

Establishing Inventory Maturity in a Make-To-Order Manufacturing Environment

LFMcapital

BUSINESS PROBLEM

Accelevation LLC has grown very quickly from its beginning in 2018 via acquisitions and natural expansion. This growth in sales has not been perfectly followed by maturing processes. The lack of established inventory management policies to reduce stockout events and optimize costs presents an especially troublesome issue. The business historically purchased material based on jobs released to production and does not have strong forecasting abilities based on the make-to-order nature of the products. Additionally, physical counts of inventory on-hand often do not align with the amount of material in the enterprise resource planning system.

DATA SOURCES

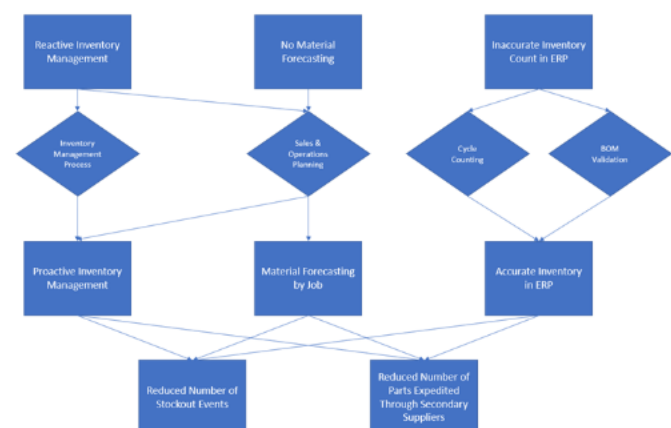
Data came from the Enterprise Resource Planning (ERP) system, from engineering documentation, and from researcher conducted on-site data gathering. Data from the ERP included material demand, Bills of Material (BOMs), order information, and inventory position over time.

Data Types and Format

Primarily time series data, with some cost data and data containing characteristics of parts.

APPROACH

The research will be split into three correlated efforts. A basic re-order level and quantity inventory management policy will be put in place. Next, bill of material validation and material cycle counts will be introduced to improve inventory accuracy. Internal processes for material storage and consumption will also be reviewed. Finally, sales & operations planning will be implemented.



IMPACT

For growing make-to-order businesses, the quantities of materials that are consumed will continue to increase without being able to build finished product stock as buffer. As the supply chain complicates, stock-out events can become a nuisance and slow production. Processes in place also need to be robust to grow with the company's revenues and throughput without additional cost. The legacy processes in this project included manual purchase order quantities and timing with tracking occurring by the buyer's individual checks. With these existing processes, growth requires additional headcount to maintain similar levels of material effectiveness, with likely diminishing effectiveness among more complicated material consumption and orders. Enhancements to Accelevation's inventory management through policy, accuracy, and forecasting enhancements will allow for revenue growth with a less than directly proportional increase in operations support personnel. While the business continues to evolve and serve different aspects of the data center containment market, demand may deviate from historical usage. Processes that plan for these deviations from historical usage will allow Accelevation to plan material beyond their inventory policy for situations where they would otherwise be at risk of stock-out events. In all, creating robust inventory management processes will aid Accelevation's continued growth.

DRIVERS	The solution was largely driven by the past success of operations management techniques at manufacturing operations. The solution included many standard inventory management techniques. The demand forecasting solution was catalyzed by the experience of the former COO.
BARRIERS	Barriers that impacted the project's success were the engagement of cross-organizational engagement in demand forecasting. Also, the ERP in place had limited operational capabilities that prevented effective tracking and traceability as well as a limited array of inventory policy options.
ENABLERS	The operations team and the operations support team enabled the project through their desire to improve the operation and perform at a higher level. The buy-in from this team allowed for regular useful suggestions and feedback on the project and its solutions.
ACTIONS 	To implement the solution, the researcher first performed an initial state assessment to determine the areas of the business that required the most immediate attention. These focus areas were inventory policy, demand forecasting, and inventory accuracy. An inventory policy was developed and implemented, demand forecasting was established via Sales & Operations Planning (S&OP), and multiple inventory accuracy campaigns were started.
INNOVATION	The most innovative aspect of the solution could be found in the inventory policy, where the largest supplier for Accelevation agreed to terms on storage of material with the supplier with far lower lead times in exchange for guaranteed purchase quantities. This agreement allowed for a significant decrease in the amount of inventory required on-hand for Accelevation and shorter lead times for some of their most critical materials.
IMPROVEMENT	The inventory policy is expected to decrease average inventory of parts under the policy by 25% once parts above target maximum on-hand have been consumed down to target levels. With this policy, the number of stock-out events realized from inventory policy related shortcomings decreased per unit produced by 33% in the two months following policy implementation. Stock-outs from forecasting shortcomings decreased 65% following implementation.
BEST PRACTICES	To attempt to replicate the solution, the manufacturing environment should be one that is make-to-order. Also, the organization should likely have volume growth that has not been met with maturing processes at the same speed. Additionally, with high variability of materials used, demand forecasting should be based on sales pipeline and projections together with past usage trends.
OTHER APPLICATIONS	This solution could apply to any small, make-to-order manufacturing firm that has experienced volume growth that outpaces its processes. While many of the concepts are more broadly applicable, this exact solution relies on those characteristics of a firm. However, mature processes in any of inventory policy, demand forecasting, or inventory accuracy should not limit the application of the other areas.