Integrated Material Resource Planning/Scheduling
in
A Time-Compressed World

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Manufacturing industries are experiencing a period of rapid and complex market-driven changes. Greater customer sophistication, increased manufacturing complexity and increased competition have contributed to these changes and have put significant pressures on many firms. Companies are being forced to compete in a "Time-Compressed World" by quickly responding to changes in customer requirements, dramatically reducing lead-times in product delivery, and increasing the reliability of that delivery. Further, these companies must produce these changes rapidly and cost-effectively in order to compete with both foreign and domestic competitors.

Today's systems and services for the manufacturing industry require advanced approaches to the scheduling of operations in a factory and the integration of that scheduling with material resource planning. Experiences with these advanced approaches have produced reductions in delivery times of 75% to 80%, reduced work-in-process inventories by similar margins, reduced raw material inventories, and have increased on-time deliveries of close to 100%.

The advanced systems are based on a model of the factory that schedules (and continually reschedules) the use of material, machines and people resources to demands and orders placed on the factory. Rule-based systems are used to route orders to processes in the factory, to select material based on current inventory levels and processing alternatives, and to select workstations and staff pools for the processes.

The integrated materials resource planning is tied to actual factory capacities. This integration insures that the material is available when it can be needed and when it can be used. Standard MRP2 approaches require raw material to be purchased too early based on standard "baked-in" lead-times. In other cases the standard MRP2 systems can result in late delivery of products.

Advanced database techniques are used to track the flow of materials and the use of resources throughout the factory. All database updates are based on or triggered by time-based events that occur within the factory. Retrievals are based on historical views about the events relating to given factory objects. These tracking histories are used to analyze the causes of problems with product quality, resource utilisations and delivery delays.

These advanced technologies, together with significant changes in business practices, have had direct impact on the abilities of a manufacturing organization to respond to the rapid changes that are being requested of them.