Excess and Obsolete Inventory: Everybody’s Responsible

The Supply Chain Resource Cooperative held its first ever “Executive Roundtable on Excess and Obsolete Inventory” on the NC State campus on October 25, 2017. The event was attended by 25 executives from a variety of different industries and backgrounds. The objective of this session was to openly discuss some of the challenges that exist in managing this over-looked asset, and begin to shine a light on approaches that can be more effective in dealing with the issue. After much discussion, the executive roundtable identified a number of characteristics associated with a properly developed excess and obsolete (E&O) inventory strategy, which is highlighted in this white paper.

Outsourced Manufacturing and Unique Components in the Electronics Sector

A good amount of the electronics sector involves outsourcing to third-party contract manufacturers (CMs) such as Flex, Jabil, and others. A typical supply chain may consist of CMs, acting as tier 1 order fulfillment providers, tier 2 suppliers (original design manufacturers, or ODMs) doing some joint development, and tier 3 and 4 component suppliers. In this example, the organization does not own the inventory, but it is liable for paying back the CM for inventory that becomes aged. Organizations have started to successfully cut out excess and obsolete inventory, but executives note that struggles still exist.

The first challenge for some electronics manufacturers is custom orders. They are in a build-to-plan and configure-to-order environment, characterized by long lead times for many parts including electronics components and hard drives, and the product portfolio is often very specified and unique. E&O inventory can be significantly reduced by driving towards industry standard components, and reducing the number of unique parts.

One executive mentioned that its company reduced its product line from 700 power supplies down to 24 off-the-shelf parts, which significantly reduced its E&O inventory. Nevertheless, product support for 20- to 30-year-old products requires holding an excessive amount of inventory. This is made even more complicated as companies are bought and sold, which results in further challenges in supply chain coordination.

The second challenge is caused by the transition to the next-generation product line. As product life cycles are often two years or less, the transition to the next generation of product results in supporting multiple technologies, often for decades. “We find ourselves struggling to ramp up the new products while supporting multiple older ones at the same time,” said one organization. This causes challenges for sales forecasting, min/max replenishment levels, and managing excess inventory (or shortages) for many product features. Executives also joke that in addition to “last time buys” (the purchase of products that are going out of production due to age), there are also “latest time buys,” which involve multiple purchases of products as the life cycles keep getting extended and the forecasts change.
A third challenge is the planning and order fulfillment process. This is especially difficult in the PC market with extremely short product life cycles, long component lead times, and production capacity issues in the component market. A lot of the E&O inventory occurs at the end of a product life cycle due to leftover inventory. This requires a partnering approach with the sales team, and becoming more conservative on forecasts towards the end of the product life cycle. The use of channel partners as a vehicle to lean out inventories is a possibility, but this is not possible, for example, in the server market.

One executive in the server market emphasized that to address E&O inventory it requires behavioral changes, which includes identifying the cause of inventory, developing a Pareto analysis around the root causes, driving accountability, and following up with metrics. In some cases, it has been suggested that the sales organization should own E&O inventory to drive the right behaviors!

Another factor in the electronics sector is the difference in supply chain philosophies and cultures that may clash during a merger/acquisition. In one example cited during the conference, Company A viewed inventory as a core part of the business, which is a function of a build-to-order market with a highly customized product, while Company B relied on suppliers to carry inventory.

A major challenge is rationalizing the different views on what the acceptable inventory carrying cost is for each sector. Company A is often creating products for a market that doesn’t yet exist, complicated by unknowns in demand and forecasts. Suppliers sit on inventory for customers that is unique, and this requires a good deal of trust and communication. The big challenge here is sales relationships and accountability.

Company A has traditionally had a close, relationship-based approach with suppliers, due to its low-volume, high-mix, high-margin, and custom components business, which is largely dependent on a reference design every 18 months. In comparison, Company B is largely reliant on data exchange and interaction with consumers as customers, data-based metrics, and high efficiency, as well as control points and decisions based on data in alignment with an intelligence-based cadence.

Other challenges include the different regional cultures (Northeast and Southwest) of the managers and different enterprise resource planning (ERP) systems (SAP APO vs. multiple planning systems). It also requires an ongoing conversation on how to get the best of both worlds.

