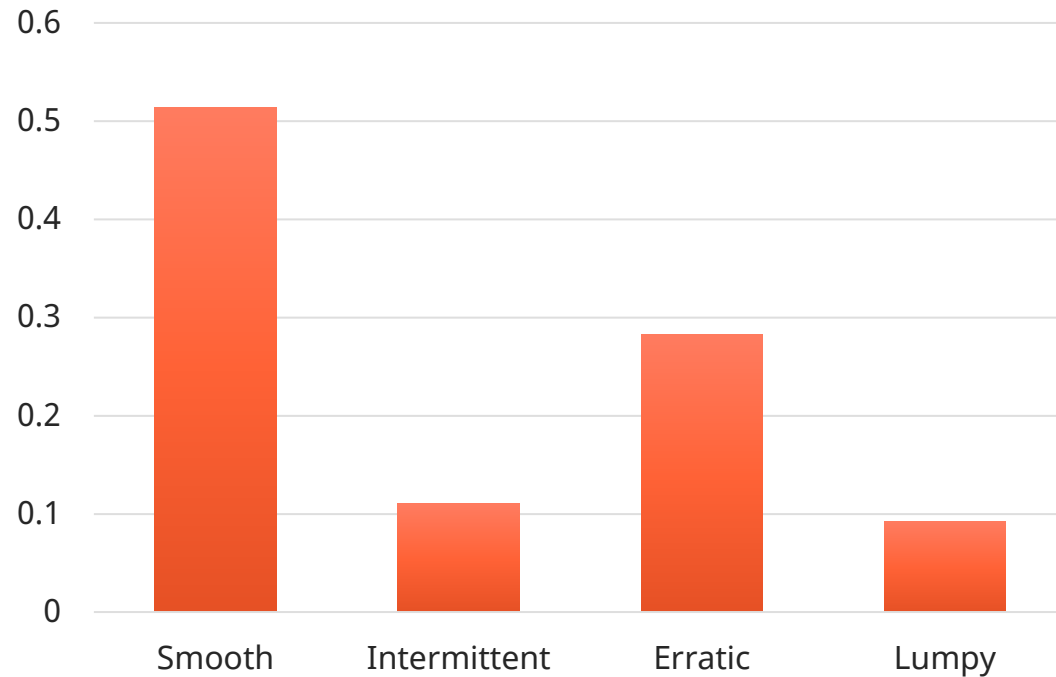- Not reflecting future risks
- Not reflecting demand shifts

Project goal (Outside-in Advanced Forecast)

- Advanced ML methods
- Using outside-in data
- Identifying future risks
- Reflecting demand shifts

Improved **product availability** and **service level** and reduced **inventory**

