



# DESIGN FOR UNCERTAINTY

**Chris Armbruster**

Director

Supply Chain Strategy

Agere Systems

**Globalization**



**Outsourcing**



**Immediacy**



**Leanness**



**UNCERTAINTY**



or



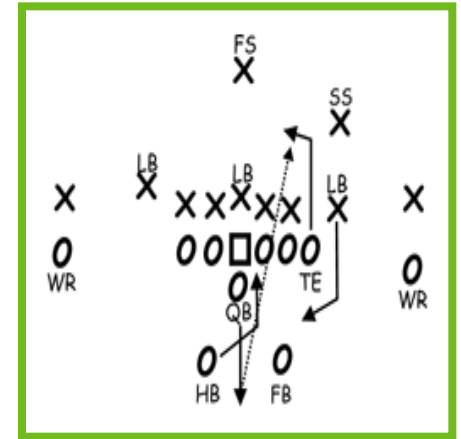
## Understand the Demand



## Improve the Signal



## Execute Relevant Strategy



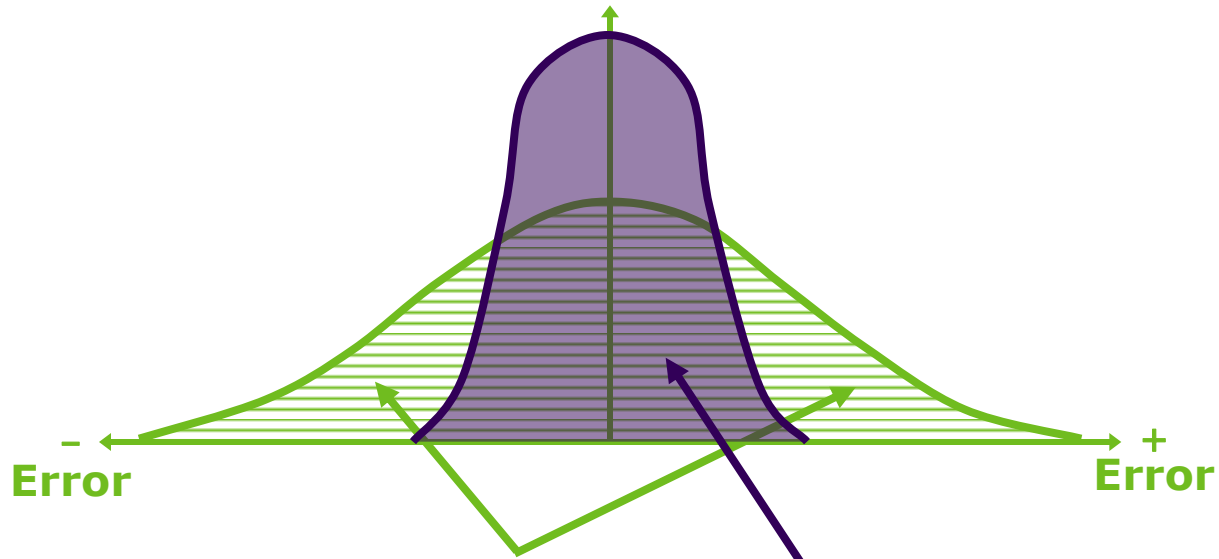
# Understanding Demand



Notwithstanding its fickle nature, uncertainty can be understood, characterized, bounded and modeled.

- The data exists, but must be **mined** for meaningful information.
- Business intelligence is a key input to developing a **relevant** fulfillment strategy.



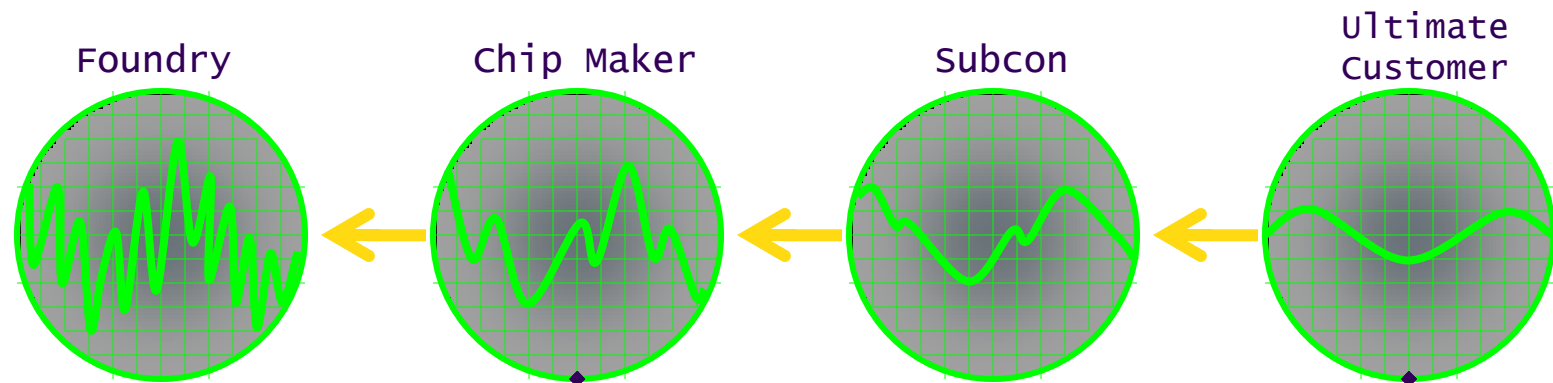


Propagation Error

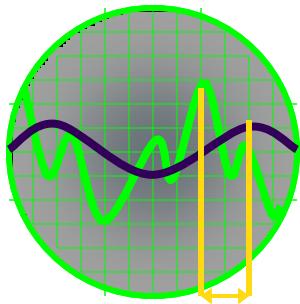
Market Error

**As demand propagates up the supply chain, the demand signal degrades.**

**Forecasts are often based on uncertain markets.**

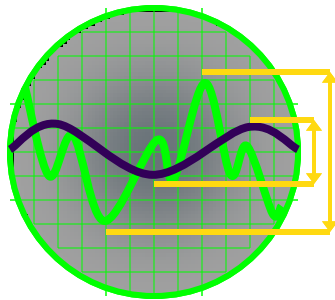


Phenomenon 1  
(Latency)



