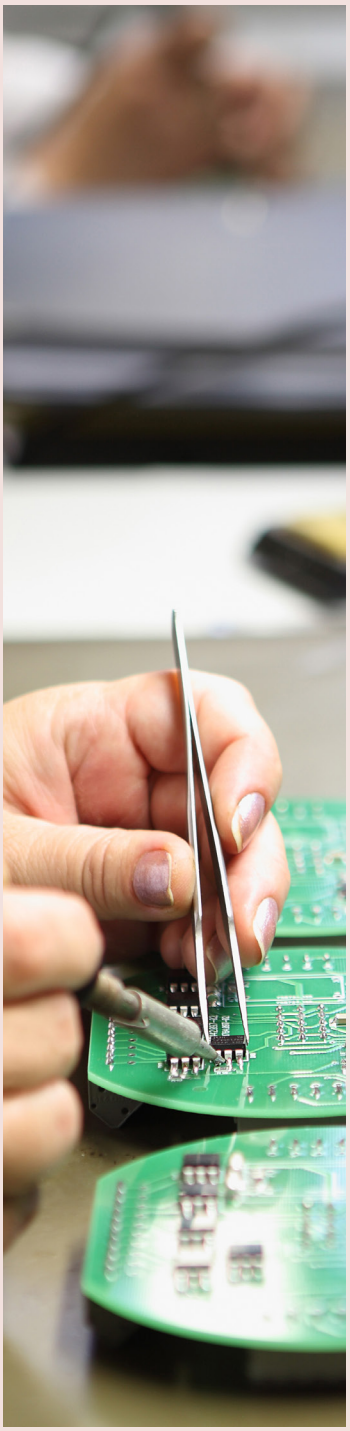
CASE STUDY



REDUCING FINISHED GOODS INVENTORY (FGI) FOR A LEADING ELECTRONICS DISTRIBUTOR THROUGH ANALYTICS-BASED DEMAND ASSESSMENT AND INVENTORY CLASSIFICATION

Abstract

How Infosys BPM Analytics, with a combination of analytical rigor and cutting-edge visualization assisted a world leader in electronic components distribution in optimizing its FGI inventory holdings and honing its strategy to improve customer service levels.

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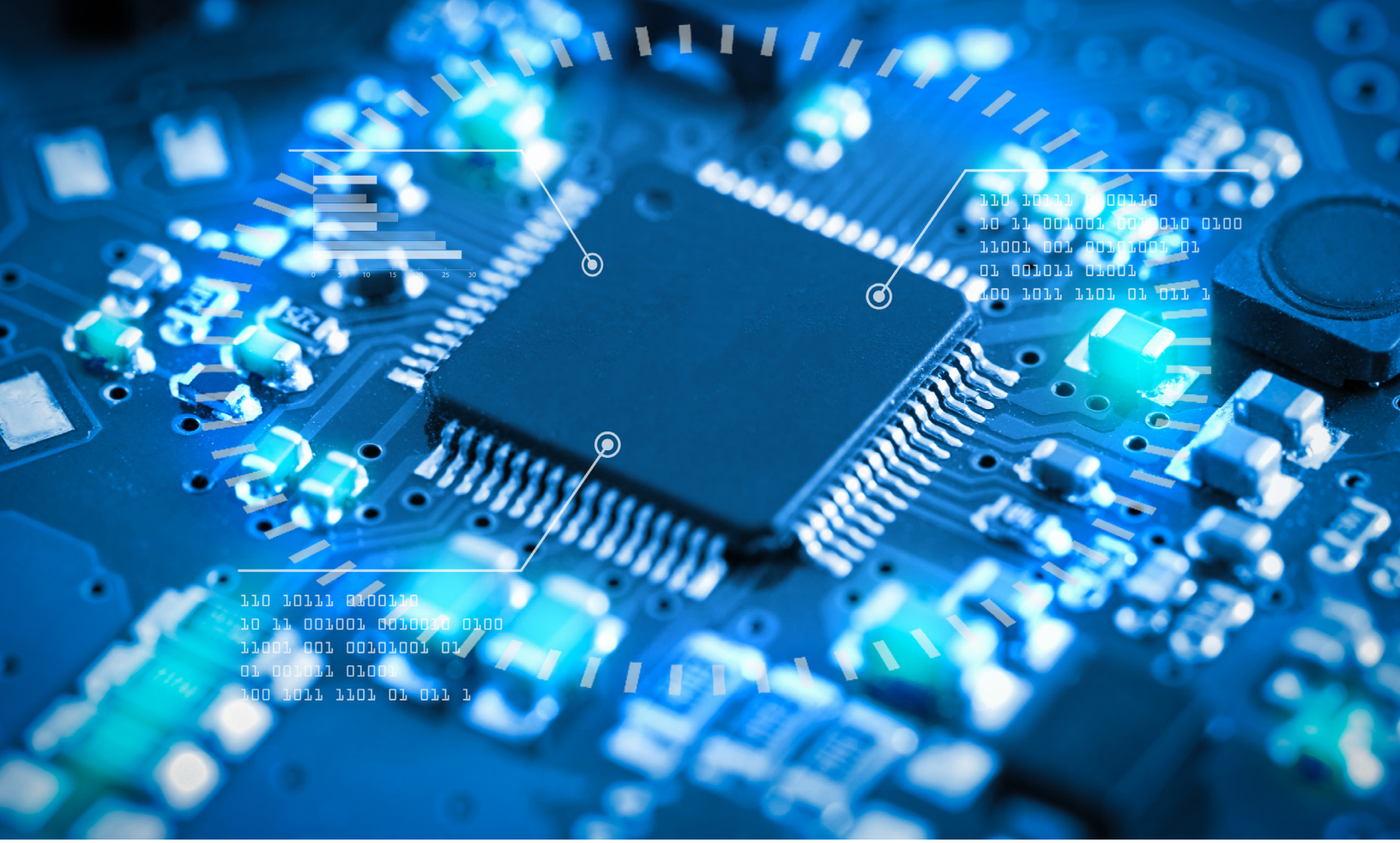


