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DEMAND PLANNING AND FORECASTING IS NOT ONLY ABOUT THE SOFTWARE

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1. **Abstract of the Presentation**
2. **Introduction Demand Planning and Forecasting**
3. **Prerequisites Demand Planning**
4. **Technology**
5. **Questions & Answers**

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Abstract of the presentation

- Supply Chain Planning technology have been modified over time
- Forecasting models have changed over time including their uses in the business
  - Statistical models have been modified for forecasting purpose
  - A number of new forecasting models have emerged over time and even some forecasting models have been adapted to certain industries

BUT

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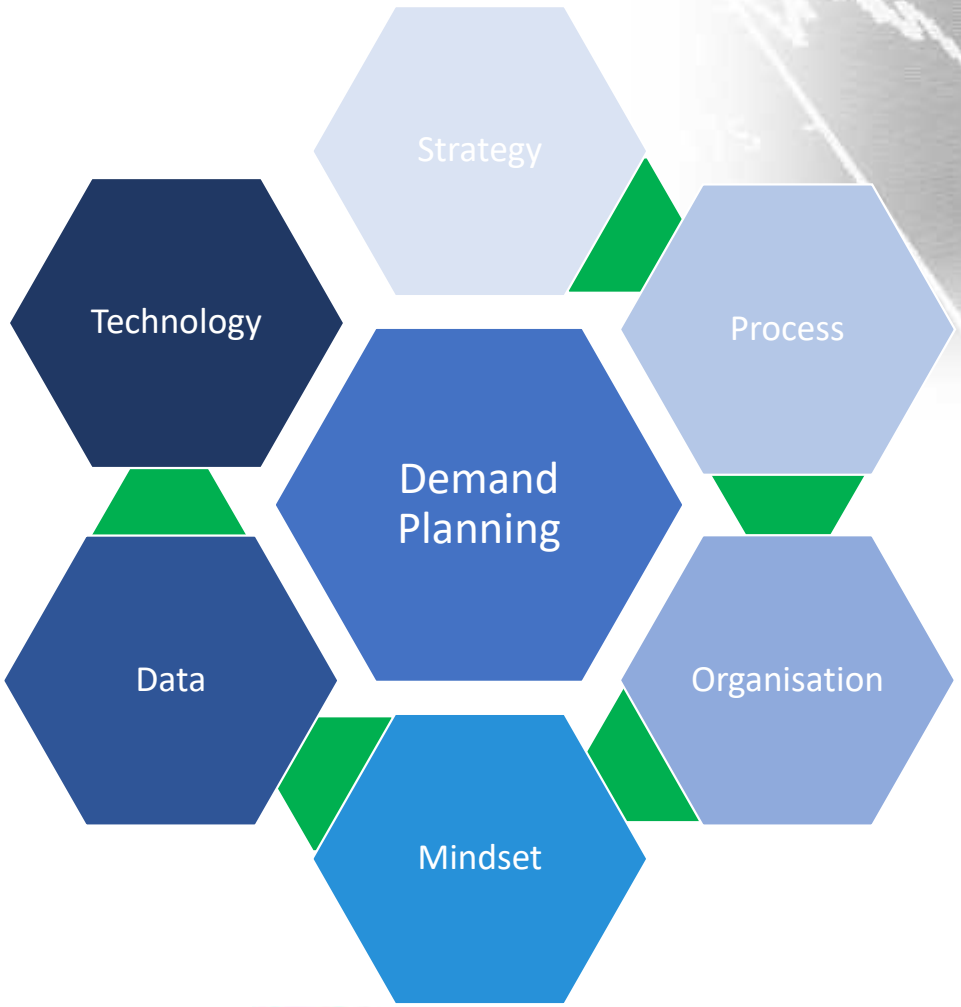
Abstract of the presentation



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Introduction Demand Planning/Forecasting

- Fundamentals of Demand Planning/Forecasting:
  - Demand Planning is the overall process, forecasting is part of this process
  - Forecast is not a goal, budget or plan
    - A goal is what we would like to achieve
    - A budget is based on expectations
    - Forecast is based on a plan
  - All variables are not equally forecastable(you can calculate the forecastibility)
  - Forecast horizon depends on the lead time
  - Different planning domains requires different requirements
  - Variations in demand are not only caused by internal forces but also external forces

Introduction Demand Planning/Forecasting

- Fundamentals of Supply Planning:
  - Forecast drive the Supply Chain
  - Forecast based on the consumer demand reduce the bullwhip effect
  - Safety stock is affected by the forecast horizon(the longer the horizon, the more uncertainty)
  - Production capacity and demand forecasts are independent of each other(although there is a close link)
  - Demand variability affects inventory: the higher variability in demand, the more difficult it is to forecast
  - The more levels we have in the supply chain the more difficult it will be