B/S/H/

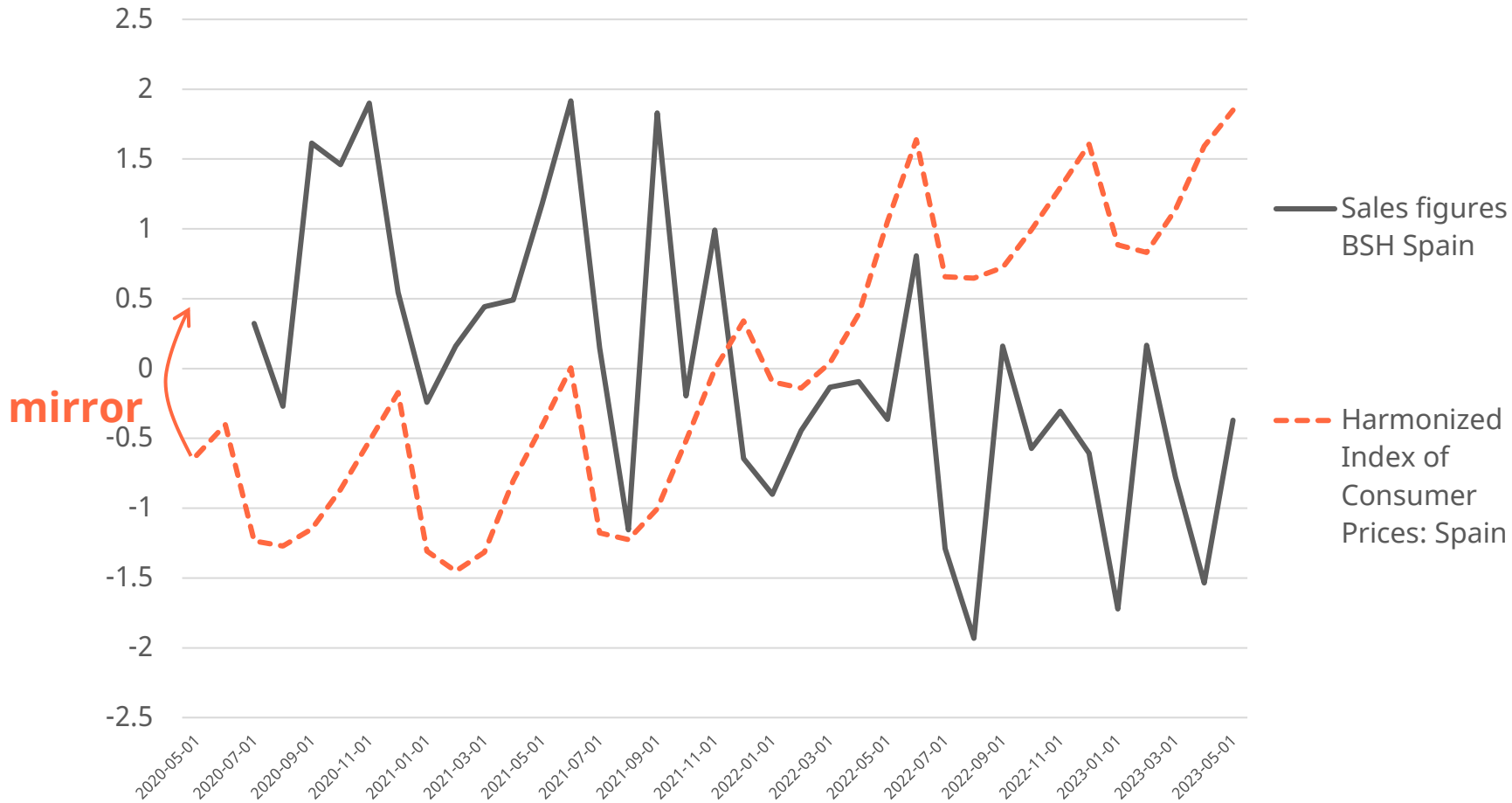# Outside-in approach improves accuracy even for unpredictable demand patterns

→ Through the implementation of an outside-in demand forecasting methodology, we can effectively forecast all products, including those that are newly introduced and lack predecessor data.

All figures presented in this slide are as of February 2024

50% of the items are **unforecastable**

has intermittent, erratic and lumpy demand patterns

50% of the items are **forecastable**

has smooth demand pattern

Explaining how outside-in works.....

Example: Spain

1. Sales figures BSH Spain

2. Add indicator

3. Mirror indicator

Legend:
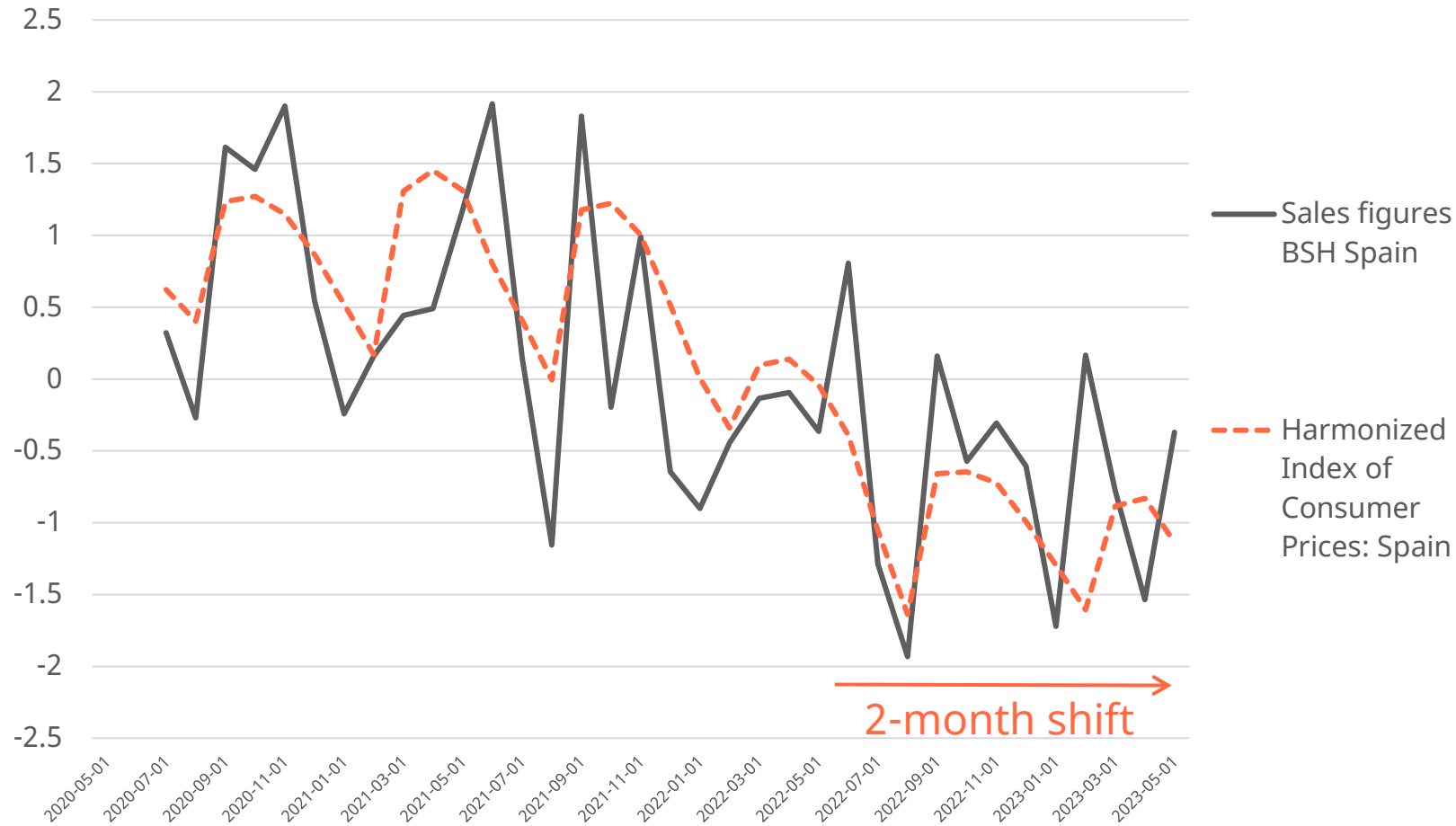— Sales figures BSH Spain
- - - Harmonized Index of Consumer Prices: Spain