Mechanics of the electronic components distribution value chain

The electronic components distribution business is highly competitive and complex – it is characterized by margins frequently in low single digits, partner-mandated inventory levels and supplier clout. Other challenges include a "long tail" with a typically large SKU portfolio, whose demand is difficult to forecast both in terms of quantity and timing. To win in this game, companies need to focus on customer service levels - to be able to offer a vast selection of readily available products to customers with compressed delivery schedules.

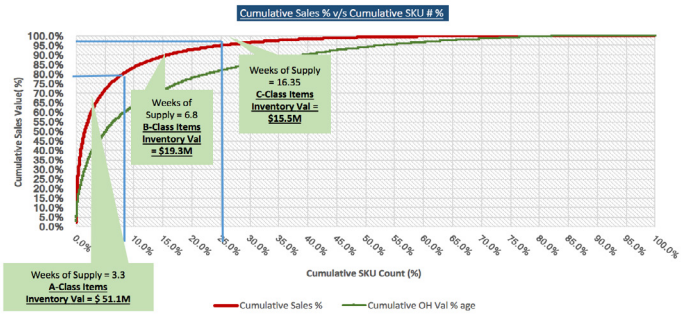
In this kind of a scenario, the component planning teams strive for an effective demand-supply match, considering a host of variables including demand volatility, supply disruptions, and the perennial struggle to balance costs against the market need to offer superior customer service levels.

The inventory conundrum – How to maintain a sustainable competitive advantage built on a vast SKU portfolio and short customer response times while also improving inventory performance and unlocking working capital

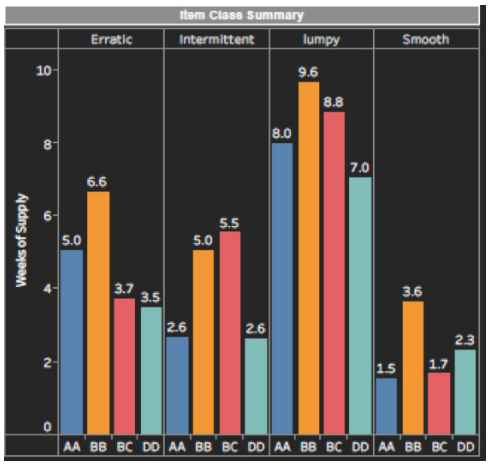
When we began working with the client operations team and performed a diagnostic, it became apparent that the problem was manifold:

1. **Inadequate inventory classification schemas:** While traditional inventory classification methods based on a two-dimensional volume-value relationship were being used, they only addressed the problem partially – one large demand event had the potential to distort SKU classification. Offering differential service levels based on such a naïve classification was at best sub-optimal and at other times, downright risky due to potential stock-outs leading to erosion of market competitiveness.
2. **One-size fits all safety stock strategy:** Safety stock estimates were based on plain vanilla math and rules of thumb under an over-arching normal distribution of demand assumption. The nature (smooth / discrete / lumpy) was not factored in. This led to observed service levels being less than anticipated owing to non-normal demand patterns.
3. **Sub-par demand visibility and stock-out prediction:** One major lacuna for the business was the lack of a stock out prediction mechanism, so as to take advantage of lesser supplier lead times as compared to quoted customer service times and proactively stock up for impending demand.

Approach and solution



- **Identified "Movers and Shakers":** We began by first identifying high impact SKU clusters that would significantly impact inventory dollars and customer service levels. It was apparent that about 8% of the SKUs contributed to nearly 80% of sales and 60% of inventory holdings value.
- **Recognized the nature of demand:** It was important to recognize and classify the nature of demand to ensure that the most appropriate safety stock algorithms were leveraged for optimizing inventories basis the demand distribution pattern. Non-normal distributions such as Poisson and Gamma were found to explain the discrete, lumpy and erratic demand for a majority of the SKUs. Appropriate safety stock algorithms were developed and deployed for each of the different scenarios to provide a far more effective mechanism as compared to a one-size-fits-all safety stock algorithm approach.