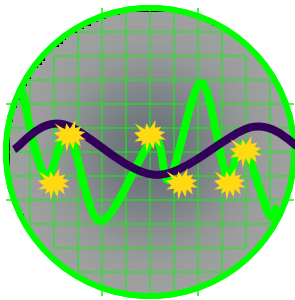
Demand can become out of phase or shift in time.

Phenomenon 2  
(Amplification)



Changes in demand can become exaggerated.

Phenomenon 3  
(Interference)



Noise can superimpose onto the demand signal.

**Uncertain Demand**

# How well do you understand your demand?

- Timing
- Size
- Range
- Trend
- Seasonality
- Bias
- Volatility
- Leading Indicators



# Improving the Signal



**Visibility**

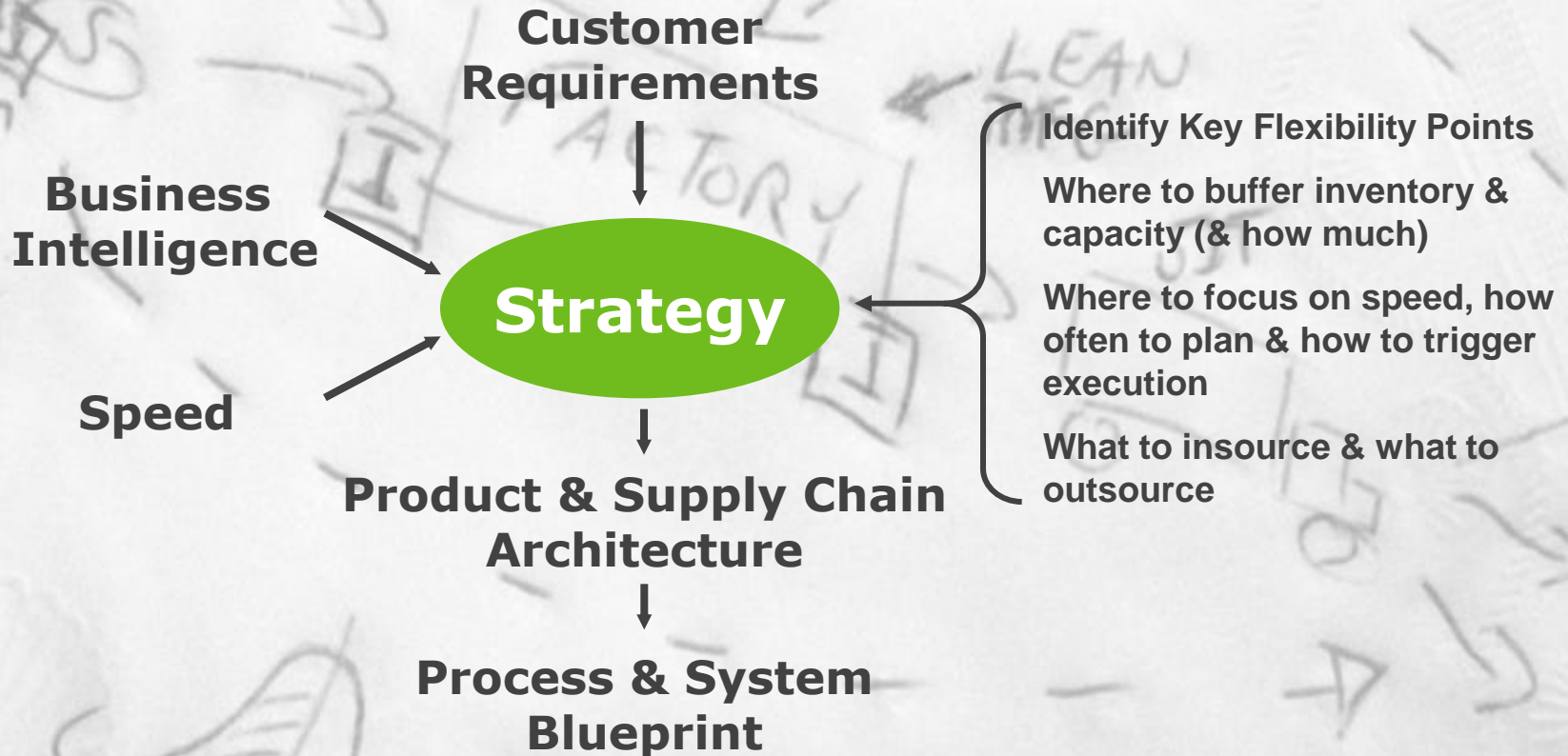


**Collaboration**



**Multi-tier Execution**

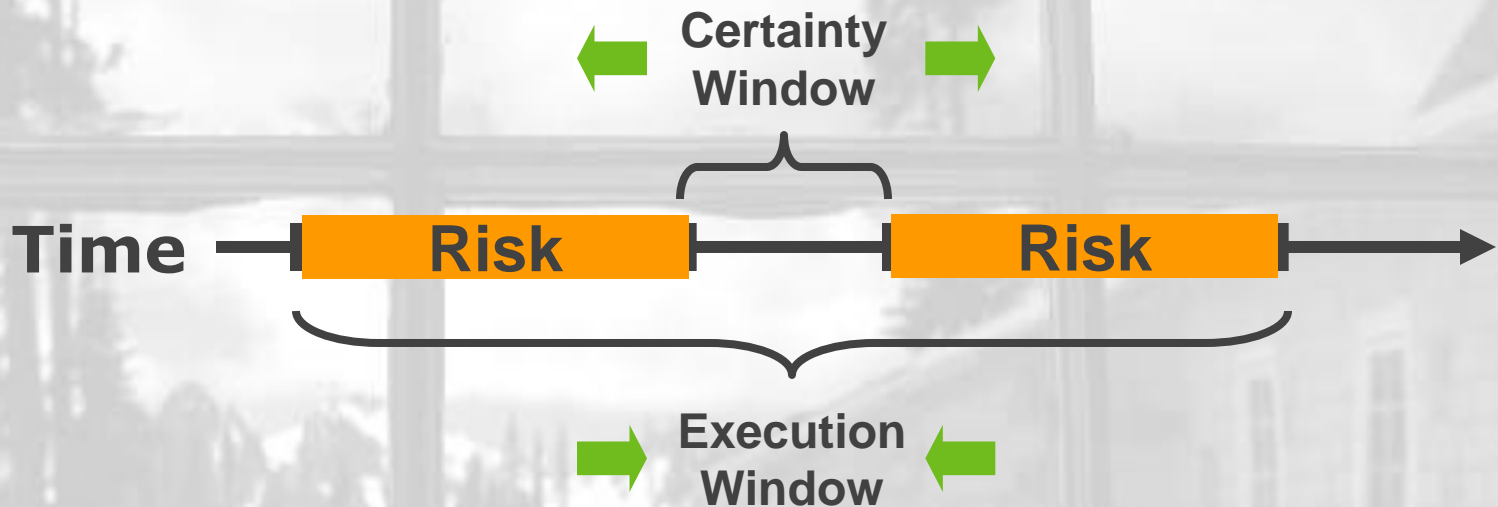
# Fulfillment Strategy



# The Role of Speed

## *All About Aligning Windows*

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- Speed of info stretches certainty window
- Speed of operations shrinks execution window

# **How Agere Deals with Uncertainty**

# About Agere

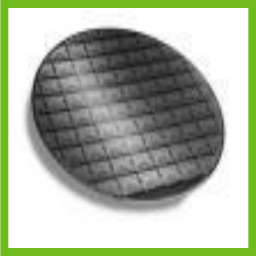
## **\$1.9B FY04 Revenue**

- No. 1 in chips for hard disk drives
- No. 1 in chips for wired communications
- No. 1 in chips for wireless infrastructure
- Top ten customers by revenue: Apple, Cisco, HP, Lucent, Maxtor, NEC, Nokia, Samsung, Seagate, Western Digital

Employees:	6,000
Central Campus:	Allentown, Pa.
Regional Offices:	
Santa Clara, CA	Ascot, UK
Shanghai, China	Hong Kong
Assembly & Test Sites:	Thailand & Singapore