All figures presented in this slide are as of June 2023

B/S/H/

Explaining how outside-in Causal Forecasting works.....

Example: Spain

Sales figures BSH Spain

Harmonized Index of Consumer Prices: Spain

2-month shift

All figures presented in this slide are as of June 2023
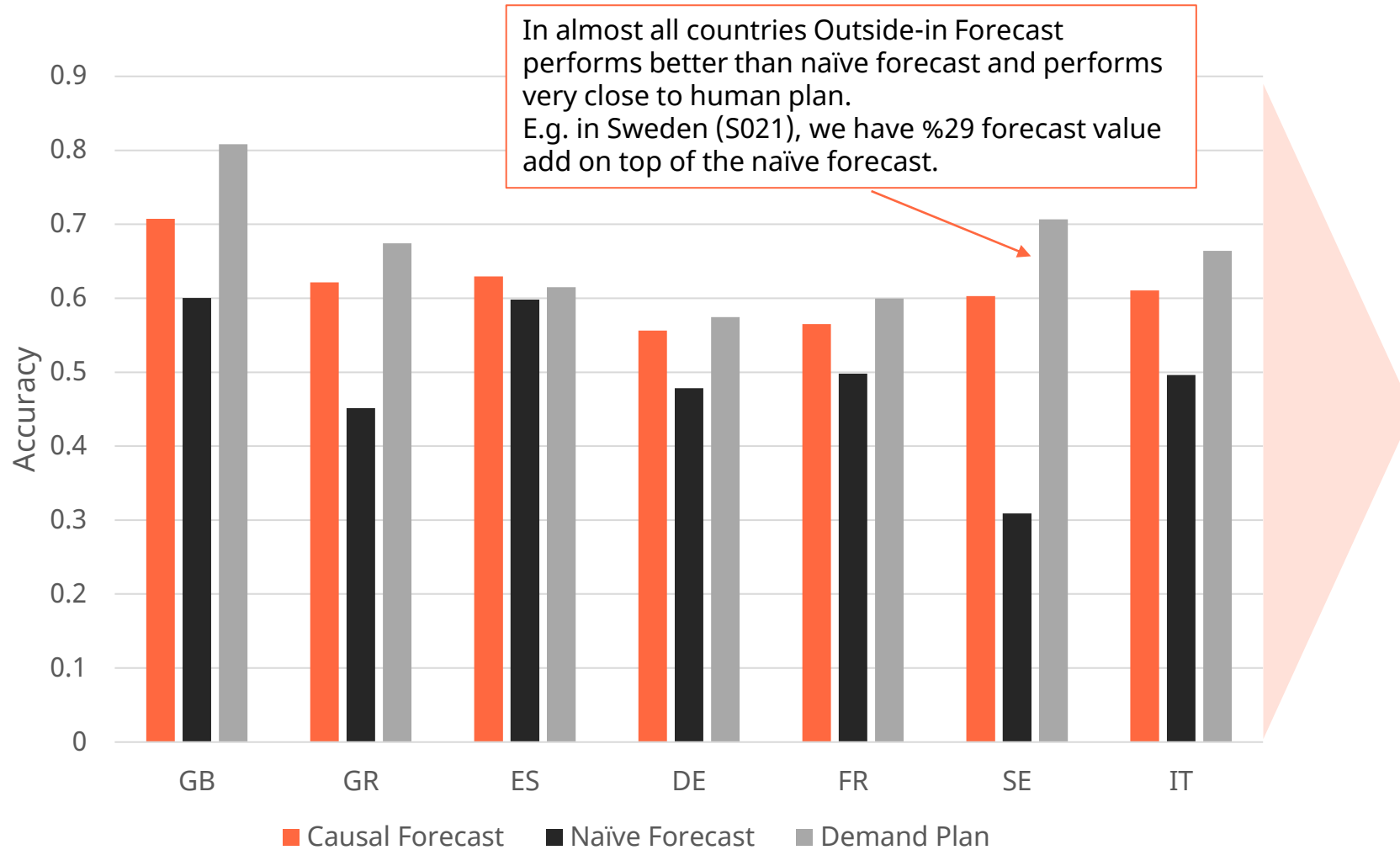
1. Sales figures BSH Spain
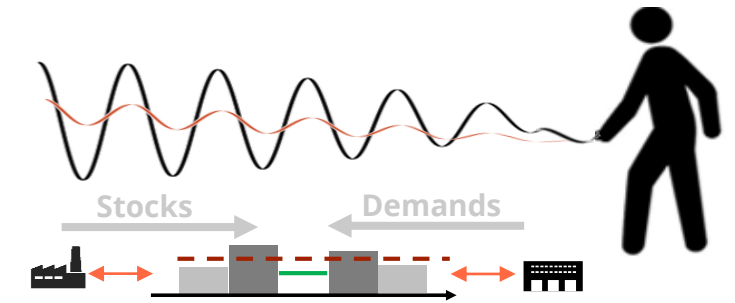
2. Add indicator

