



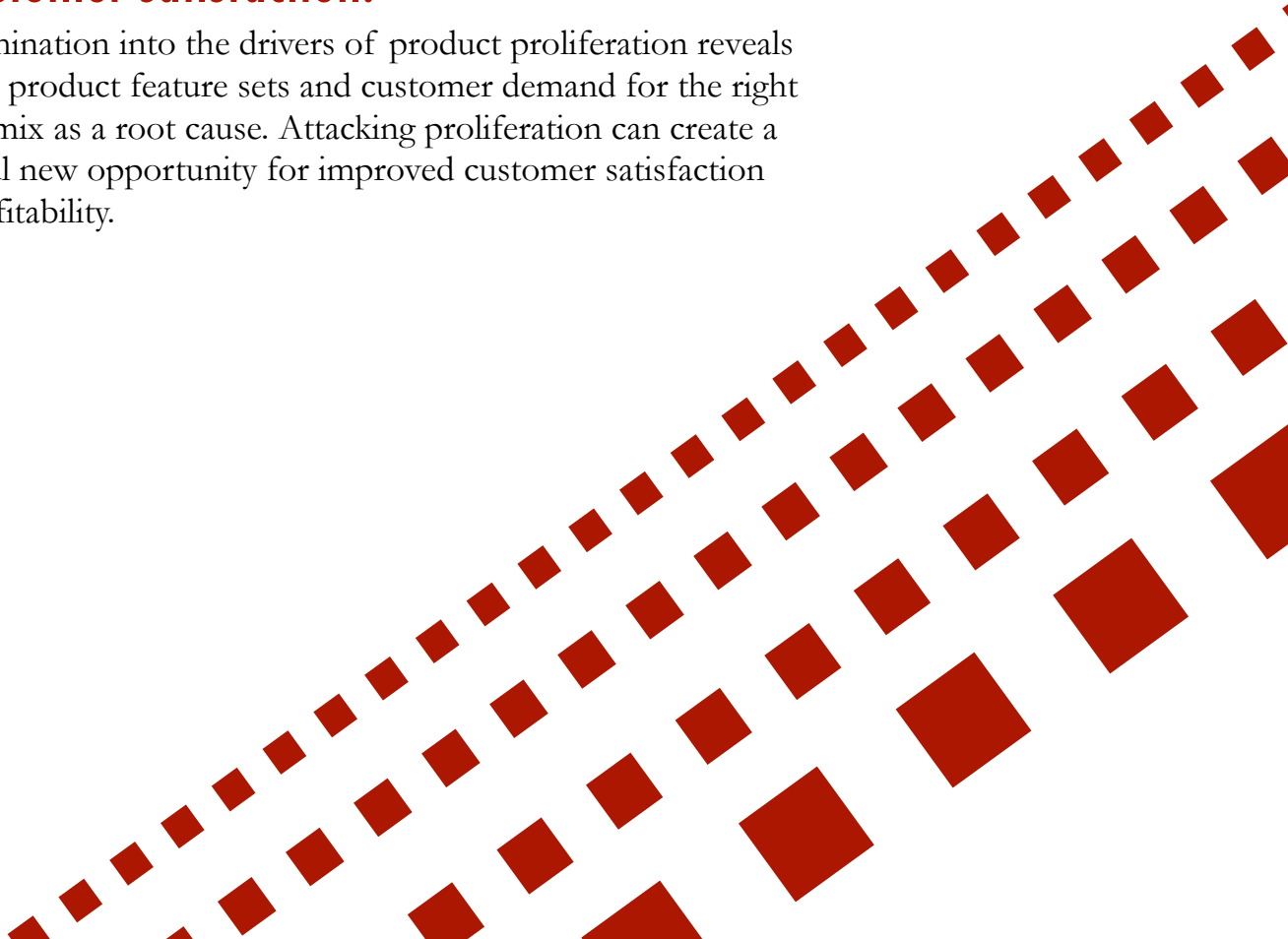
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FROM ANALYTICS TO ACTION

Product feature mix: key driver of product proliferation and key to higher margins

Companies wrestle with unrelenting pressure to manage product proliferation and its impact on customer satisfaction.