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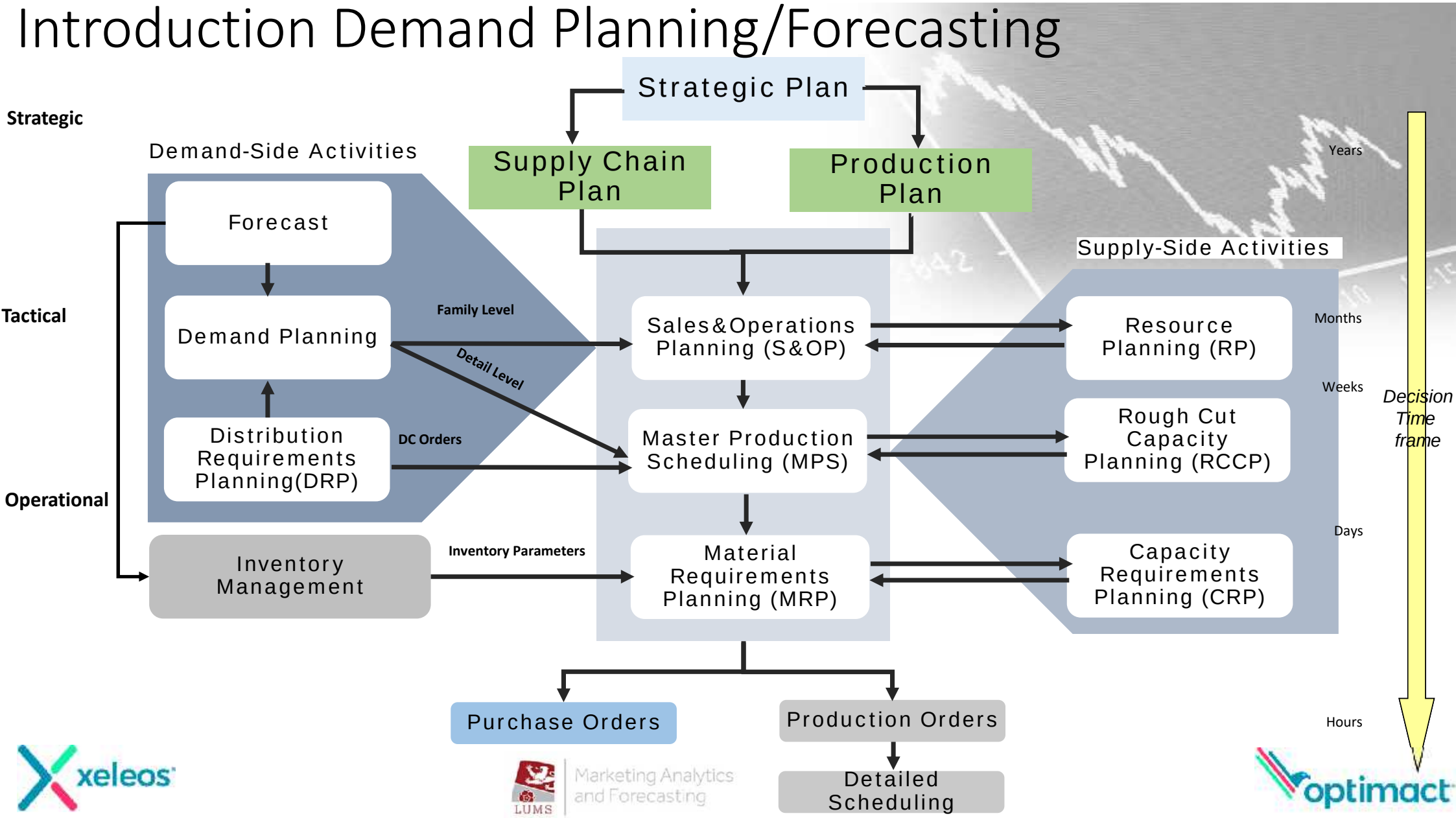
Introduction Demand Planning/Forecasting