Managing Spare Parts in the Utilities Sector

An executive from the utilities sector discussed the challenges of managing parts inventories for power generation and distribution during an era of mergers. When companies merge, there is often a difference in systems, cultures, and views on how inventory should be managed. Nuclear energy facilities have very different views on inventory than gas generation. Extra inventory is often viewed as a necessity in the former case. In addition, state utility commissions are very restrictive, making it difficult to move parts between sites in different states, which further restricts the standardization and deployment of parts. The utilities executive also noted that inventory has grown 10 percent annually since 2011, which effectively doubled inventory over five years. Growth of excess inventory is often a function of materials planning for specific capital projects that are cancelled or delayed, contingency materials kept at nuclear plants that are often “stranded assets,” and unique
materials at fossil fuel plants, as well as the move towards new technologies such as solar and wind renewables, and combined cycle plants. A big challenge is developing a demand planning tool to better manage inventories of parts, and link budget and material forecasts based on the amount of planned spending. There is also a lack of an end-of-life strategy, and a lack of understanding on how to drive inventory reduction.

**Capital Projects E&O**

Another important source of excess occurs in large capital projects. Because materials are often not viewed as an expense but as part of a capital project budget, it is often not clear who owns the “write-off” process. Engineers are often incented on bringing in projects on time, and because bringing in additional materials is comparatively less expensive than a crew stoppage, the result is significant excess inventory. Often project teams are forced to work with reseller markets to identify sources to write-off such inventories. In many cases this can be avoided by standardizing equipment to use across multiple projects. In the oil and gas sector, it is often possible to run the decision by an investment recovery group to determine if there is anything that can be substituted. If a reel or cable is worth a lot of money, perhaps there is a way to put it on someone else’s books.

**Inventory in the Pharmaceutical Sector**

Companies in the pharmaceutical sector are trying to drive a standardized process and establish ownership for inventory within the supply chain. One company noted that with the deployment of an end-to-end ERP system, there is greater visibility into inventory in the system, but people are unsure of what to do with it. In particular, companies have focused on manufactured finished goods to expand the scope of logistics services into the supplier manufacturing supply chain.

Lead times and expiration of product have been of particular concern, but up until recently there hasn’t been the right governance and controls to manage the flow of materials to the market. Another challenge is ensuring the right lead times information is put into the system, and the right key performance indicators (KPIs) are measured to help define where the focus should be for cost savings. The amount of effort to pull data on transportation projects versus actual lead times has proven to be exceptionally hard to get. For manufacturing planning, the result is often the execution of the wrong orders at the wrong times, which leads to excess and obsolete inventory.

**Inventory at the American Red Cross**

Every country has its own Red Cross organization. The American Red Cross (ARC) has many inventory challenges, as it supports both the U.S. and U.S. territories. It also is undergoing a profound set of changes to become more responsive, under the leadership of a new supply chain leader, Tom Nash, who has responsibility over enterprise, warehousing, and fleet operations.

ARC’s biggest inventories are at its national warehouses, which are bloated with inventory. The biggest pools of inventory are on the disaster side, where products are accumulated based on contingencies to prepare for disasters. Although everything collected by ARC is ultimately distributed, there is a tendency to want to hoard inventory, so a decision was made to value it at zero.
By de-valuing the inventory, people were no longer being charged with the inventory as an asset on their books, which encouraged them to buy things from national inventories. Because every disaster is local, there was a tendency at each of the five warehouses holding disaster supplies to stockpile inventory, decreasing visibility to it. Instead of using their local stock, they would hoard it for a rainy day, and bring in more inventory from the national distribution centers. This led to excess inventory, which included flashlights that were no longer functioning and blankets so old they were falling apart. It also created another challenge; no one wants to accept the older products.

Blood inventories are another challenge due to a short shelf life and lack of control over the supply channel – the donors. O negative is the most common blood type with the highest demand, and it is manufactured by ARC with the hope that hospitals will take the product before it expires. ARC also faces rising transportation costs as a result of multiple trips to the hospital with blood supplies every day. Blood is also a declining market, as improved surgical techniques require less blood even for elective surgeries, and in some cases, it is not needed at all, which is driving a lot of waste.