3. Mirror Indicator

4. Time shift indicator

5. Result / insight:
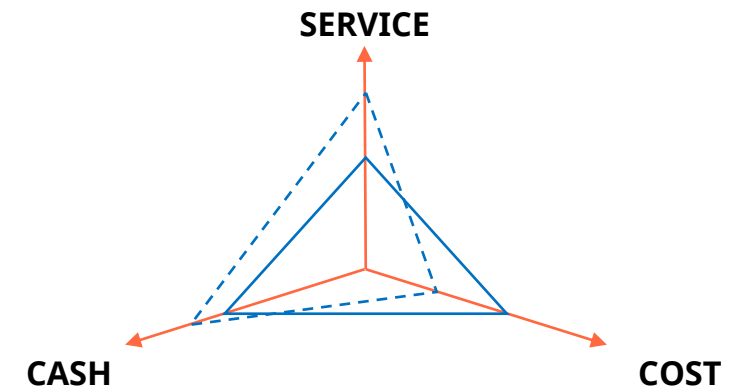**Two month latency** between **harmonized consumer prices Spain** and **sales figures BSH Spain**

B/S/H/

We have up to 29% forecast value add on naïve statistical forecast

In almost all countries Outside-in Forecast performs better than naïve forecast and performs very close to human plan.
E.g. in Sweden (S021), we have %29 forecast value add on top of the naïve forecast.

REDUCED BULLWHIP EFFECT

Stocks   Demands

IMPROVED KPIs

SERVICE

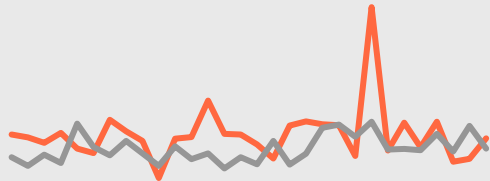CASH   COST
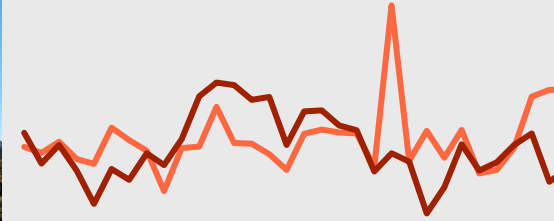
■ Causal Forecast   ■ Naïve Forecast   ■ Demand Plan