# About Our Supply Chain

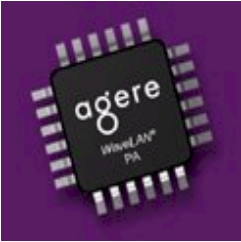
**Wafer  
Fabrication**



**4-12 Wks**



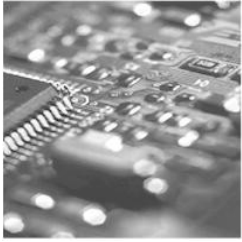
**Package  
Assembly  
& Test**



**2 Days**



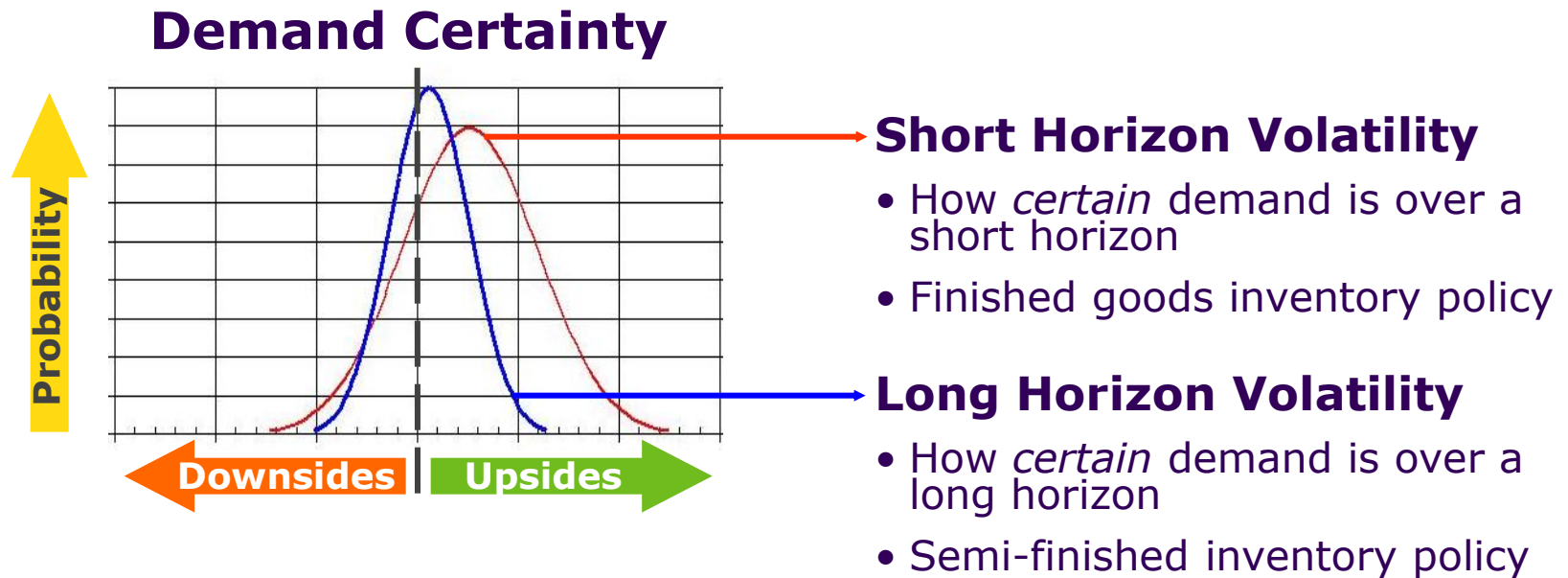
**Circuit  
Board  
Assembly**



**Hours**



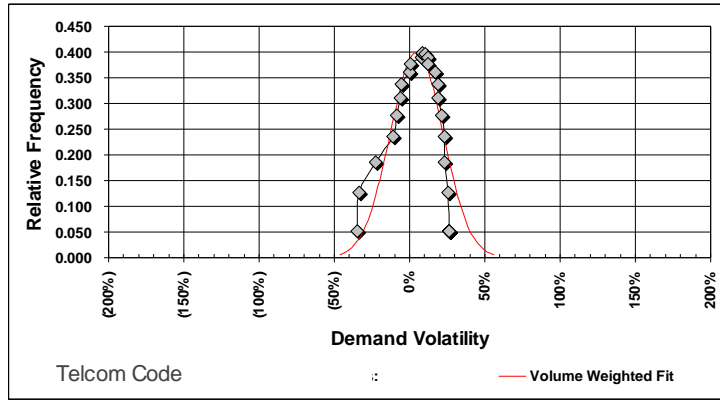
# Understanding Demand Through Profiling



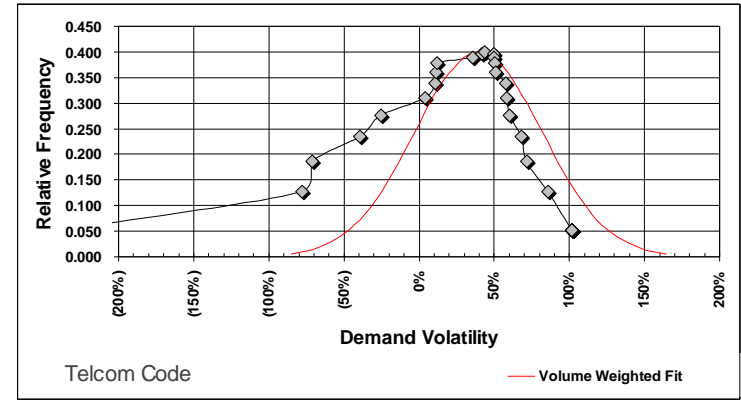
**Our customers are somewhat certain about their demand over a quarter, but beyond the current week they are not sure when in the quarter it will materialize.**

# Typical Telcom Industry

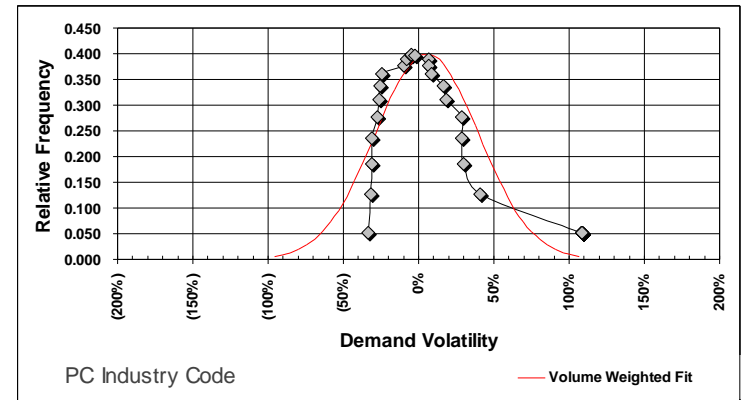
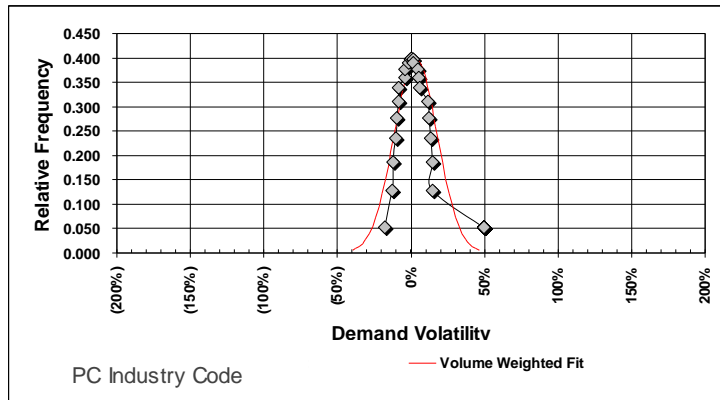
## Long Horizon



