Dynamic Segmentation

Driving Customer-Centric Supply Chains

BlueYonder
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Idea in Brief

The Challenge:

The changes in market dynamics are going faster than the ability of organizations to change strategies. Key reason is that the definition of segments and its strategies are very tedious and performed too infrequently. This translates into loss of market share, excess inventory or high cost to serve.

The Remedy:

A SaaS subscription that chooses the right segmentation attributes automatically builds up the segments and feeds the policies back into the planning system for execution. As a result, the planning system always executes to capture the best of the economical changes.

The Results:

6-10% reduction of stock value based on customer testimony. Significant impact on on all KPIs.

Defining a segmented planning strategy for different products, customers and locations is not a new idea. What's new is the concept of dynamic segmentation, in which these fast-moving and ever-changing segments are continuously updated.

Given today's volatile business environment, dynamic segmentation can add incredible value to the planning process. By reviewing segments and the criteria that define them on an ongoing basis, companies can balance service level, cost to serve and cash to serve as conditions inevitably change.

This Blue Yonder white paper takes a closer look at dynamic segmentation and the new value it can deliver for just about every organization.

First, the basics: Why do you need segmentation?

One of the most obvious examples of segmentation, and one that's easy to understand, is airfare pricing. For years, budget-conscious travelers have worked hard to decipher the sophisticated models by which major airlines segment their customers. While no one seems to have succeeded, the fact remains zthat people sitting in adjacent seats, on the same flight, have quite possibly paid significantly different fares for those seats. The criteria for the difference remains murky, but involves the timing of the booking, the frequency of travel, customer loyalty points, the amount of checked baggage and other factors.

Whatever the segmentation criteria working behind the scenes, each traveler, in the end, achieves a satisfying flight experience at a price level they believe to represent a fair value.

In turn, airlines are able to balance profitability with capacity utilization. They may charge lower ticket prices as the flight time approaches, but they are maximizing the value of their physical assets (the plane and its fuel) and human assets (the flight and ground crews).

While it may not be as obvious, many any other businesses can benefit from effective segmentation. In order to grow, increase their market share and generate more value from their fixed investments, companies can offer different service models, based on a variety of criteria. The adjustment variables for these models include service levels, prices, promotional offers, delivery times, delivery frequencies, emergency response mechanisms and product customization. But they are all based on intelligently balancing service with cash and cost to serve.

These services models have a profound impact on decisions made across the value chain. From stock coverage and stock positioning to sales forecasting, consensual planning, arbitrations and tradeoffs, order promising, promotions and emergency resolutions, an end-to-end segmentation strategy drives smart, profitable decision making.

Maybe one day, each unique product-location will have its own service model, a segment of one. Until then, segmentation consists of defining how service models provide a competitive advantage, as well as defining which product, customer, or channel belongs to which service model.

Over the past ten years, companies have developed more segments than before, a trend that accelerated in the extreme volatility of 2020. In the retail world, for example, the closure of brick-and-mortar stores shifted huge purchasing volumes from the traditional store model to the internet model. To further complicate matters, many existing stores were forced to focus more on an omni-channel model. They acted as mini distribution centers to fulfill online orders, while also shifting their own merchandise to other stores. While these models have been prototyped during the COVID-19 pandemic, it's hard to predict if they will remain sustainable once the crisis is over. There's no way to tell, but this new, shifting definition of retail channels is likely to have an impact on segmentation in the future retail space.

In every industry, the pandemic has only served to reinforce the financial logic that underlies segmentation: Under conditions of limited funding or product scarcity, what is the best equation to optimize growth and generate value? The answer lies in defining differentiated service models, including pricing, that help to increase market share and support growth, even in the face of uncertainty and reduced investments.

COVID-19 also reinforced the need for dynamic segmentation, as conditions changed daily in some regions or industry segments.

Implementation: key challenges

Implementing an segmentation strategy is challenging for a number of reasons. Chief among the challenges is the sheer volume of data that organizations must consider. Based on this data volume and its complexity, companies typically create a large number of segments to reflect the diversity of different customers, products, delivery paths and selling channels.

On average, many manufacturers begin by defining between five to eight segments. This might sound manageable. But the difficulty quickly becomes defining the population of product-location-channel variations for each segment. For example, in manufacturing industries, segment populations can range up to 400,000 SKUs, while retailers can approach 10 million SKUs. Whatever business they are in, companies can quickly become overwhelmed. The data ingestion needs alone are enormous.