All figures presented in this slide are as of February 2024 – LAG 1

B/S/H/

Interpreting Bullwhip Amplification Factors Across the Supply Chain

CONSUMER → **RETAIL** CUSTOMER → **APPS** REGIONAL WAREHOUSE → **CSC** CENTRAL WAREHOUSE → **MANUFACTURER**

— sell_in — sell_out
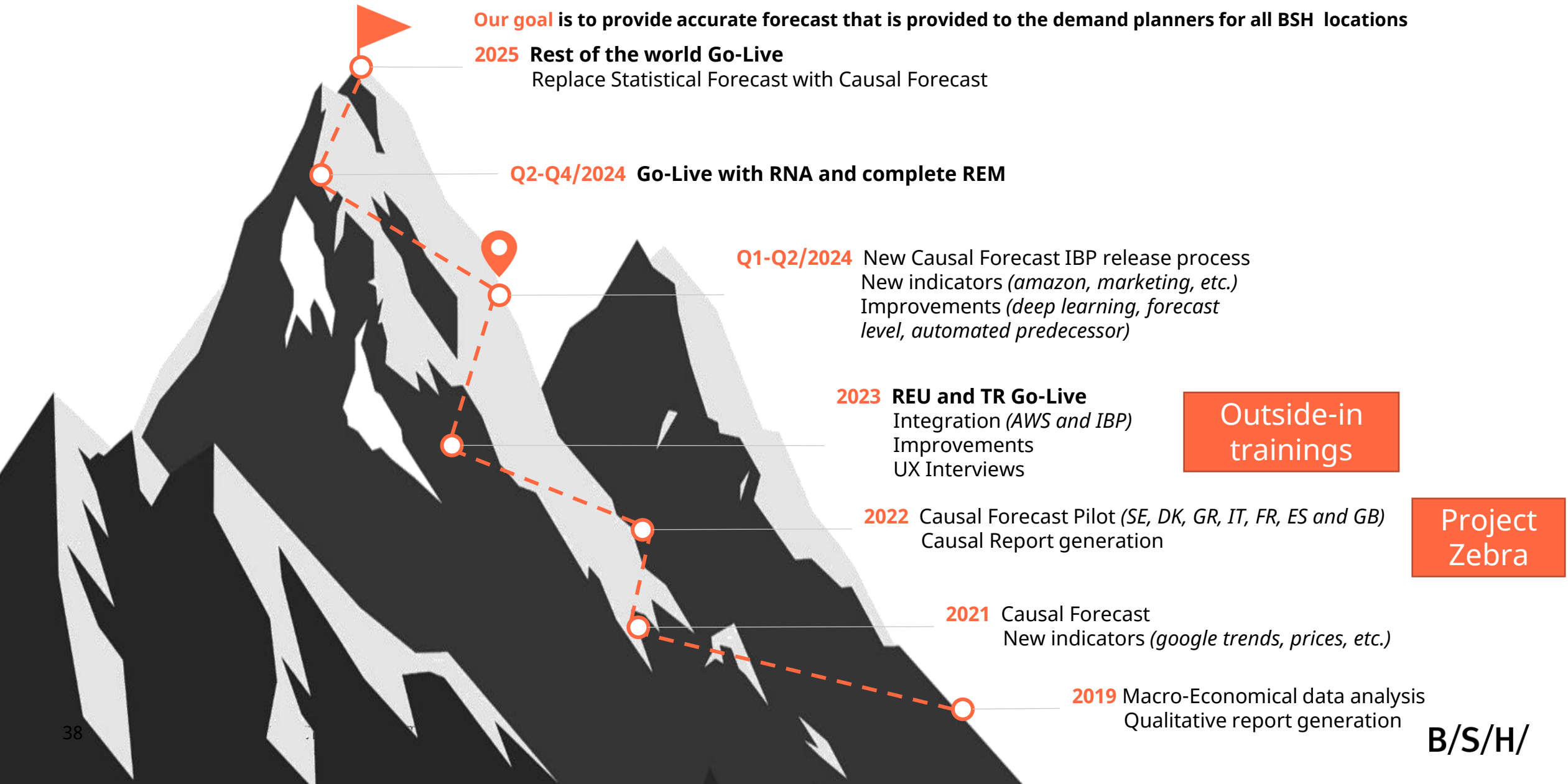
— sell_in — production_qty

Bullwhip amplification factor is 2.08

→ Fluctuations in consumer demand are amplified as they propagate from retailers to end consumers along the supply chain. This amplification leads to challenges such as inventory imbalances, stockouts, and production inefficiencies.