## Short Horizon



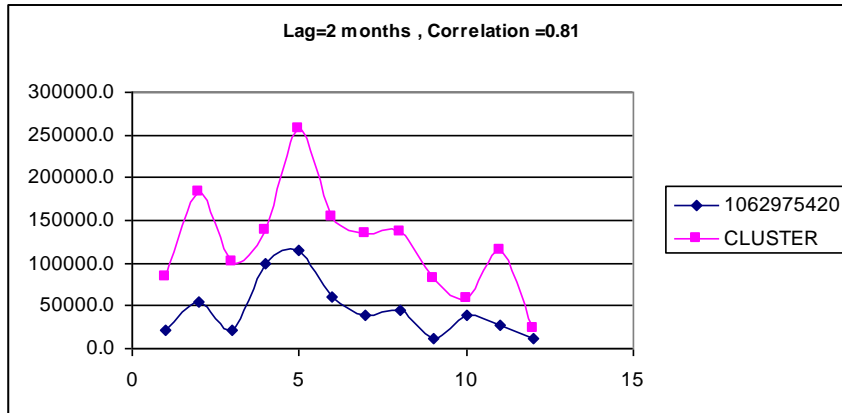
# Typical PC Industry



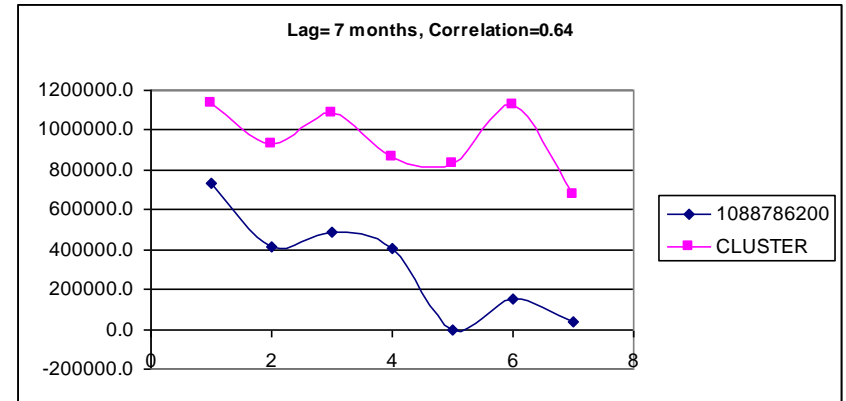


# Leading Indicators for Clusters

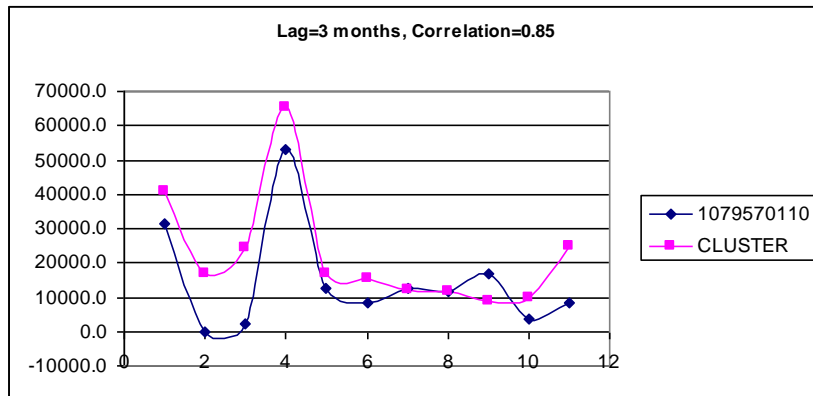
## Cluster- 3



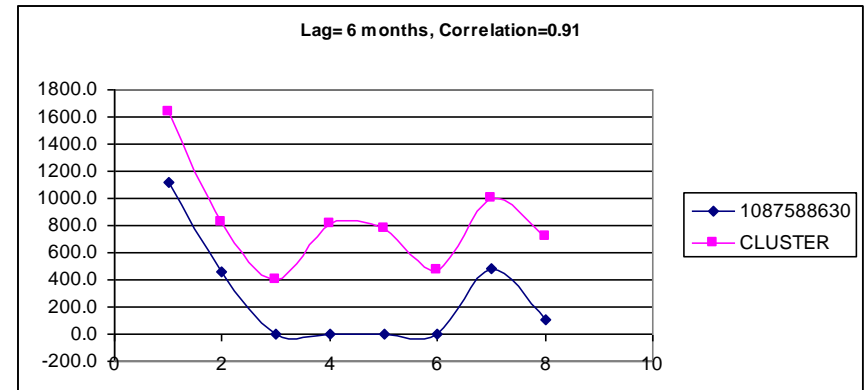
## Cluster- 6



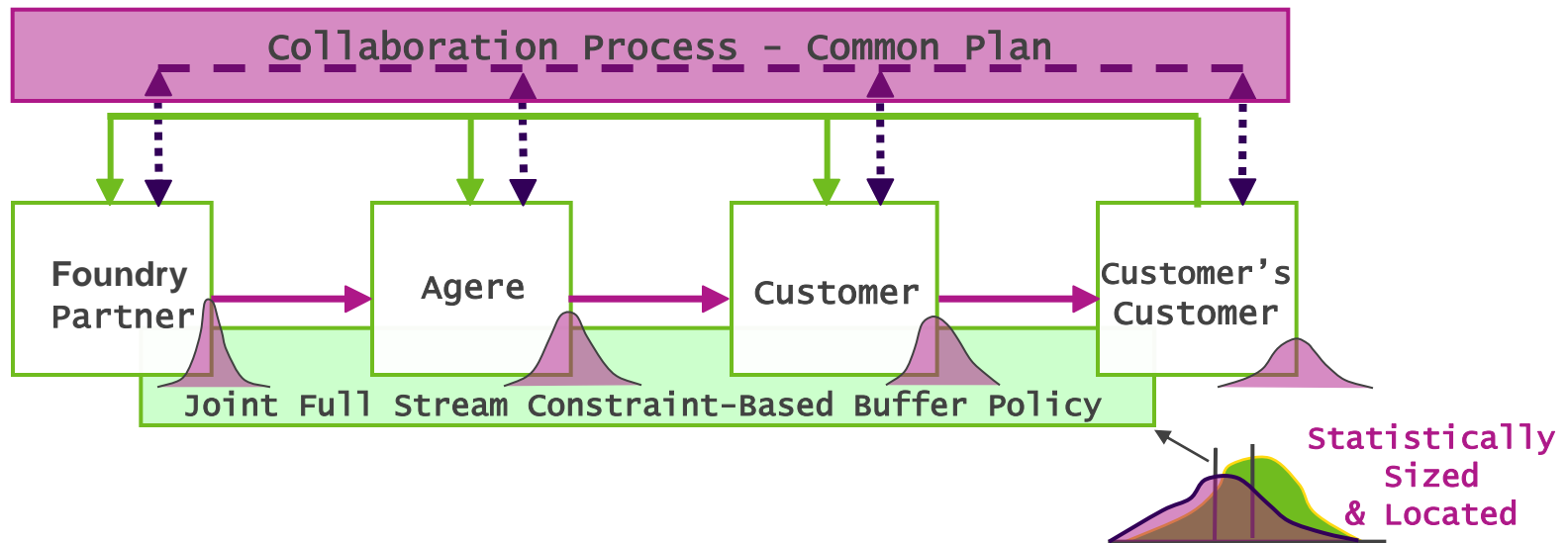