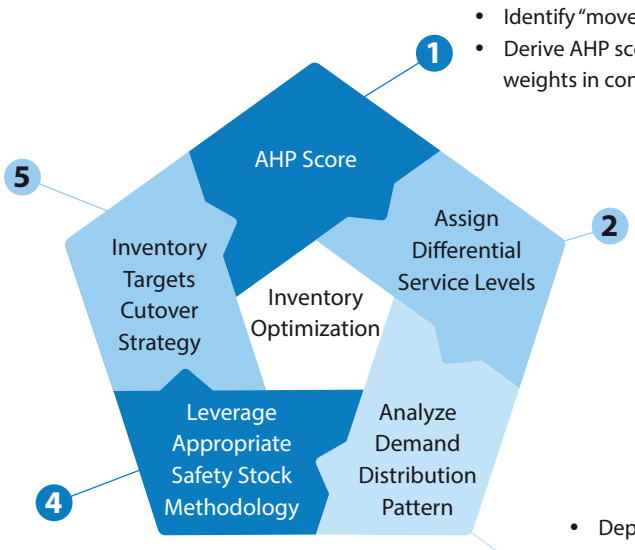


- **A robust and scalable Analytical Hierarchy Process (AHP) framework:** Using the above as cornerstones and combining them with other factors such as the gross margin, lead time, demand pattern, demand variability, and usage value, an Analytical Hierarchy Process (AHP) framework was developed to derive relative importance scores at an SKU level. Based on the score, a High-Medium-Low (HML) grid was developed to have a multidimensional classification scheme for the SKU universe.

Differential service level assignment

Differential service levels were then assigned in consultation with the client operations team to effectively optimize the spread of inventory dollars by category. This would ensure the best return on inventory dollars while freeing up scarce working capital.

The solution approach can be summarized by the five-step framework that was developed and deployed by the analytics team.



- Identify "movers and shakers"
- Derive AHP scores after assigning weights in consultation with business

- Develop a "relative importance" grid of SKUs
- Assign differential service levels after brainstorming with business

- Deploy techniques to codify and identify demand distribution patterns
- Check goodness of fit

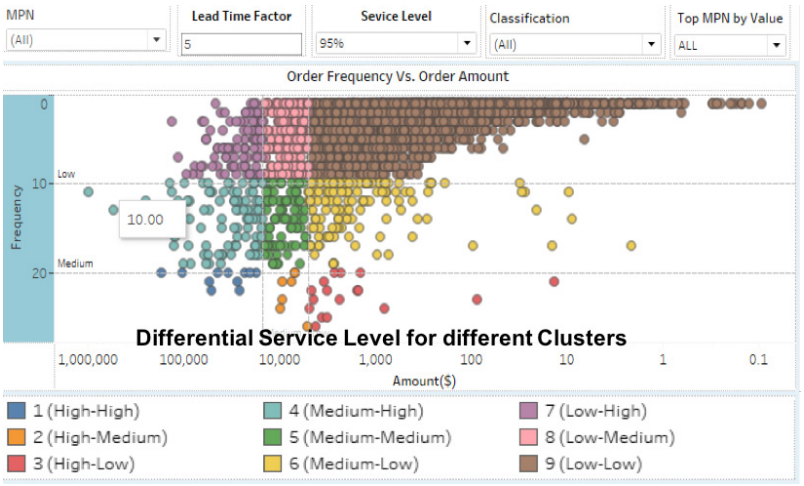
- Develop a library of safety stock algorithms suited for each situation
- Utilize a rules based methodology to leverage appropriate algorithm

- Assess risk/reward ratio of cutover candidates
- Choose between big bang, incremental or parallel cutover (for homogenous product class)

The Importance of simulations and analytic dashboards

Cutting-edge dashboards allowing analytic drill-downs and on-the-fly scenario are key to realizing the full potential of the methodology outlined above and focus attention on high impact clusters. The dashboards built have a comprehensive list of filters and KPIs that allow multiple slicing and dicing runs and promote exception management, especially in situations where the SKU count runs into thousands.

Clustering of Parts based on Order Frequency & Amount



Value realized

1. USD21 million of identified inventory savings across multiple SKU categories
2. 25% reduction in weeks of supply, leading to improved inventory turns and inventory velocity
3. Instantaneous drill-downs and scenario building, promoting agile and exception planning
4. Scalable AHP framework with a host of prescriptive analyses around identification of high-risk suppliers, better demand prediction, and trade-off opportunities

For more information, contact infosysbpm@infosys.com

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