The key to tackling this challenge is ensuring that the right strategy is used to define meaningful segment attributes. Factors such as volume, price, cost, order quantity, intervals between orders, coefficient of variability and order lead time are standard attributes. Some attributes might be correlated. Others may or may not add value to the segmentation. Others might have a spurious relationship. Some attributes might be theoretically relevant, but statistically irrelevant to segmentation. These distinctions are not always obvious.

The limitations of manual segmentation processes

Given this complexity, it's easy to understand why manual segmentation can quickly become a very tedious and time-consuming exercise. Increasing the attributes also leads to complexity. It can take the typical company an average of three weeks to choose attributes, analyze the new distributions, come up with bands and combine these bands in a multidimensional matrix. For example, the resulting matrix could reflect a "segment A" defined by high margin, medium volume, and low variability. Segment Z might be defined by low volume, low margin, and high variability. These matrixes can become complex very quickly.

During crisis, some organizations deprioritize segmentation because it takes too long and market dynamics are changing too fast.

The fact is, segmentation is never more valuable than when conditions are fast-changing. Organizations that can pivot and respond more quickly than their competitors will usually emerge as winners.

Manual segmentation is simply not a viable solution, especially in today's complex and volatile business landscape. The human brain can dynamically process populations with only a limited number of attributes. But humans are simply not capable of considering order lead time, price, variability and seemingly countless other factors that affect the service-profitability equation. If humans manage the segmentation process manually and attempt to combine all these factors into a matrix, it's almost certain that valuable time will be consumed and the suboptimal segment populations will result.

Capitalizing on machine learning to automate segmentation

Fortunately, machine learning offers a time- and cost-effective solution for the complex mathematical problems that underlie dynamic segmentation. Machine learning is adept at analyzing large volumes of data and helping planners confidently and accurately answer critical questions such as:

- What attributes should we use to define segments?
- How important are these attributes?
- How many segments should we define?
- What are the segments, what are their definitions and how frequently should they be revisited?

The machine learning approach also offers additional benefits, including:

- Automation of strategic & tactical segmentation, supported by unsupervised learning
- Interpretation to ensure that adoption is enabled and supervised by advanced technology
- The ability to simulate segments, which enable supply chain experts to run simulations and add their own intelligence
- The ability to alert decision makers about 'data drifts' reflecting market dynamic changes & the ability to shift from tactical to strategic segmentation
- The ability to define not only segments, but to allocate segment-specific policies such as customer service levels, allocation and promising policies, and short-term resolution rules

By leveraging machine learning along with the expertise of their human planners, organizations can achieve a unique combination of artificial intelligence and human intelligence. This represents a significant competitive advantage as conditions change and segmentation is managed dynamically.

How dynamic segmentation advances planning maturity and improves results

Today, only a few companies have truly optimized their segmentation; most have yet to discover the full value that mature segmentation approaches can provide. This is partly due to the analytical expertise and sheer quantity of work required by dynamic segmentation. It's also due to delays caused by the COVID-19 pandemic, as many organizations focus on short-term emergencies and put long-term strategic initiatives on the back burner (see sidebar, "Planning in a Pandemic").

However, as dynamic segmentation offers a time- and cost-effective, automated approach that eliminates tedious manual work, there is a huge opportunity for companies to increase their focus on agile planning.

Machine learning enables them to leapfrog the planning maturity curve and realize substantial benefits in a short time.

What is meant by "planning maturity"? This phrase simply recognizes that some companies have a very basic approach to segmented planning, while others are more sophisticated. "For example, they may be using Excel to to support a yearly or bi-yearly segmentation process. Blue Yonder clients who have been using Blue Yonder Inventory Optimization with segmentation capabilities have been able to make significant progress in their maturity journey. Now with the rapid pace of change, the need for greater resiliency, and the availability of machine learning innovations, many companies can benefit from the latest innovations.