## Cluster- 7



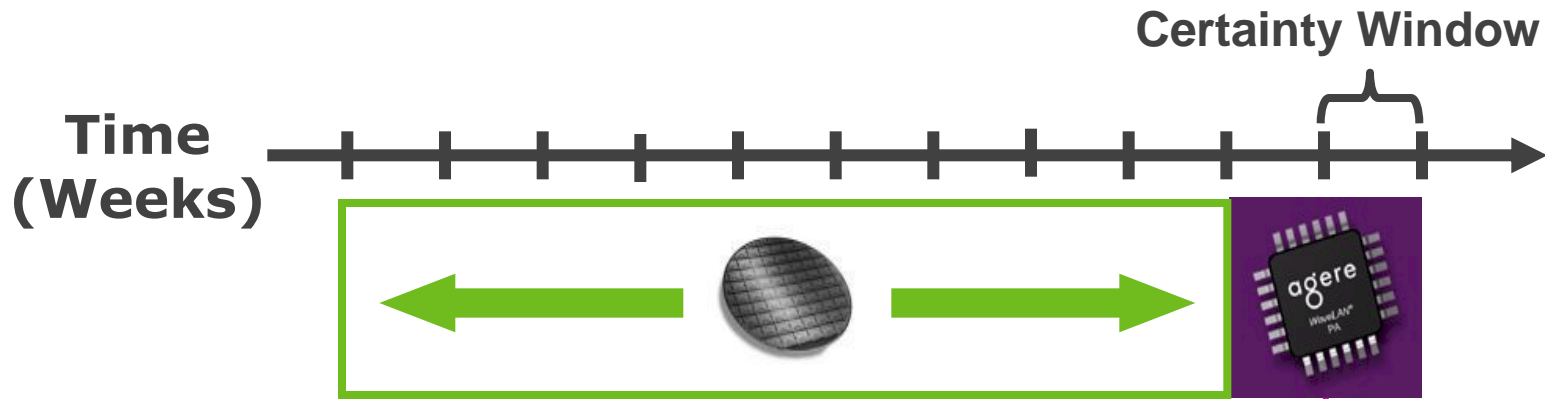
## Cluster- 8



# Improving Demand Through Collaboration

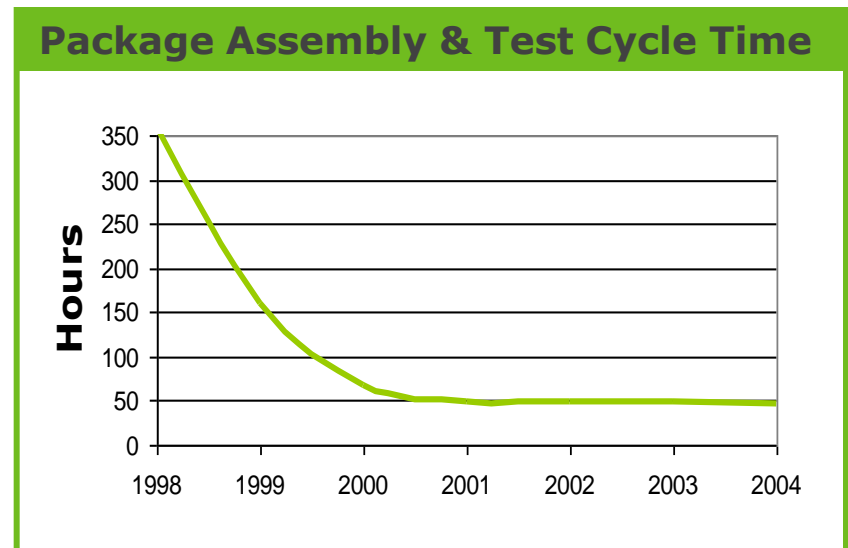


# Executing a Relevant Fulfillment Strategy



**Lean Manufacturing**

Shrink Execution Window for Package Assembly & Test Operations to Fit Inside Certainty Window