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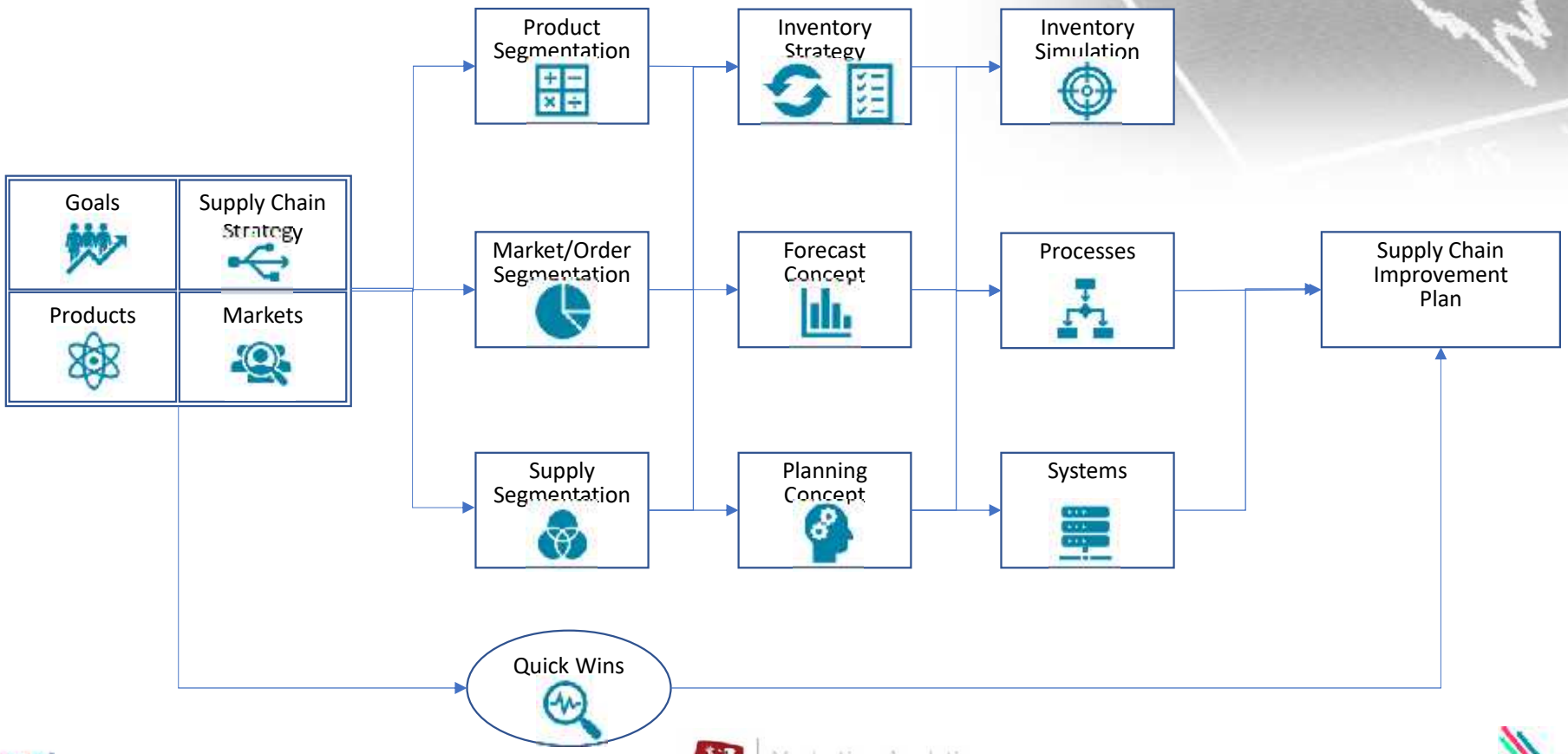
Prequisites for an Efficient and Effective Demand Planning



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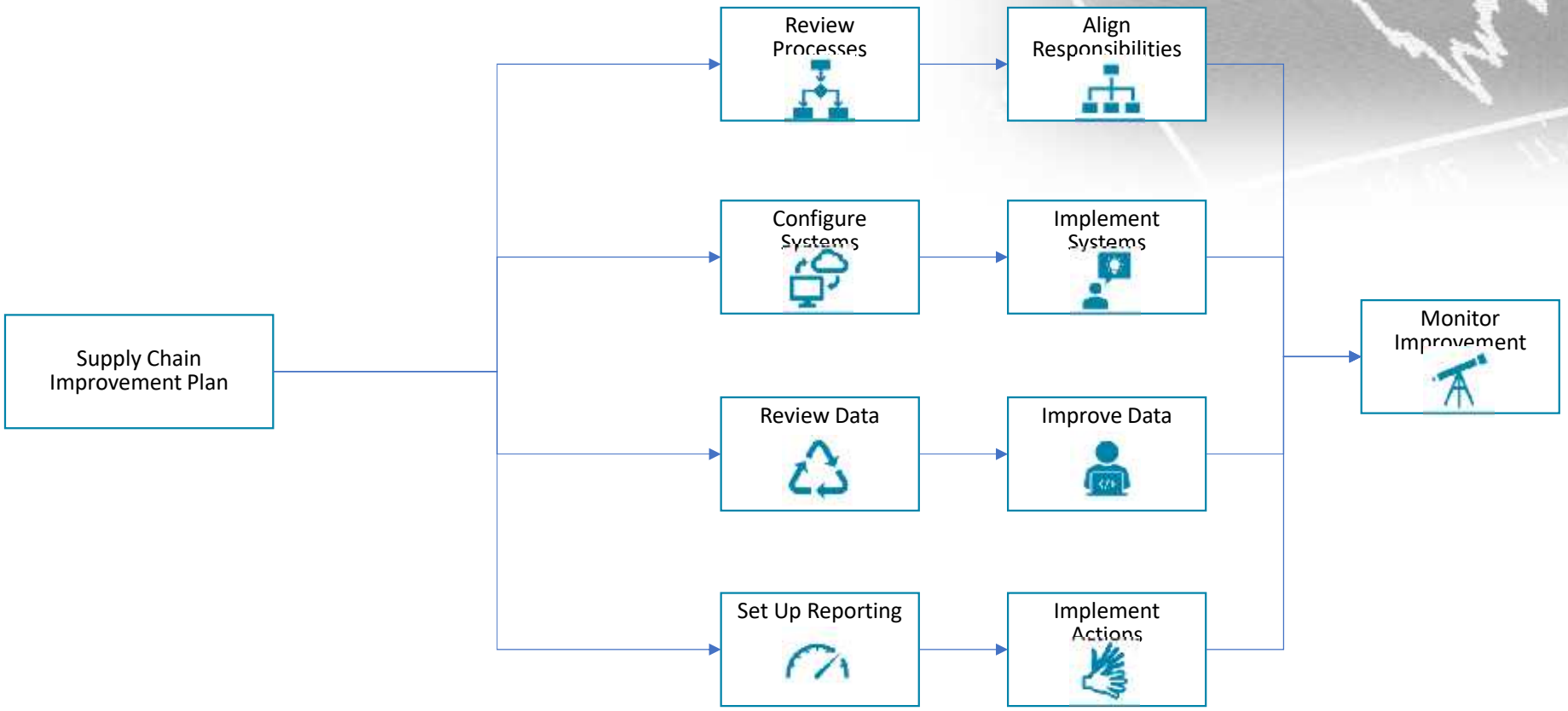
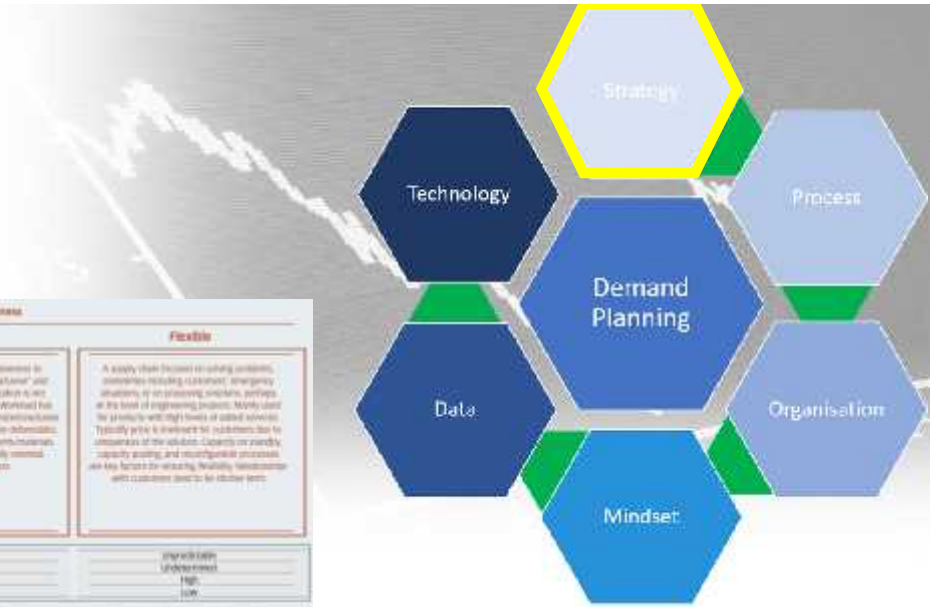
Prequisites for an Efficient and Effective Demand Planning



