

Leveraging Last Time Buy to Optimize Product Lifecycle Costs and Manage Obsolescence

Abstract

It is common for certain components of electronic products to reach obsolescence long before the whole product does. In such instances, suppliers may decide to discontinue the component and issue a call for Last Time Buy (LTB). LTB is the quantity of components or spare parts a technology company buys in bulk from its suppliers, before the production of those parts is stopped. When taking LTB decisions, procurement teams need clear visibility into their inventory and demand forecasts. Without this information, they may end up buying less than what is required to meet the future demand of the product for its remaining lifecycle, resulting in lost sales and revenue. Alternatively, they may buy in excess, resulting in high inventory carrying and obsolescence costs.

LTB and the Optimization Challenge

A mismatch between electronic parts procurement lifecycles and lifecycles of the product that the parts are used in, leads to significant obsolescence management costs. In an industry where newer, faster, better, and cheaper electronic components are introduced frequently due to rapid technological advances, obsolescence of older components is a common occurrence. Therefore, a major component of a final product might reach obsolescence before the final end product does.

LTB is used as a strategy for managing this mismatch. The opportunity to make an LTB is usually offered by part manufacturers and suppliers prior to the actual discontinuation of the part. The challenge for manufacturers lies in determining the optimal LTB quantity that minimizes the total lifecycle cost of their product. The various costs that contribute to the lifecycle cost are the actual procurement cost, holding cost, disposal cost, and shortage cost of the parts.

Inventory Write-Offs in the Technology Industry

The technology industry, which is characterized by short product lifecycles due to disruptive innovations, suffers from high instances of excess and obsolete (E&O) inventory. Typical inventory turnover numbers across different industries show that semiconductor and network equipment vendors have smaller turnover ratios. This clearly indicates that a large amount of funds are tied up in inventory. Some of the semiconductor companies and OEMs have high inventory write-down costs as a percentage of their cost of goods sold (COGS). The inventory write-down is reported in cost of goods of the income statement as part of non-material spend (NMS), which includes the E&O records.

Ideally, the notice period given by semiconductor manufacturers when issuing an EOL should be 6–12 months, with an approximate 24-month delivery time line. However, according to an IHS report¹, only 50% of EOL notices are issued more than 150 days before an LTB, while 10% of EOL notices are issued within 30 or fewer days.

Key Drivers for LTB

The technology industry can be classified broadly into semiconductor chips manufacturers, which supply chip components, and the original equipment manufacturers (OEMs), that are in effect, their customers. Semiconductor manufacturers issue end of life (EOL) notices in the form of product discontinuation notices (PDNs) to OEMs, indicating that the LTB process needs to be initiated.

For an OEM customer, a discontinuation notice of less than one month does not allow enough time for product redesign, and thus requires an LTB. However, even executing an LTB at such short notice can be risky, as OEMs are unable to forecast demand accurately. They usually end up with excess inventory, resulting in high scrapping costs, and even lost sales. There is also a high risk of purchasing substandard or counterfeit parts.

The factors that drive EOL notices, and the trends that OEMs can follow to anticipate PDNs include:

- Economic stability and chip demand
- Product and procurement lifecycle mismatch
- Shorter product lifecycles
- Legislative changes

With various factors driving EOL notices, anticipating component discontinuation can be a challenge, and OEMs are largely dependent on the forecasting accuracy of their planning systems. However, the shortened product lifecycle poses major challenges to the time series forecasting methods that are fundamental to all commercial demand planning systems. Thus, the burden of sales forecast inaccuracies is borne by the product lifecycle management teams, and finally affects the bottom line heavily through obsolescence reporting.

A Scientific Approach to LTB Decisions

The complexity of LTB estimation needs to be addressed scientifically and analytically. Organizations need to consider various parameters, and analyze the problem to arrive at the most appropriate quantity to be bought at one go from suppliers. When a single component is required for multiple products with different COGS, demand patterns, and lifecycle horizons, the analysis becomes even more complicated. The LTB problem has two aspects:

- 1. Demand Forecasting:** The forecasted demand comprises new sales forecasts based on historical sale trends and an estimate of additional parts required to honor the warranty expectations for current users. Forecasting up to the end of a product's lifecycle (5–10 years) can be difficult given the rapid changes in technology and customer preferences.
- 2. LTB Quantity Determination:** Determining the LTB quantity depends on more factors than demand forecasting, with a single part going into multiple products with different applications. LTB quantities need to take into consideration contract constraints, disposal cost, inventory, order cost, and customer service perspectives.

Cost Balancing to Optimize LTB

Organizations should consider the LTB challenges mainly from a cost balancing perspective. The two major cost components that must be considered are:

- 1. Overage cost:** the cost of inventory for LTB quantity of the product or component in excess of what is needed, resulting in inventory build-up
- 2. Underage cost:** the lost sales cost due to the inability of the organization to sell a product due to unavailability of adequate components required for building the overall product.



These two costs are balanced to arrive at the desired LTB quantity. Organizations must also consider various other business and economic factors that impact LTB decision making.

Conclusion

Using a scientific approach, organizations can drastically reduce inventory costs, and probability of subsequent excess and obsolete inventory. This also allows them to maintain the desired customer service level. Using the proposed approach, OEMs can drive a significant reduction in E&O costs for end of life components or products. For many large device or network firms, annual LTB is in the range of US \$50–100 million, so even 10% reduction in excess buying can help save millions of dollars.

References

- [1] IHS Technology, "End-of-Life Notices Continue Dip, But No Time for Complacency," September 2015, https://www.ihs.com/pdf/IHS-EOL-Update-v3_233335110913052132.pdf, accessed July 2016

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