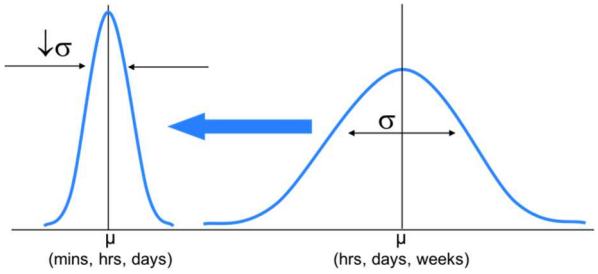
Demand Flow Technology

Developed in the mid-80's, Demand Flow Technology (DFT) is a scalable and comprehensive, mathematically-based business improvement strategy designed to drive high levels of response capability, lead time compression, improve productivity and reducing cost enabling manufacturers to become more effective in meeting the needs of their customers on a daily basis. Demand Driven manufacturing with world-class customer service is achieved through alignment of advanced planning strategies with the response capability of the factory matched to actual customer demand. This creates a fundamental shift in strategy that forms the foundation for a responsive Demand Driven manufacturing organization.

As we all know, customer demand is extremely variable, and at times often volatile, requiring traditional manufacturing operations to maintain customer service levels by employing inventory throughout production as well as in Finished Goods. Conversely, DFT excels in providing the math and science to synchronize and balance the entire manufacturing environment accommodating changes in customer demand with minimal supporting inventory requirements.

Production processes are synchronized, balanced and reorganized in a flow to enable substantial improvement to product velocity through production, with material replenishment systems designed to improve material availability, provide flexibility, reduce overhead and provide early visibility of shortages. Mixed-model flow is established through optimized manufacturing resources supported by dynamic material replenishment strategies to achieve a faster and repeatable response to daily demand. With reduced, repeatable and consistent response that is synchronized to daily demand, global organizations are transformed, regaining control of previously unbalanced production environments along with the high levels of inventory and ever increasing operational costs that are associated with traditional operations.



Reduction in Average Lead Time and Improved Variability

The goal for any company operating DFT is to have an agile production facility that is adaptive to customer demand requirements and is aligned with the entire Supply Chain. The business needs to become Demand Driven to survive and transition itself away from business processes that have traditionally permitted production environments to add significant costs to the business through long lead times and excessive over-production.

Equally successful in all industries, DFT is the science behind flow manufacturing techniques utilized by leading companies such as Advanced Energy Industries, Boeing, Garmin, Hyster-Yale, Industrial Scientific Corporation, John Deere, and Nortek. The importance of DFT to manufacturers was stressed by the former Chairman and CEO of GE, Jack Welch, when he stated "DFT is an absolute business discipline…it's another way to simplify the business."

Employing a proven framework, manufacturers around the world have been adopting DFT for over three decades with transformational results. Utilizing tools such as Product Synchronizations, Sequence of Events, Mixed-Model Process Matrixes along with DFT Operation Methods sheets companies have designed and implemented mixed-model flow with resources that have the capability to handle changes in product volume and mix every day delivering a repeatable and predictable response to the customer. Through alignment to actual demand, instead of a traditional forecast or planned order, the needs of the customer are met through synchronized and adaptive DFT manufacturing environments. By design, the potential for over-production is eliminated, flow is

established reducing lead times and consequently a further reduction in WIP and Finished Goods inventories.

In machine intensive environments, unique mathematical tools determine optimal batch sizes that enable high setup machines to produce closer to actual demand while facilitating production of a greater number of product types each day. With optimized batch sizes and mixed-model flow design, machine environments become more agile and adaptive to customer requirements significantly reducing quality exposure and the working capital position of the business associated with traditional batch production. As machine intensive environments produce closer to actual demand, DFT design releases capacity for the production of what is actually required.

Specific design tools determine optimal product segmentation to be produced through the DFT Mixed-Model Flow Lines and Machine Cells, replacing product specific assembly lines that lack any form of flow, balance or responsiveness. Through the aggregation of demand, the mixed-model design of a flow line will accommodate changes in mix and volume on a daily basis. Seasonal or cyclic fluctuations in customer demand will also be less severe in impact as a wider range of products being manufactured on the same line.

DFT requires flexible employees to work within the manufacturing environment. Line staffing is determined on a daily basis to be aligned to demand requirements. By adjusting staffing on a daily basis and utilizing flexible operators, the DFT flow line will accommodate daily changes in demand without the redesign of the production environment. Employing a technique called Flexing, a team of operators will manage a flow line with more operations than there are operators significantly improving productivity.

The performance of the manufacturing environment is measured using Flow-based metrics. Hourly Flow Rate targets are defined to measure the DFT flow line throughout the day. Every hour, the line is measured against the planned Flow Rate and appropriate corrective actions applied to ensure the planned daily rate is achieved. Overall performance is defined through the measurement of Linearity. Linearity measures how effective the entire production environment is at meeting plan during a month and hence the ability to respond to its customers. By transitioning to Flow-based metrics a business can ensure that performance measurement is aligned to the Demand Driven goals of the organization, rather than traditional metrics that are typically in conflict with a Demand Driven organization.

DFT enhances profitability by leveraging increased speed and response through manufacture. Working capital reductions of 41% on average and an average lead time reduction of 49% are achieved through the capability of DFT manufacturing environments resulting in an average space reduction of 15%. Average improvements of 8% of Cost of Goods (COGS) are attained as a result of significant productivity gains and a focus on flexible employees. Customer satisfaction is seen to improve on average by 9% through improved on-time deliveries and a consistent, predictable, repeatable response. Furthermore, a DFT organization can achieve greater competitive advantage and increased market share realized through the capability to manufacture any product based on actual customer demand rather than a forecast. Competing organizations have few options available to them; they can tie up more working capital with additional inventory, increase levels of overtime, or increase resources.

DFT will impact your business with improved customer satisfaction, compressed lead times, reduction in working capital and reduced Cost of Goods Sold, elevating the business to become a market leader.

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