Laboratory for Manufacturing and Productivity

30 YEARS OF ENGINEERING THE REAL WORLD

Modified Dixon–Silver Heuristic (MODS)

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The master production schedule (MPS) is an important tool for manufacturing firms. It is the core system for determining customer service levels and inventory targets. Many industries, such as food processing and repetitive manufacturing, use MPS computing systems as an integral part of operations. All Enterprise Resource Planning (ERP) software packages include a MPS.

MODS is a robust algorithm to calculate the MPS for make-to-stock situations. The primary inputs are the beginning inventory level for each end-item and the sales forecast. Other inputs include holding and setup cost, manufacturing rate, setup time for each end-item, target number of setups allowed per period, and the amount of production capacity.

MODS determines a near optimal MPS in terms of cost along with projected inventory levels. The algorithm considers capacity constraints when calculating the production timing needed to meet customer demand. In addition, MODS effectively handles dynamic demand often experienced in the consumer goods industry.

An important feature of MODS is the ability to solve large planning problems of over 100 end-items spanning 52 weeks into the future. Using special mathematical structures and programming techniques, the computation takes place within seconds.

This is a major advancement as compared to other modeling approaches available in commercial ERP software packages. Rapid solve times allow for re-planning and scenario analysis at an unprecedented level of response to changes in the manufacturing environment such as a spike in customer demand or varying capacity levels. This capability provides a great deal of flexibility in modeling the MPS.

The software code for MODS is available in VBA or Java. The VBA version includes a spreadsheet interface.

MODS has undergone testing, development, and application for ten years and is the subject of several refereed journal articles. It is a proven method for scheduling production.

For more information about licensing MODS, please contact:

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