Strategy

- What is your Supply Chain Strategy?



		Oriented to Efficiency			Oriented to Responsiveness		
		Continuous flow	Efficient	Fast	Custom-configured	Agile	Flexible
Business framework	Demand variation Product lifecycle Market mediation cost Relevance of assets to total cost	Low Long Low Medium to high	Medium to high Long Low Medium to high	Medium to high Short Medium to high Low to high	High Short to medium High Low to high (before PDP*)	High Short to medium High Low to medium	Unpredictable Undetermined High Low
Competitive Positioning	Main differentiation in service Main differentiation in product	High inventory turnover Best performance-cost ratio	Perfect orders Best price	Short time from idea to market Continuous portfolio renewal	User-friendly, low-effort order entry Configurable product	Agility relative to demand changes Customizable product	Understanding of customers' needs Adaptable process
Managerial Focus	End-to-end Servicing Product Transformation processes Sourcing	Collaborative relationships to build synergies Information sharing for continuous improvement Designed for fast changeover and quick manufacturability Regular schedule in an optimal sequence of SKUs Collaborative relationships to build synergies	Efficiency Perfect orders Low cost on standard performance High rate of asset utilization Lowest total cost supplier opportunities	Continuous portfolio renewal Short time from idea to market Fast product development process High rate of asset utilization / capacity pooling for peaks Pool of suppliers with short lead times and oriented to innovation	Product configurability Order accuracy Modular design for multiple configurations High rate of asset utilization before PDP / extra capacity after PDP Agile response to changes in demand	Agile response to changes in demand Short lead time Designed for small batches Extra capacity in manufacturing and downstream Short lead time	Resource flexibility Understanding of customers' needs Supported by complementary services Asset flexibility / capacity pooling Agile response and process flexibility to adapt to customers' requirements
Supply Chain Profile	Demand buffering Order penetration point Minimum order size Order cycle Collaborative relationships Inventory strategy Customization Asset utilization rate Production cycle Rate (ratio) of workload Sourcing buffering	Inventory of finished product Make to stock Customers' replenishment needs Replenishment according to a fixed cycle Strategic relationships with key customers to build synergies Small and frequent batches to increase inventory turns No High to very high As short as possible to reduce batch sizes Smoothed by customer demand Inventory / own supplier for each key component	Inventory of finished product Make to forecast, in some cases make to order Minimum economic transportation batch Fixed lead time or fixed cycle Not relevant High level of inventory to optimize production efficiency No very high As long as possible to increase batch sizes and efficiency Smoothed by rolling forecast Inventory / best-cost supplier on each occasion	Inventory of finished product (generic or mass customization) Make to forecast Collective forecast According to collection schedule Cooperative to anticipate market trends / joint design A single batch per SKU, based on the collection forecast Usually no, but maybe in exceptional cases High to very high As short as possible to reduce time from idea to market Smoothed by collection forecast Pool of suppliers	Inventory before decoupling point, extra capacity after PDP Configured to order / assembly to order Old consumers' needs or customers' replenishment needs As short as possible according to orders in PDP queue Cooperative with key customers to anticipate aggregate demand at PDP Inventory just before PDP Yes, just in PDP and downstream processes High before PDP, medium after PDP Long before PDP, short in PDP and downstream Smoothed by rolling forecast before PDP, peaks after PDP Inventory / pool of suppliers	Extra capacity Make to order / make to stock Minimum economic production batch or minimum economic transportation batch As short as possible according to customers' orders in queue Cooperative with some customers to anticipate capacity requirements Materials / components under a common platform Relevant in manufacturing and downstream processes Medium to high Variable according to customers' orders accepted in queue Peaks and valleys of high magnitude Inventory / pool of suppliers	Variable capacity / capacity pooling Design to order Minimum economic production batch and/or specific for each situation Flexible, as short as possible Understanding of "available to promise" at any moment Low inventory level and inventory pooling Relevant in design and downstream processes Low to medium, in some cases standby capacity for occasional use As short as possible to reduce lead time Capacity on standby for occasional use, high peaks when used Pool of suppliers for critical resources