An examination into the drivers of product proliferation reveals growing product feature sets and customer demand for the right feature mix as a root cause. Attacking proliferation can create a powerful new opportunity for improved customer satisfaction and profitability.



Fixed products have virtually disappeared in favor of configurable products, where customers can mix and match different product features and options. The number of feature choices for a product drives the number of configurations required to meet customer demand. Customer expectations about availability and selection are high. This causes companies to offer a large number of product configurations, creating product proliferation. Unfortunately, product proliferation creates customer confusion and complexity in every business unit, inflating costs and squeezing margins. A company's sustainable profit hinges on providing the right product mix to satisfy customers at the highest margins.

Understanding feature mix as a driver of proliferation

A simple product may have 5 optional features and only 4 variations of each feature. This simple product still leaves manufacturers with over 1,000 product variants – all of which likely have design and process implications. Every time a company adds additional configurations or a new feature to a product, they must also deal with the following challenges:

- Additional engineering and/or prove-out time
- Challenges in product availability and service due to channel inventory buildup
- Customer confusion due to growing choices
- Increase in demand forecast errors
- Burden to support and maintain all configurations
- Margin deterioration due to additional cost burden

To compound the problem, real markets demonstrate highly variable demand patterns. Mismatches between customer desires and the products being built and offered are frequent. After companies navigate the design and process challenges related to offering more features and options, they run the significant risk of not producing the right mix of features and options to meet the current demand wave. Companies face these and other critical demand-oriented problems:

- Configurable products drive customers to order a very wide range of variants, creating supply challenges.
- Continuous product changes create fractures in demand history because it is difficult to track demand for product offerings that change frequently over a short period of time.
- Forecasting aggregate volume, with no configuration detail, adds to the challenge.
- Finished goods inventory deadens and distorts true demand signals. Industries that must anticipate demand due to seasonality and lead-time pressure find mismatched finished goods building up in channel inventory.

Based on real implementations, our research shows that product proliferation can erode margins by 18 to 25 percent and is the root cause of all complexity within an organization. It is clear that managing product proliferation in light of margin pressure and customer service is a mandate. Done well, it could become a game-changing competitive capability for a company.

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Steps for harnessing product proliferation

Companies can use the following game plan to manage product proliferation and enjoy a considerable competitive advantage over companies that allow product proliferation to manage them.

1. Hear the market

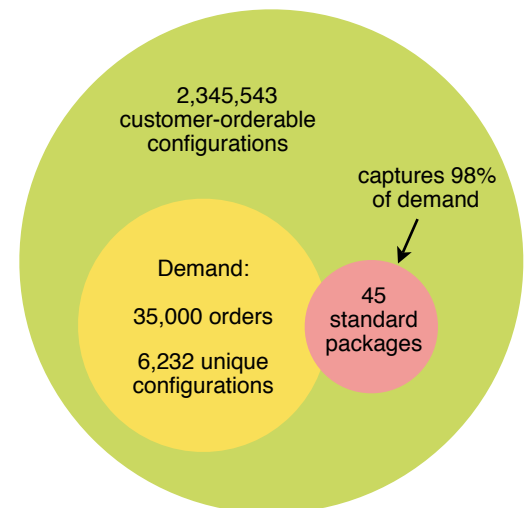
Today, many companies are feeling the pressures of product availability and mass customization. As they respond to these pressures, companies must move beyond simple aggregate forecasts or historical projections that have constituted the bulk of demand management in the past. Now companies must recognize essential demand signals – especially for features and feature groups that are high value. **Hearing the market** means understanding the features and feature mix that customers are buying. How are customers configuring the product? What are the feature mix trends?

Product planning strategists must now look at improving the quality of their true demand insight. Today's sophisticated forecasting systems are used to forecast at the aggregate level, with little or no visibility into the feature and option level of product configurations. This lack of visibility and understanding is a key driver in product proliferation and the resulting cost inflation throughout the supply chain.