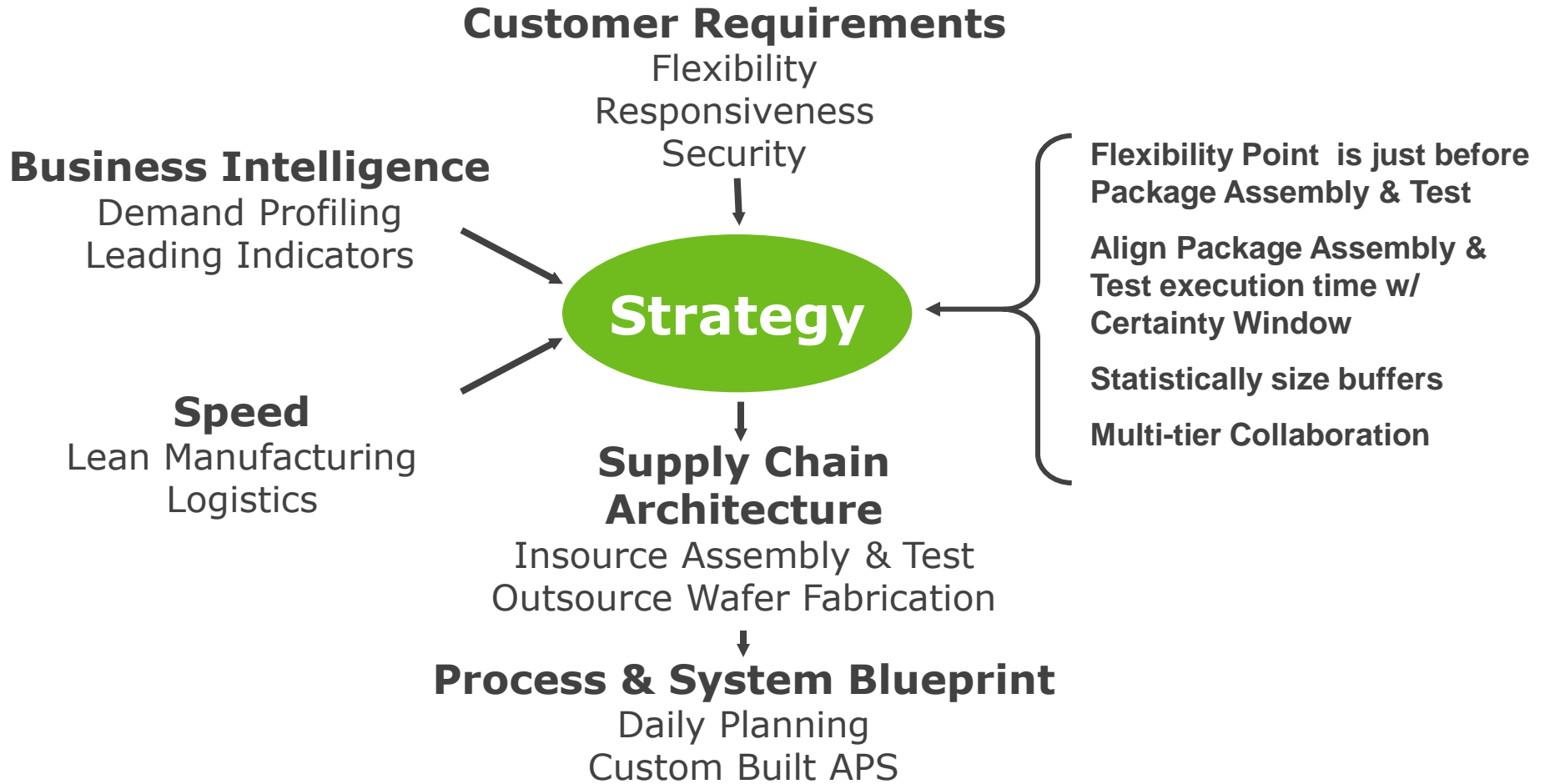
# Aligning Processes



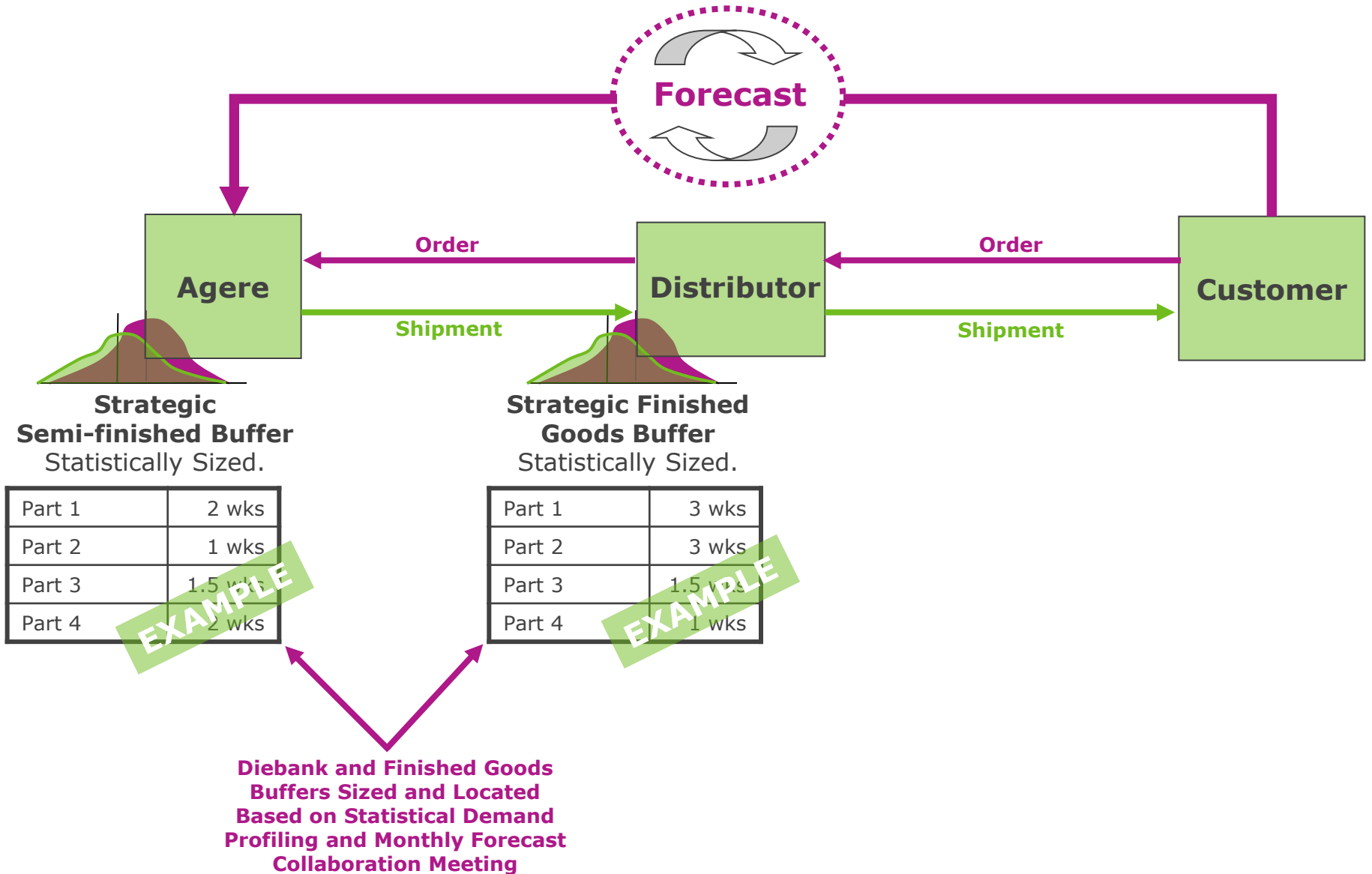
**24 Hour Planning Cycle**

**JIT Fulfillment & Delivery**