Bullwhip amplification factor is 1.35

→ The amplification of demand variability between sales to retailers and production quantities is less pronounced. This suggests that BSH is moderately effective at mitigating demand variability between these stages, though there is still room for improvement.
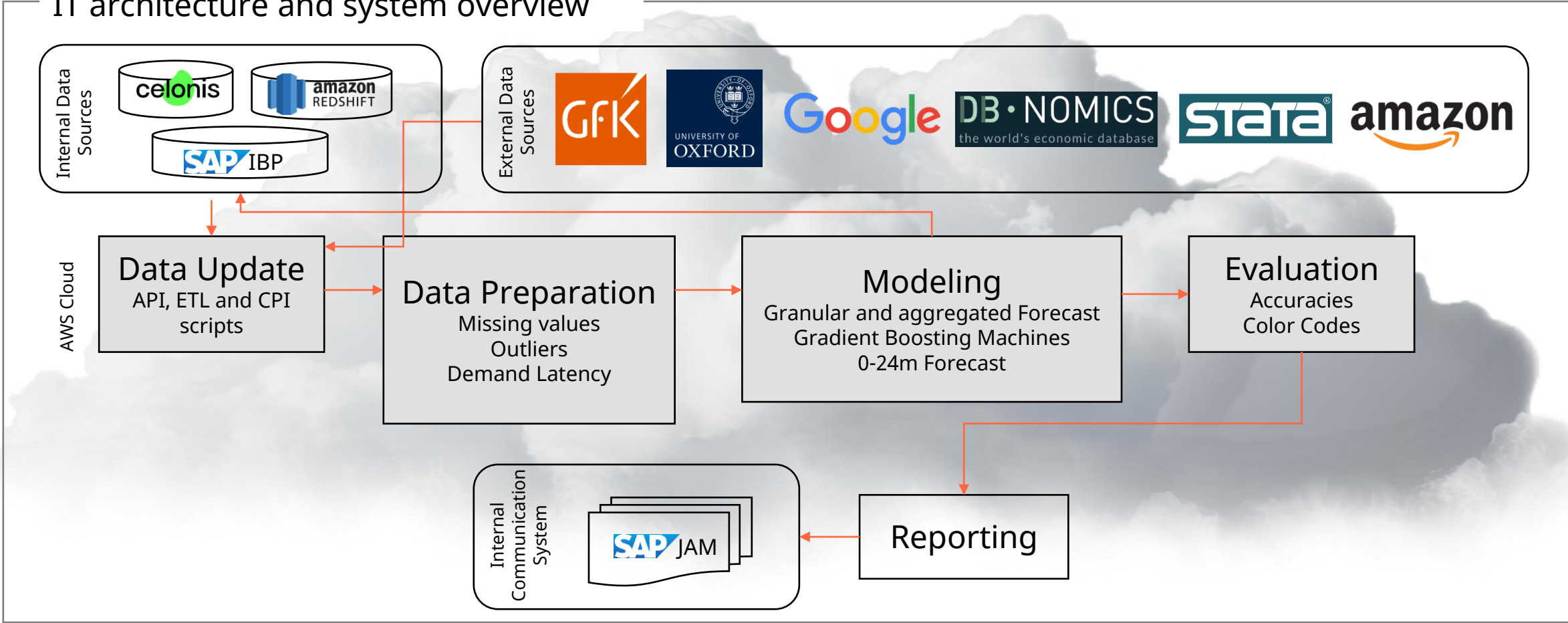
B/S/H/

Outside-in is a continuous journey!

Our goal is to provide accurate forecast that is provided to the demand planners for all BSH locations

2025 **Rest of the world Go-Live**
Replace Statistical Forecast with Causal Forecast

Q2-Q4/2024 **Go-Live with RNA and complete REM**

Q1-Q2/2024 New Causal Forecast IBP release process
New indicators *(amazon, marketing, etc.)*
Improvements *(deep learning, forecast level, automated predecessor)*

2023 **REU and TR Go-Live**
Integration *(AWS and IBP)*
Improvements
UX Interviews