ARC’s challenge is how to optimize the supply of blood with a five-day life cycle and reduce cost in a declining market. This has become problematic for three groups – inventory, collections and sales – now responsible for testing and distribution to the end customer versus a single group with true ownership. This has led to disconnects with transportation and potential savings as well as accountability of inventory expenses for all parties on their P&Ls. How to drive inventory flow and reduce obsolescence is a discussion that is taking place right now.

E&O in Industrial Manufacturing

A common challenge in manufacturing is the complexity associated with customization of orders through the dealer network. For example, one manufacturer’s products have over 100,000 components, and associates spend more than 40 percent of their time on forecasting and inventory management. Lead times also vary from two to three weeks, and alignment of transportation delivery times with manufacturing resource planning (MRP) schedules can drive fluctuations in available inventory. Even a small component being late can drive delivery schedules off. Unfortunately, a lot of planning is done in Microsoft Excel, and mistakes often occur.

Common themes among industrial manufacturers include working with suppliers (“plan for every part”) to manage the right planning parameters, improving flow paths, and reducing lead times. An opportunity exists in better managing inventory for equipment maintenance. This is especially problematic for new equipment that has no history of spare parts. Understanding the carrying cost of spare parts inventory including financial and logistics costs can help raise awareness, but there is a need to better understand spare parts inventories in terms of turns, service levels, and service strategies. Maintenance engineers will always argue to hold a lot of spare parts to minimize delays. For expensive new equipment from European manufacturers, there may not be a lot of leverage, and lead times can be exceptionally long.
Another opportunity exists in inventory that is owned by suppliers. This is the case for many product options, such as kits, attachments, etc., that customers order from dealers. The buying company provides forecasts to suppliers, and holds them accountable to provide 90 percent availability to fulfill these orders as well as 98 percent service part reliability. A big challenge exists when forecasts are unreliable, and ensuring processes for tracking orders is key. This arrangement looks good for the buyer’s financials, but causes problems in managing supplier relationships. If processes are not aligned with suppliers, there are breakdowns in communication, and communication is often not happening fast enough. A manager noted that we need to get better alignment from engineering to support, marketing, and supply management groups, and understand where the breakdowns in process flows and information flows are happening.

Emerging Themes

Several common themes emerged from the discussion – E&O inventory is often a by-product of misaligned decisions in areas such as product lifecycles, design standardization, and promotional sales forecasting incentives; the true cost of E&O inventory is often misunderstood and not truly measured, and a lack of communication and a misalignment between consumption and forecasting can lead to further E&O issues.

Elements of inventory cost should be documented, which might include labor (warehouse management), damage, carrying cost, liability insurance, contractual obligation costs, and other factors. But this often doesn’t lead to accountability for inventory by function, and whether it belongs to sales, manufacturing, or purchasing/suppliers.

End-of-life cycles are another component of excess and obsolete inventories. This can occur when a product is phased out, or when a capital project concludes, and there is leftover inventory. Contractual commitments for holding inventory are often not well-defined, and the cost of these commitments are also not factored into the sales account management cycle.

When functional groups don’t communicate decisions it can also lead to inventory issues. Even within functional groups different locations may be buying the same materials but not sharing information. One division may have $10 million worth of inventory, while another one is chasing down material of the same part!

Every industry seems to have an E&O inventory problem, which is often misunderstood and understated. An example was cited of a $4-billion company that believed its E&O inventory was valued at $4 million. After a study was conducted on the company’s E&O inventory, it was found to be $44 million! Most of the company’s material was obsolete, and it had warehouses of material that was 10-years old that they didn’t know was there.

There is also a root cause in the misalignment between consumption and forecasting. In the majority of instances, this is a root cause for much of the E&O inventory problem that exists. E&O is often viewed as a mistake. And when it occurs, it is frequently not acknowledged, and the decision on what to do with it is postponed. Eventually “the sins of the company fall on the supply chain,” and the E&O inventory becomes the ownership of the supply chain team.
Here are important issues to consider when evaluating how to deal with E&O:

- Do you have dedicated resources to manage E&O?
- Do you have a team who handles the issue across all lines of the business?
- Do you have a means to properly measure the cost of E&O?
- Do you formally designate ownership of inventory as a result of supply-forecast-demand errors?