*PDP = product decoupling point

		Oriented to Efficiency			Oriented to Responsiveness		
		Continuous-flow	**Efficient**	**Fast**	**Custom-configured**	**Agile**	**Flexible**
		A supply chain focused on building synergies supported by collaborative relationships. Low working capital for customers is the main deliverable. Workload is smoothed by customer's demand. Order penetration point is "make to stock" in order to ensure medium-high utilization rates with a high level of perfect orders. Production, driven by market demand, is designed to replenish predefined inventory levels.	A supply chain focused on lowest cost. Used for functional and commoditized products. Weakest value proposal when used in an isolated way; useful when used as a backbone for supporting mixed strategies. Efficiency is supported by a high asset utilization rate based on a "make to forecast" model in order to maintain continuous production and ensure an optimal production sequence, thereby reducing setup time.	A supply chain focused on competitive cost and continuous portfolio renewal. Short time "from idea to market" and an affordable cost are main deliverables. Used for functional and short-lifecycle products oriented to fashion. Demand is "pushed" by a "collection" forecast. Fast product development is critical capability. Applied by "fashion creators," especially in industries such as apparel and beauty products.	A supply chain focused on product configurability, where several product features are customized among a set of limited options. Normally oriented toward the end user. Workload before product's decoupling point is smoothed by forecast. Extra capacity after decoupling point and design for easy assembly or postponement are key elements for agility. Order accuracy is a relevant factor in order to ensure fulfillment of customized orders.	A supply chain focused on responsiveness to unpredictable demand. Used for "exclusive" and short-lifecycle products. Asset utilization is not sufficiently relevant in the total cost. Workload has medium size peaks and valleys. Customized/exclusive products and short order cycle are main deliverables. Extra capacity and common components/materials are key elements for agility. Normally oriented toward industrial customers.	A supply chain focused on solving problems, sometimes including customers' emergency situations, or on proposing solutions, perhaps at the level of engineering projects. Mainly used for products with high levels of added services. Typically price is irrelevant for customers due to uniqueness of the solution. Capacity on standby, capacity pooling, and reconfigurable processes are key factors for ensuring flexibility. Relationships with customers tend to be shorter-term.
Business Framework	emand variation	Low	Medium to high	Medium to high	High	High	Unpredictable
	oduct lifecycle	Long	Long	Short	Short to medium	Short to medium	Undetermined
	arket mediation cost	Low	Low	Medium to high	High	High	High
	elevance of assets in total cost	Medium to high	Medium to high	Low to high	Low to high before PDP*	Low to medium	Low
Competitive Positioning	Main differentiation in service	High inventory turnover	Perfect orders	Short time from idea to market	User-friendly, low-effort order entry	Agility relative to demand changes	Understanding of customers' needs
	Main differentiation in product	Best performance/cost ratio	Best price	Continuous portfolio renewal	Configurable product	Customizable product	Adaptable process
Managerial Focus	End-to-end	Collaborative relationships to build synergies	Efficiency	Continuous portfolio renewal	Product configurability	Agile response to changes in demand	Resource flexibility
	ervicing	Information sharing for continuous improvement	Perfect orders	Short time from idea to market	Order accuracy	Short lead time	Understanding of customers' needs
	oduct	Designed for fast changeover and quick manufacturability	Low cost at standard performance	Fast product-development process	Modular design for multiple configurations	Designed for small batches	Supported by complementary services
	ansformation processes	Regular schedule in an optimal sequence of SKUs	High rate of asset utilization	High rate of asset utilization / capacity pooling for peaks	High rate of asset utilization before PDP / extra capacity after PDP	Extra capacity in manufacturing and downstream	Asset flexibility / capacity pooling
	Sourcing	Collaborative relationships to build synergies	Lowest-total-cost supplier (opportunistic)	Pool of suppliers with short lead times and oriented to innovation	Agile response to changes in demand	Short lead time	Agile response and process flexibility to adapt to customers' requirements
Supply Chain Profile	Demand buffering	Inventory of finished product	Inventory of finished product	Inventory of finished product (current or next collection)	Inventory before decoupling point, extra capacity after PDP	Extra capacity	Standby capacity / capacity pooling
	Order penetration point	Make to stock	Make to forecast, in some cases make to order	Make to forecast	Configured to order / assembly to order	Make to order / make to stock	Design to order
	Minimum order size	Customers' replenishment needs	Minimum economic transportation batch	Collection forecast	End consumers' needs or customers' replenishment needs	Minimum economic production batch or minimum economic transportation batch	Minimum economic production batch and/or specific for each situation
	Order cycle	Replenishment according to a fixed cycle	Fixed lead time or fixed cycle	According to collection schedule	As short as possible according to orders in PDP queue	As short as possible according to customers' orders in queue	Flexible, as short as possible
	laborative relationships	Strategic relationships with key customers to build synergies	Not relevant	Cooperation to anticipate market trends / joint design	Cooperation with key customers to anticipate aggregate demand at PDP	Cooperation with some customers to anticipate capacity requirements	Understanding of "available to promise" at any moment
	ventory strategy	Small and frequent batches to increase inventory turns	High level of inventory to optimize production efficiency	A single batch per SKU, based on the collection forecast	Inventory just before PDP	Materials / components under a common platform	Low inventory level and inventory pooling
	stomization	No	No	Usually no, but maybe in exceptional cases	Yes, just in PDP and downstream processes	Relevant in manufacturing and downstream processes	Relevant in design and downstream processes
	Asset-utilization rate	High to very high	Very high	High to very high	High before PDP, medium after PDP	Medium to high	Low to medium, in some cases standby capacity for occasional use
	Production cycle	As short as possible to reduce batch sizes	As long as possible to increase batch sizes and efficiency	As short as possible to reduce time from idea to market	Long before PDP, short in PDP and downstream	Variable according to customers' orders accepted in queue	As short as possible to reduce lead time
	Rate (takt) of workload	Smoothed by customer demand	Smoothed by rolling forecast	Smoothed by collection forecast	Smoothed by rolling forecast before PDP, peaks after PDP	Peaks and valleys of high magnitude	Capacity on standby for occasional use, high peaks when used
	Sourcing buffering	Inventory / one supplier for each key component	Inventory / best-cost supplier on each occasion	Pool of suppliers	Inventory / pool of suppliers	Inventory / pool of suppliers	Pool of suppliers for critical resources