Planning in a Pandemic: Dynamic Segmentation Can Help

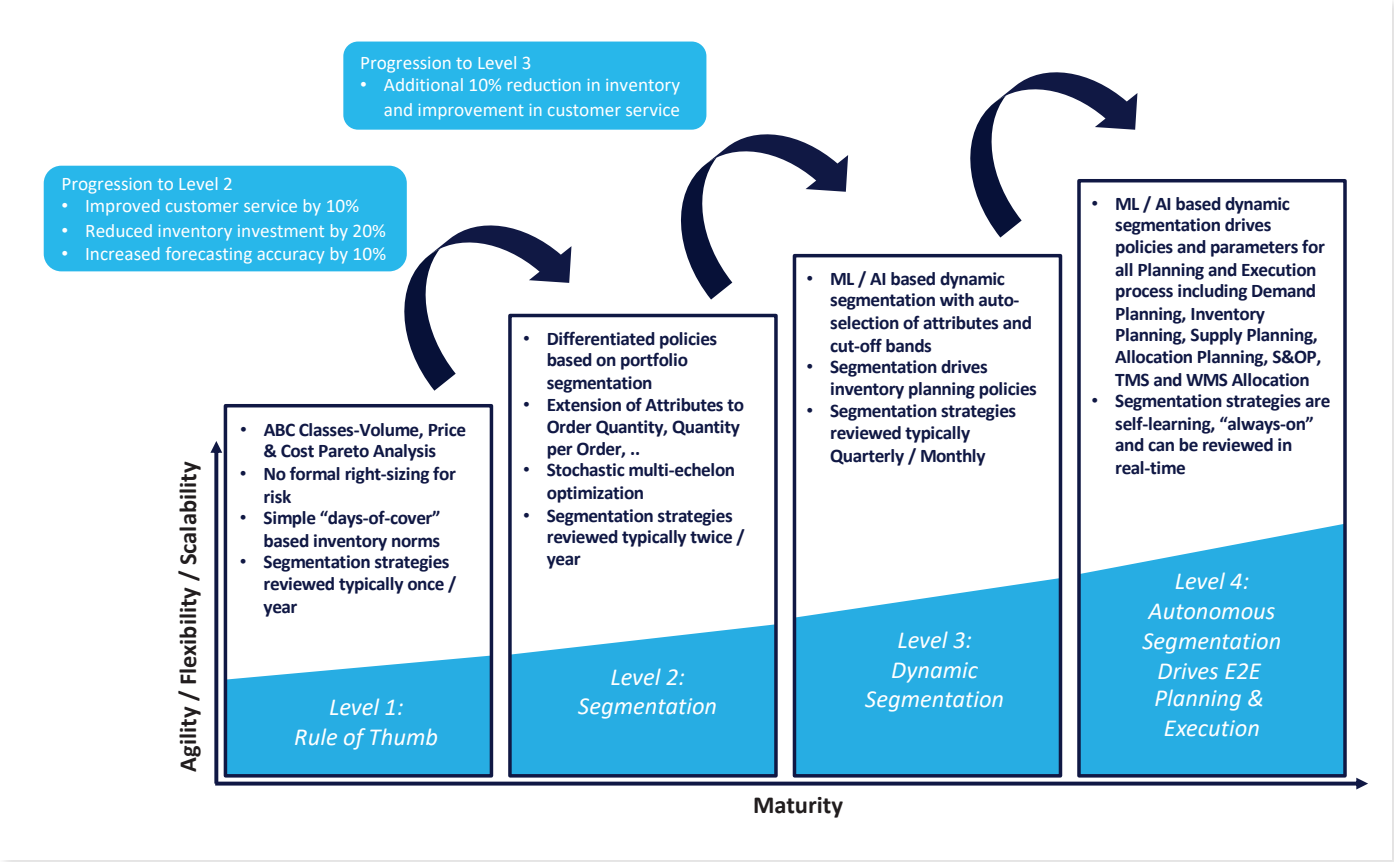
The impact of COVID-19 may be distracting companies from long-term initiatives like dynamic segmentation. But the fact is, today's volatility only increases the value of dynamic segmentation, making it a priority.

Changing markets imply consumption changes; SKUs may move from one segment to another, cut-offs between segments may change, attributes may become obsolete and new decision factors may emerge. The habits of relatively stable segments may be dramatically altered. This only emphasizes the need for constant reevaluation of segments.

Dynamic segmentation also has great potential to improve the productivity of overwhelmed planners via automation.

Here are some examples of different maturity levels:

- At a European aftermarket business, the service level had been set to the highest possible range (97-99%) across all products, based on a historic rule of thumb. This is a low level of maturity that failed to recognize the differences among slow-moving and fast-moving SKUs. The company partnered with Blue Yonder to address this issue and improve planning maturity.
- A global medical system is using volume and price to segment its product line, but 13% of its products are shelf-life and temperature sensitive. Blue Yonder is helping to eliminate a large amount of waste and expediting by setting up safety-stock policies for extended segments that reflect both shelf-life and temperature-control attributes.
- A US Tier 1 automotive manufacturer runs segmentation based on volume, revenue and margin. But its segments haven't been adjusted since December 2019, because planners have been overloaded with disruptions related to COVID-19. Blue Yonder is supporting the company in realizing the benefits of dynamic segmentation in this kind of volatile market.
- As an example of a company that has realized incredible value and achieved planning maturity, Mahindra & Mahindra a $20 billion Indian automotive company reduced its inventory stock by up to 10% by coupling dynamic segmentation with an inventory optimization solution.
- As a second step in the journey, Mahindra & Mahindra drives decisions based on risk exposure by integrating supplier lead time and supplier variability as segmentation attributes.