2022 Causal Forecast Pilot *(SE, DK, GR, IT, FR, ES and GB)*
Causal Report generation

2021 Causal Forecast
New indicators *(google trends, prices, etc.)*

2019 Macro-Economical data analysis
Qualitative report generation

Outside-in trainings

Project Zebra

38

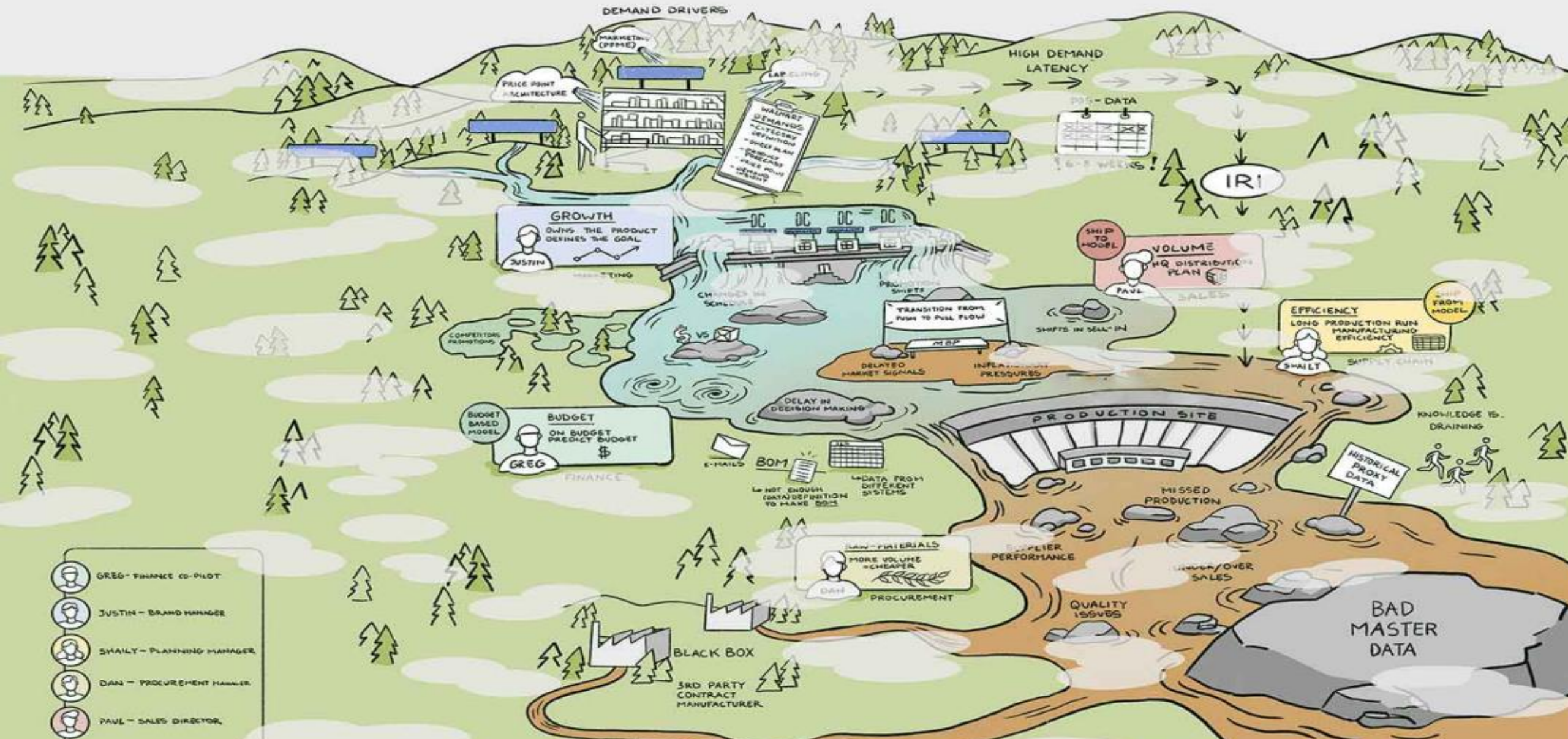B/S/H/

ML Pipeline is now running fully automatically on AWS Cloud Platform and SAP IBP

B/S/H/

Getting Clear on Definitions

1. Integration versus Interoperability
2. Need for semantic reconciliation.
3. Data and process latency.
4. Synchronization and data harmonization.

Flow of Demand in New Product Launch

The Process of Unlearning

Order or shipment data is not a good proxy for demand.	Added steps for "collaboration in S&OP" adds process latency.	Shift from a focus on error and bias in forecasting to flow.
Don't confuse signal generation with visibility.	Too many alerts without intelligence add noise and confusion.	We don't have end-to-end planning processes.
Manufacturing is not the only constraint. Need for bi-directional orchestration across source, make, and deliver.	Business leaders need to figure out what to do next. How do you start?	Data does not have to be perfect.
The need for price/volume trade-offs.	How do we define effective "what-if" frameworks?	The efficient supply chain is not the most effective—the movement from a cost-based agenda to margin.
What-if for demand to visualize the impact of demand shaping.	We need to know how good the model is—building trust in the process/system.	There is a need for a visibility/decision layer to democratize planning.
Importance of form and function of inventory analysis.	Outside-in models are built by design. They are not an evolution.	Sharing of forecasts across trading partners is fool's play.