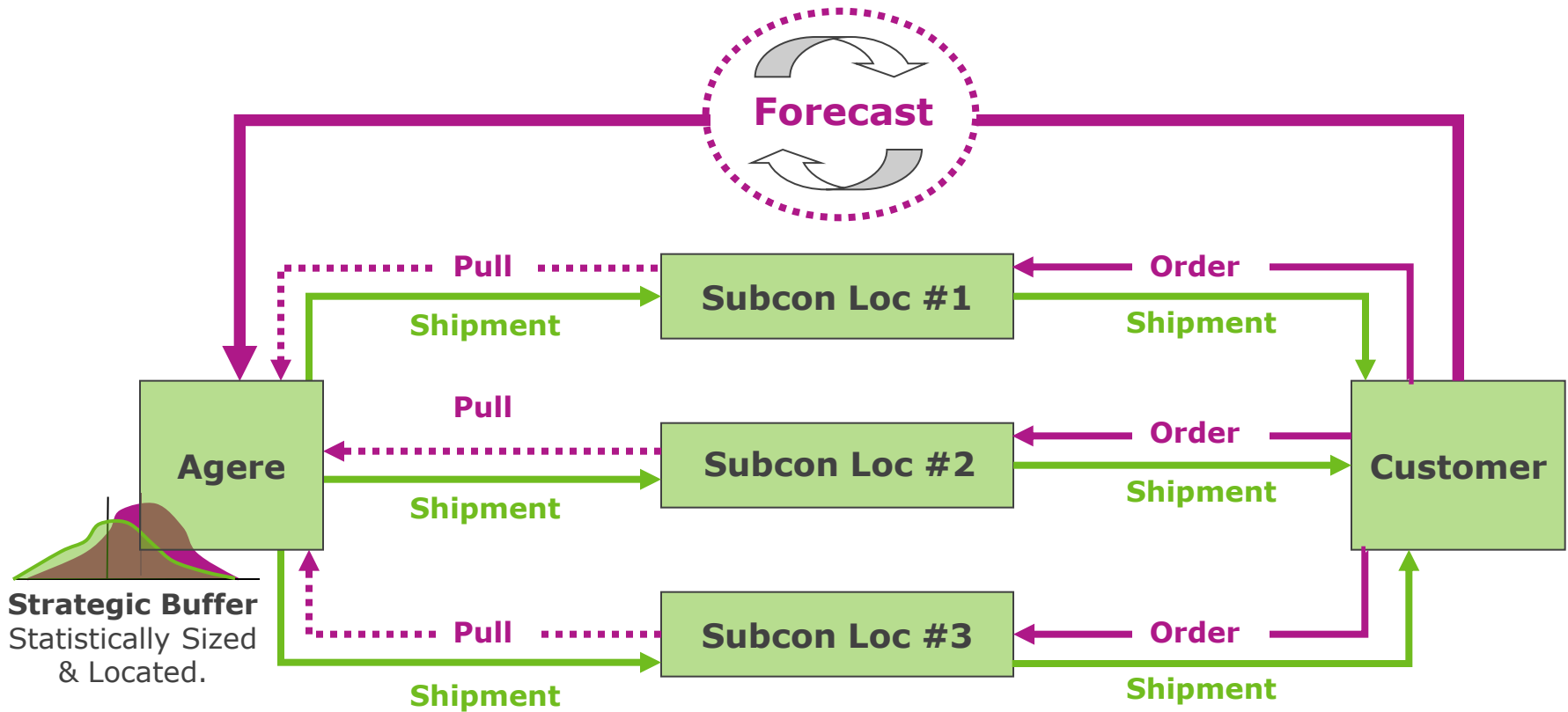




# Collaboration Model: Customer, Distributor & Agere



# Collaboration Model: Customer, Subcon & Agere



**Thank You!**  
**Questions?**