*PDP = product decoupling point

[SOURCE: SUPPLY CHAIN ROADMAP, 2013]

RACI Matrix - Sales and Operations Planning Executive Meeting

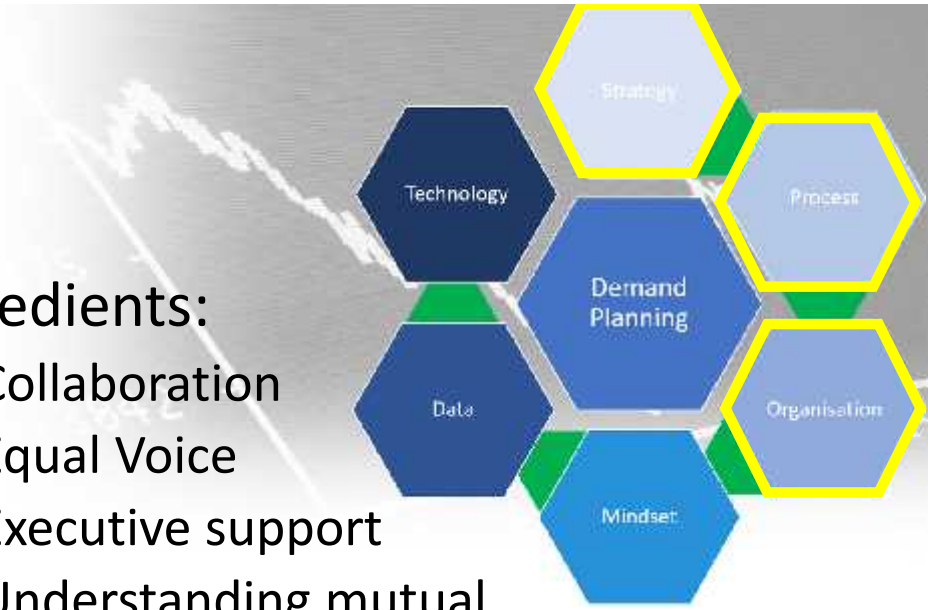
Activities \ Roles	Executive Sponsor	S&OP Owner	SCM Manager	Demand Planner	Inv Planner	BU Director	VP Sales	Head Production	CFO						
Data Gathering															
- Collect Sales History		I	I	A				R	C				R		
- Adjust Outliers													R		
- Update the Sales Indicators	I	I	I	A	I	I	I	I	I	I	I	I	R	I	I
- Prepare the Pre-commercial Meeting								C	C				R		R
Pre-commercial Meeting															
- Conduct the Meeting		R	I	I				C	C				C		
- Take part in a meeting		R						R	R				R		R
- Report Marketing Inputs		I		I					R				A		
- Report Sales Inputs		I	I					R					A		
- Report Inputs Prices		I		I											
- Make the Minutes and send them to interested parties		I	I	I	I	I	I	I	I	I	I	I	I	I	R
Demand planning															
- Analyze Data Collection and Minutes													R		
- Design the next cycle forecast - Statistical and Colaborative		I						C	C			C	R		
- Prepare the Commercial Consensus Meeting		R						C	C				R/A		R
Demand Review Meeting															
- Conduct the Meeting		R	C	C			C	C	C				C		
- Take part in a meeting		R	R	R				R	R				R		R
- Making the Sales Forecast Decision		C	R	R				C	C				C		
-Make the Minutes and send them to interested parties		I	I	I	I	I	I	I	I	I	I	I	I	I	R