SECTION 6

Wrap-up

We Must Learn to Unlearn and Build Better

A Story

Moving Forward

1. Maximize value through a balanced scorecard.
2. Improve transparency.
3. Manage flow.
4. Rationalize complexity.

Questions?
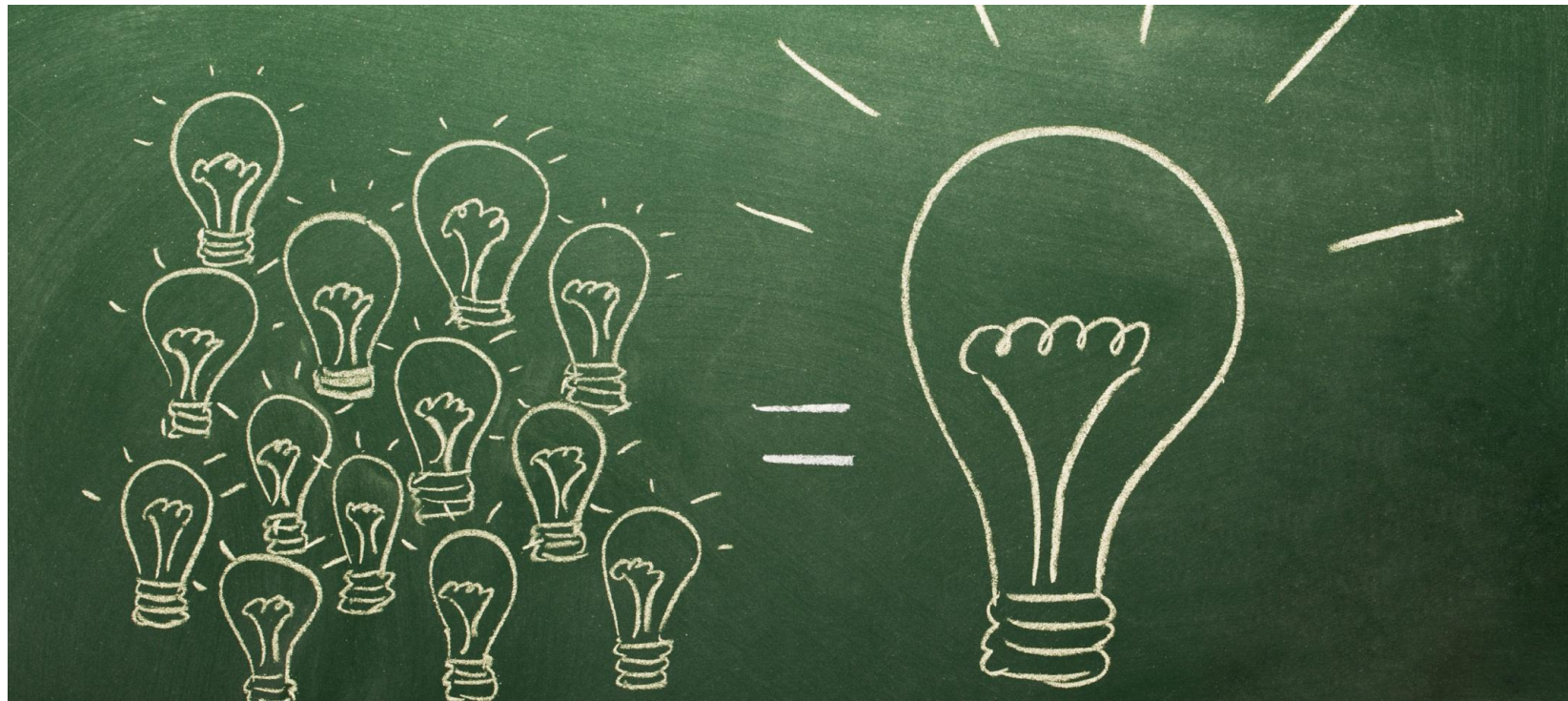
Supply Chain Insights™

Founded in February 2012 by Lora Cecere, **Supply Chain Insights LLC** is in its twelfth year of operation. The Company aims to deliver independent, actionable, and objective advice for supply chain leaders. Our goal is to help leaders understand supply chain trends, evolving technologies, and which metrics matter.

Thank You…

LORA CECERE, FOUNDER | lora.cecere@supplychaininsights.com