When companies are able to visualize feature-level demand, they see the source of their product proliferation. Companies cannot begin to manage demand unless they understand their product offerings through the eyes of their customers and the ways in which customers configure their products. Consider the following real-life example of the characteristics of configured products:

- **Customer-orderable configurations** comprise the universe of all possible configurations that a customer can order for a product – the number of ways a customer can mix and match features and options. Most companies are surprised at the true number they wrestle with. For example, an automobile with 27 features and 67 orderable options results in over 2 million customer-orderable configurations. As the number of orderable configurations increases, companies experience a corresponding degradation in customer service, challenges in forecasting and an increase in complexity in every business unit.

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- **Demand** tells us that the company processed over 35,000 orders for 6,232 unique configurations – a far cry from the over 2 million configurations offered that the manufacturing and supply chain staff has organized for and procured to satisfy. Given the freedom to mix and match features and options, customers may order a very different set of configurations year over year. This configuration volatility is the primary cause of growing forecasting errors in every business unit.
- **Standard packages** tell us that (in this case) there is an opportunity for just 45 standardized, optimal configurations (standard packages) to fill approximately 98% of customer orders with some adjustment to the feature mix. These 45 standard packages will have improved product availability and customer service as well as higher margins due to higher accuracy in forecasting.

2. Understand feature mix popularity to shape demand

Simply put, companies can **shape demand** by adjusting product feature mix to maximize order fulfillment with the smallest number of product configurations. Continuous monitoring of demand patterns at the feature and option level makes it possible to compress the number of configuration possibilities and reduce product complexity.

Identifying the optimal number of core configurations will increase the customer match rate at order time and reduce the number of variants that the supply chain must anticipate and manage. To minimize one-off requests, companies must have the ability to immediately know if the current product offering can satisfy a customer request. If not, they must know how far off the feature mix request is. Can it be satisfied with a few changes that do not significantly impact the delivery cost, or does the request require a significant change to the current configuration of a core offering? Given this knowledge, the company can continuously assess how it is differentiating its core product offering along service lines, configurations and price structures. If a large number of customers is requesting the same feature and option set(s), the company can evaluate the potential return on adding another service level, configuration and price structure to the product offering.

To truly shape demand, a company must be able to recognize exceptions to its differentiated product offering so that it can provide accurate availability and service level estimates to the sales force. If all customer requests are equal in priority, the cost of servicing is extremely high. When sales can immediately explain to the customer that they can have what they want but that it will take 90 days and cost X dollars more, then that opens the door for the customer to evaluate whether the current product offering or a less substantial (and costly) modification to the product offering will meet their needs. Many customers will choose an available configuration that is close enough when faced with extra wait time and expense. If the customer still wants the one-off configuration, the company gets the benefit of assigning the appropriate priority to the configuration rather than bombarding the supply chain with constant exceptions, hampering delivery and service for all configurations. This one-off configuration now presents an opportunity for a higher margin and service level, as opposed to creating poor margin and losing customer goodwill.

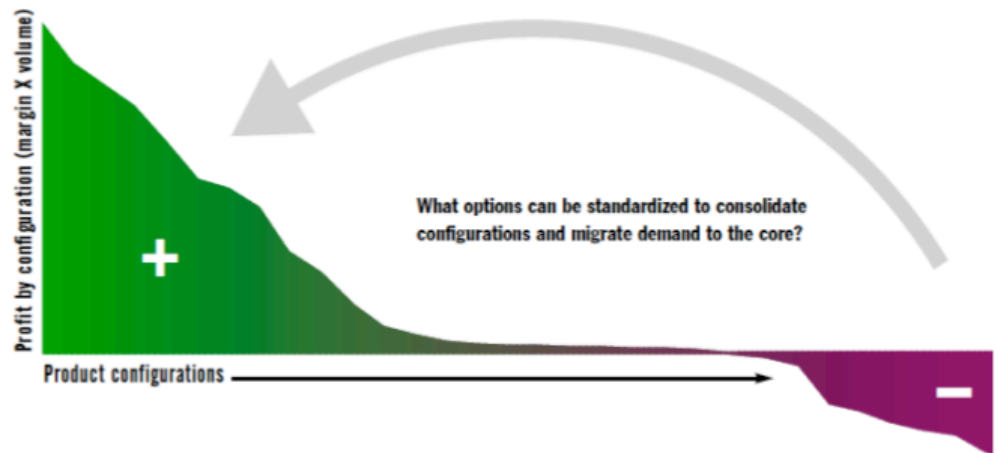
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Getting to the source of product proliferation and complexity is essential to making effective demand-shaping decisions. This includes all of the following tasks:

- Monitor popular features, feature groups and trends in customer demand.
- Recognize your product offering and understand all feature and option combinations available to a customer to order.
- Identify opportunities to provide the best customer value at the highest margin.
- Identify low-volume and one-of-a-kind configurations that become exceptions in the delivery process or drive up cost through unique materials and process complexity. These low-volume configurations, once identified, can sometimes be absorbed by more comprehensive, high-volume configurations.
- Measure the opportunities of demand-shaping strategies like option bundling, free or discounted upgrades, and late-stage customization to alter the product mix presented to the customer. Understanding the economic impact of each will have a profound impact on product margins.

Getting to the source of product proliferation entails identifying opportunities to provide the best customer product value at the highest margin.



3. Maximize customer satisfaction

Most product planning systems today are based on historical trends and extrapolations at a macro level. The macro level may be aggregate product demand or at best the model level. These systems typically do not recognize customer demand for feature mix. At most companies, the feature mix forecast is typically done using spreadsheets. Due to complexity and size, current methods fail to solve this problem, resulting in product proliferation, reduced customer service and profit loss.

Solving the product mix problem before it is introduced into the supply chain is essential to improving customer satisfaction and sustainable profit. By optimizing the product feature mix to match demand, companies can reduce configuration volatility and minimize servicing low-margin, one-of-a-kind variants. Both of these outcomes increase the effective use of capital assets.



Due to the magnitude of the negative impact of growing product proliferation on profit, over 90% of Fortune 500 companies have recognized this among their top 5 strategic initiatives.

The impact of managing product mix is felt in the following ways:

- Optimal core configurations with the right feature mix can shape customer demand for a higher order match rate. A higher match rate implies that more orders are being captured by the optimal core configurations. Hence, more of the company assets get applied to servicing profit-delivering orders.
- Less variability and volatility in production plans result in reduced just-in-case inventory. Likewise, the optimized standard packages allow the company to make an economic decision between BTO (build-to-order) and BTS (build-to-stock), customer lead time and service levels.
- Continual monitoring of demand enables product planners to quickly identify a divergence between forecast and actual feature mix due to changing customer preferences; marketing promotions can be acted upon before inventory buildup occurs.

The reward: optimizing product feature mix maximizes customer satisfaction and profit

Clearly, companies must present configurable products to meet customer demand and differentiate their offerings from those of competitors. Once a product becomes configurable, new versions proliferate as marketing and engineering staffs try to satisfy all customer requests and product extensions. Proliferated products cause poor customer experience and complexity in every operation of the organization. Due to the magnitude of the negative impact of growing product proliferation on profit, over 90% of Fortune 500 companies have recognized this among their top 5 strategic initiatives.

Based on years of advanced research into customer demand at the feature mix level, Emcien offers a sustainable solution, EmcienMix™, to harness product proliferation. EmcienMix's predictive analytics provide visibility into customer buying patterns and trends, determining which feature combinations are selling and which are profitable. The solution forecasts demand at the feature and option level as customer preferences change, and then delivers actionable steps companies can follow to optimize their product mix and increase margins.

About Emcien, Inc.

Emcien is an Atlanta, GA-based software firm that solves complexity problems for discrete manufacturing companies. EmcienMix is a unique software solution that optimizes product mix to maximize profits, all while aligning closely with customer demand. Customers include Fortune 500 companies and manufacturers in the electronics, automotive and industrial sectors. Emcien was named a 2008 Cool Vendor in SCM and ERP by Gartner, Inc. To learn more, call 404-961-6360 or visit www.emcien.com.