Organisation

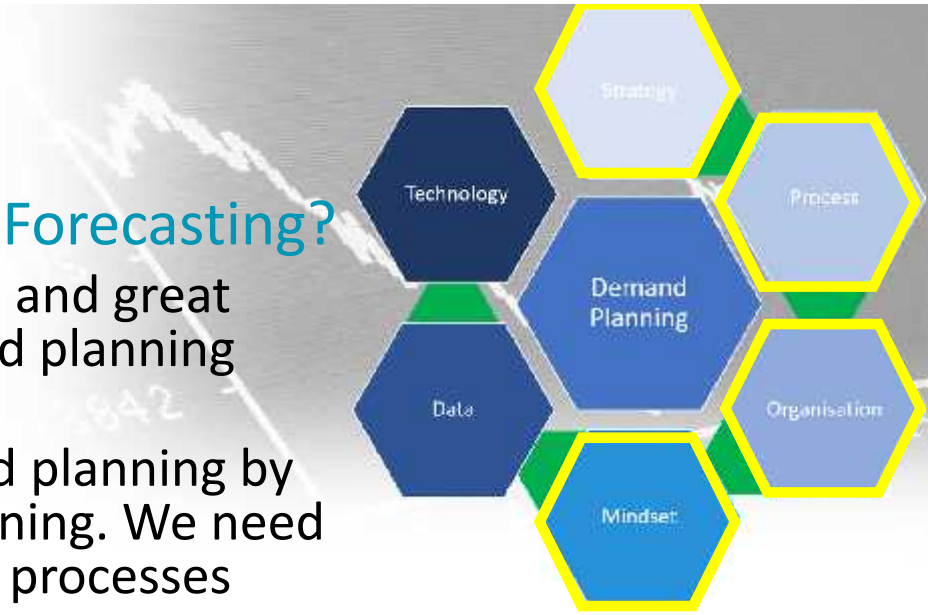
- From Silo Thinking to Consensus Thinking?

Stage 1	Stage 2	Stage 3	Stage 4
Beginning	**Evolving**	**Improving**	**Best Practices**
• Major disconnects between departments (i.e., sales, marketing, finance, operations planning). • Multiple forecasting efforts. • No accountability for forecast accuracy.	• Formal meetings held between sales, marketing, finance and operations planning. • Forecasting isolated to one area, typically in the operations planning area. • "Dominated" consensus forecast meetings. • Performance rewards based only on performance contribution of each individual department.	• Integrated communications between sales, marketing, finance and operations planning. • Recognition that the sales and marketing forecast is an unconstrained demand forecast. • True consensus forecast process with reconciliation between demand, sales/marketing programs and events. • Forecast champion driving continuous improvements. • Performance rewards for all people involved in the consensus forecast process.	• Complete department collaboration and integration. • Integrated collaborative forecasts with customers. • Separate forecasting department reporting to a C-level manager. • Demand forecasting process is completely integrated with the S&OP process matching demand with supply. • Multidimensional performance rewards based on individual performance, as well as corporate performance (KPIs and forecast performance metrics).

- Ingredients:
  - Collaboration
  - Equal Voice
  - Executive support
  - Understanding mutual benefits
  - SC as Orchestrator
  - Technology
  - Mindset



Mindset



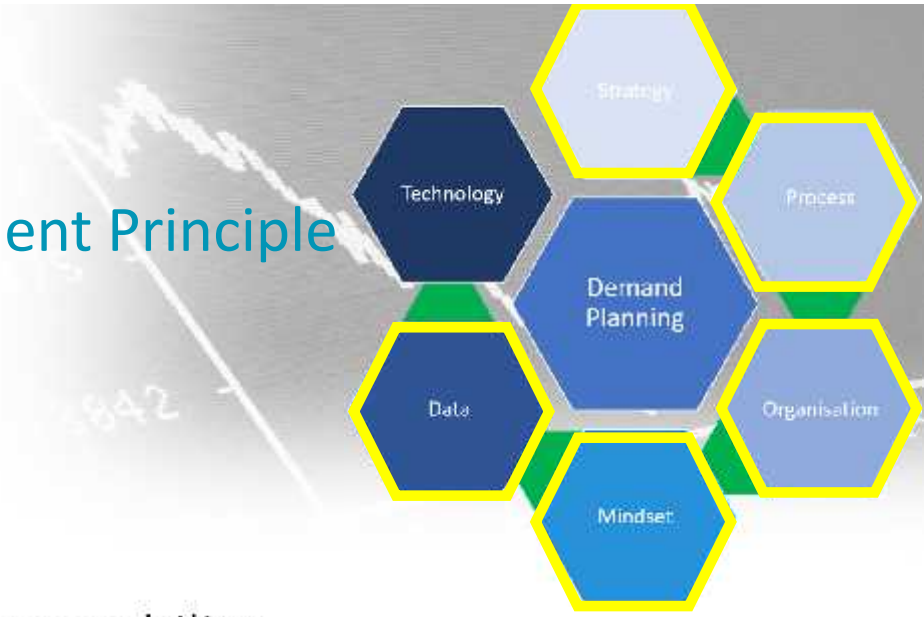
- Who is the owner of Demand Planning and Forecasting?
  - We can have the best analytics, a solid process, and great collaboration - and still do a poor job of demand planning Why?
  - Because the processes and practices of demand planning by themselves won't necessarily improve our planning. We need to also have a proper mindset to support these processes
  - Who is responsible, accountable, consulted, informed (RACI as result of your Supply Chain Process Framework)
  - **At the end all stakeholders owns the forecast. And everyone who sees anything that might impact what the company needs to produce or distribute needs to understand that it is important to communicate this**
  - **Integrate this in you communications and reporting lines**