An important point to note is that the forecast can never be “fixed” – forecasts will always be inaccurate. This is unlikely to change due to the shifts that are constantly occurring in the demand of products, the flow of new products, the increased complexity and customization of products, and the end-of-life issues that arise.

**Summary Recommendations**

After much discussion, the executive roundtable identified a number of characteristics associated with a properly developed E&O strategy:

**Assign accountability.** Executives need to *deal with inventory issues as they arise!* Organizations need to be proactive about making an E&O decision; and when E&O inventory does occur, immediately seek to address the issue. Can it be used somewhere else, or can companies assume it won’t be used? If E&O inventory is not used, can companies absorb that cost into the business and recognize it?

**Design products with the end of the supply chain in mind.** Ensure that engineers are more aware of how parts left over at the end of the product life cycle will consume working capital, and train them on these costs. For example, Huawei had a component engineering team reporting into procurement, and they were responsible for dictating components that went into every line of business to ensure maximum flexibility for usage of parts. They forced component engineers to pull designs from existing baskets of parts, which addressed many of the problems with complexity and avoided unique parts.

**Management awareness of E&O impacts.** Is there a senior management team committed to driving down excess and obsolete inventory levels? E&O should be viewed as pure cash. For example, more and more companies are establishing incentives for sales people who now earn part of their bonus based on how accurately they forecast to the SKU level -- not to the planning level--which aggregates many parts; is relatively stable; and is easy to forecast.

**Planning and sales communication.** There needs to be important communication channels between planning and sales managers. The discussion could include a dialogue such as: “How real is your forecast? (I won’t expose you)”. Sales people tend to load their forecasts by as much as 10 percent, which drives the MRP orders. There needs to be a one-to-one relationship
between sales and demand planning to ensure complete transparency and real-time communication.

**Change sales incentives.** It also helps if sales team bonuses are tied to inventory and tied to budget on S&OPs. Metrics on sales forecasts, not only on final shipping but on configuration and BOM accuracy, is an important element. Customer-named accounts and configurations can help to improve sales accuracy; drive accountability for how the inventory was generated to a specific customer order and sales person; and drive accountability six months down the road. Sales people will change their behaviors under these conditions.

**Develop an E&O narrative.** There needs to be a story constructed around how inventory is generated and accountability for the inventory to drive out the buffer-planning behavior that occurs. There needs to be reviews of min-max cycles, minimum liability planning on configured products, and intelligence narrowing of the product portfolio as a result. Product design standards and ownership is key.

**Plan for E&O to be an outcome of mergers and acquisitions.** Several executives noted that mergers of two companies, with different cultures and philosophies about product design, customer service, and the resulting inventory strategy that emerges, can often create a huge amount of E&O inventory. The cycle of business that drives these mergers causes a huge amount of instability in the network, and creates costs that often far outweigh potential savings. This creates a mismatch in systems and philosophies that take years to overcome and stabilize. Once they are finally overcome, the next merger comes along and the cycle starts again.

**Focus on forecasting performance for mix, not final product.** Forecasting performance analysis should be used to understand the strategy around what products/components will be consistently inaccurate. At one company, leaders challenged managers to understand the people ordering parts, and performed a deep analysis on what parts were driven into the supply chain through poor planning activities. Such an analysis can help to prevent such problems from recurring. A pilot project was done to look at service parts through tier 2 components; what was being purchased; what were the MOQs, and have suppliers share what they were seeing vs. what was being ordered. Open discussions with partners on lead times, inventory levels, and forecast accuracy is a good start.

**Measure life cycle inventory cost.** A planning process in the design stage can also help to build in the cost of inventory early on. A best practice at one company is to establish the life cycle cost for components during the design phase, and define the total life cycle cost of having ANYTHING in inventory over the life of the product. At least setting a planned number makes sense and can enable a category strategy around that target to be established.

**Evaluate decision impacts related to E&O.** There also needs to be some work around the cost of decisions and their impact on inventory. What is the cost of an engineering change and the resulting E&O cost? What is the cost of a new product and end-of-life inventory write-offs?
Development cost of product should include tooling, supplier qualification, warehousing, and write-offs at end of life. Focusing on these costs can start the conversation on the cost of complexity.

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Handfield has consulted with over 25 Fortune 500 companies, and his work has been cited in over 24,000 publications according to Google Scholar.