Achieving Level 4 maturity is now possible

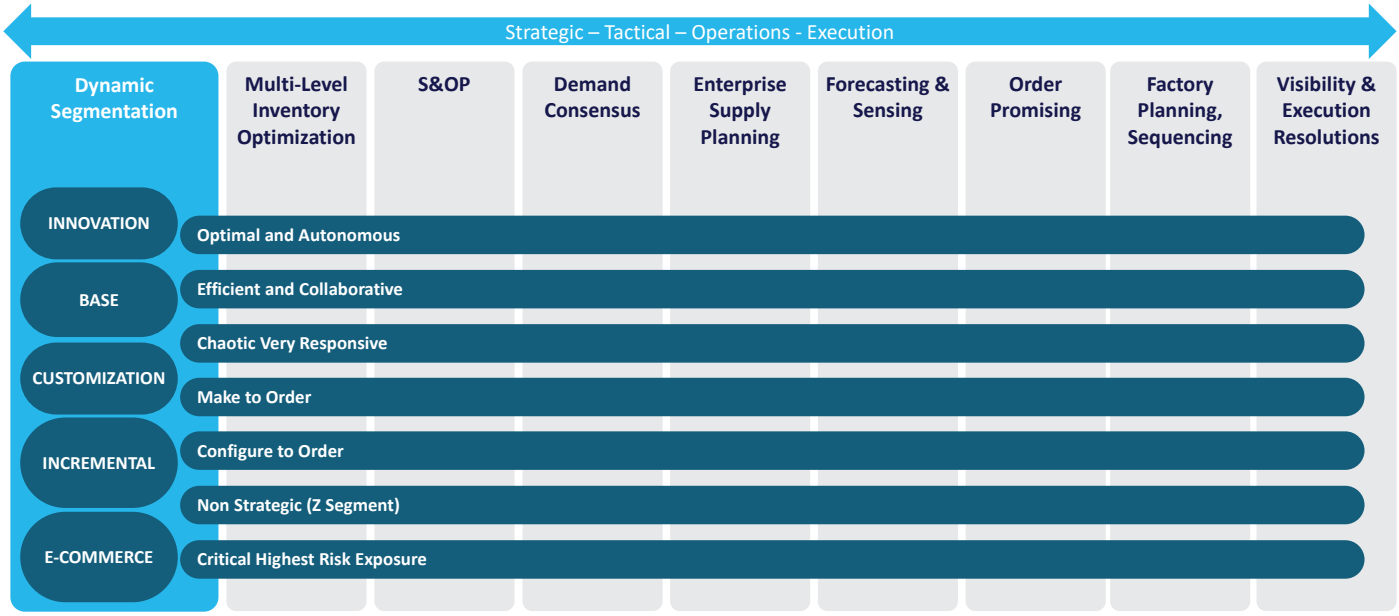
The figure above illustrates the four levels of segmentation maturity.

Dynamic segmentation leap frogs the maturity level by eliminating the hand holding and errors made by humans. A company in level 1 maturity could directly jump to level 3.

At Level 4, automated segmentation enables companies to continuously align and re-align their planning processes around key segments, in real-time, as conditions change.

Until recently, Level 4 was considered the "Holy Grail" of segmentation and considered practically impossible to attain. However, the dynamic segmentation capability in Luminate Planning solutions from Blue Yonder can now drive custom-tailored planning policies in promising, inventory planning, supply planning, allocation and distribution to ensure there is a perfect alignment of decisions across the organization and the broader supply network.

Blue Yonder Translates the Market Dynamic Changes into End to End and Segmented Planning & Execution.



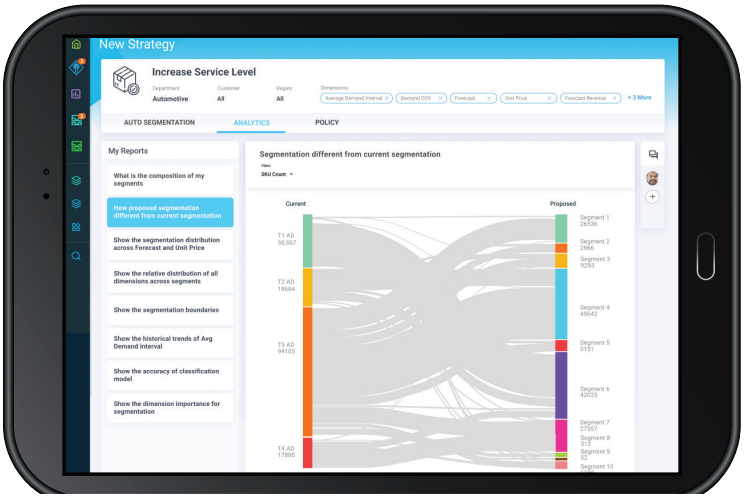
Dynamic Segmentation is part of the Luminate Planning solution suite. By design, users with Blue Yonder solutions can take full advantage of the additive capabilities of Dynamic Segmentation. For example:

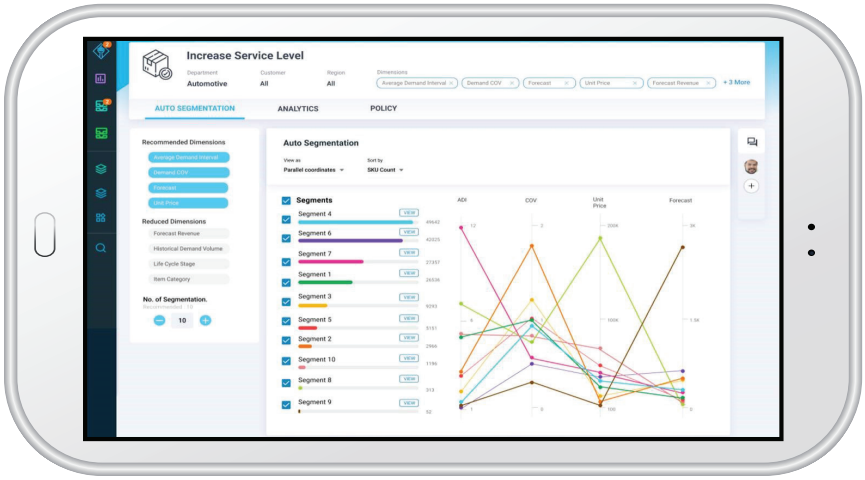
- Blue Yonder Inventory Optimization can leverage recommended Segments and Service Levels from Dynamic Segmentation
- Blue Yonder ESP can leverage recommended Channel Priorities and Layers
- Order Promising can leverage Channel Hierarchy and Promising Policy
- Fulfillment can leverage strategies such as Direct Ship, Vendor Managed Inventory, Less Than Truckload (LTL) and Full Truckload (FTL) and Expedite
- Blue Yonder Demand and S&OP attributes can be used to drive planner efficiency (statistical forecasting, POS based, collaboration, and more).

Fueled by machine learning, Blue Yonder capabilities enable "by design" the configuration of dynamic rules to enable segmented, highly mature planning. Via continuous dynamic segmentation, diverse segments can be mapped to strategies and feed rules in Blue Yonder's Luminate Planning. The figure below shows how a typical organization might segment its business to balance high service with high profit margins by implementing appropriate policies in Luminate Planning. While segmentation changes can be automated & executed, organization should simulate the impact of changes (ex: what is the impact of the inventory budget?) Luminate Planning enables what-if simulations to validate & accelerate decisions.

How Luminate Planning enables different segmentation strategies

- Supply Chains need to be equipped with fast response planning capabilities to react against high volatility segments. Planners can create scenarios, increase stock level, simulate promotions, expedite logistics or increase overtime capacity, but fast response can become expensive when considering efficiency, cost to serve & cash to serve. For high priority customers and high value products, fast response planning should be priority.
- High volatility for lower priority customer and lower margin should be treated as non-strategic 'Z-segment', where the cost to serve & cash to serve is minimized (ex: for low CSL, we would not authorize overtime, build ahead or expedite to meet).
- For a scenario with stable volume and low supplier variability, there's an opportunity to be highly efficient with planners, capacity utilization and logistics. This is the perfect case for a planning optimization technique.
- Other common segments are: Collaborative & Optimal, Configure To Order, Make To Order, and Innovation





All segments are not created equal

Today, we've come to realize that not all products, customers or channels are equal. They are not interchangeable. Each demands different levels of services and contributes different levels of value to the business.

In the past, it was challenging to develop, maintain and update customized policies for diverse segments that balanced service with profit. But now dynamic segmentation, powered by machine learning, provides a straightforward, highly automated, time- and cost-efficient means of accomplishing this. Not only can organizations constantly monitor segments and their associated policies in real-time, but these policies can be autonomously updated, freeing up human planners for more strategic work.

The COVID-19 pandemic is only the most recent disruption for the world's supply chains, and there are sure to be others in the future. Dynamic segmentation ensures that companies remain agile and resilient in the face of these disruptions, making it a critical competency for virtually every business.

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