Data

- The more we understand the data, the better it is
  - Make sure that all your data is correct, reliable and consistent
  - Understand your data:
    - How much data do we need?
    - Which data are more appropriate: aggregated or disaggregated?
    - Is there a missing data value?
    - Are there outliers in the data
    - Is there a structural change in your data?
    - In which lifecycle phase is the product?
    - …
  - Play with your data before the demand planning process
    - Customer/Product/Supplier/Market/or combinations
    - Example: Product Portfolio Management Principle
      - Value to the company
      - Forecastability

Data

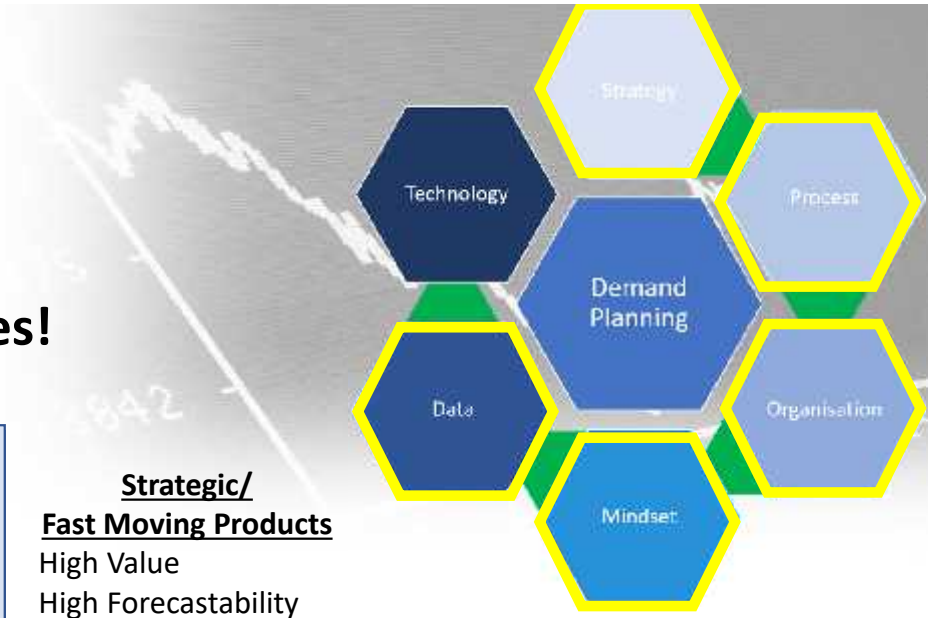
- Example: Product Portfolio Management Principle
  - Value to the company
  - Forecastability



AA	AB	AC
BA	BB	BC
CA	CB	CB

1. Low value, low forecastability,
2. Low value, high forecastability,
3. High value, low forecastability,
4. High value, high forecastability

Data



Different Forecast Models and Types!

Risk/New Products
High Value
Low Forecastability

Slow Moving Products
Low Value
Low Forecastability

-Structured Judgement • Data Mining, Clustering, Time Series Models **-Sales Forecast Composites** **-Independent Judgement** **-Delphi** **-Industry Specific**	**-ARIMAX** **-Multiple Linear Regression** **-Dynamic Regression** **-Exponential Smoothing** **-Industry Specific**
-Weighted Combined Models • Judgement, Time Series Models, Causal **-Moving Averaging** **-Crostons Intermittent Demand** **-Industry Specific**	**-ARIMA** **-Decomposition** **-Exponential Smoothing** • Multiplicative • Additive • Linear Damped Trend **- Industry Specific**

Company Value

Forecastability

Strategic/ Fast Moving Products
High Value
High Forecastability

Flow/Mature Products
Low Value
High Forecastability

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Marketing Analytics and Forecasting

Technology

- What are the requirements in relation with technology
  - Different forecast techniques
  - Expert Selection
  - Data and Supply Chain Analysis
  - Aggregation and Disaggregation
  - Dashboarding and Reporting
  - Management by Exception
  - Segmentation
  - User Friendly
  - Easy to implement
  - Generic
  - Cloud Solution

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QUESTIONS & ANSWERS

Contact Information