Cincom’s Demand-Driven Solutions for Complex Manufacturing

Increase Flexibility,

Reduce Costs,

Improve Customer Satisfaction.

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Traditional batch-type manufacturing generally assumes a constant state of demand. It can often be inflexible to the inevitable ups and downs of today’s marketplace. In order to be responsive to customer demand, the traditional manufacturing model typically relies on “excess” to deal with these marketplace shifts. In other words, the fallback for lead-time issues is usually the availability of “excess inventory” – not the most fiscally efficient way to conduct business. Batch-style quality management, also associated with traditional manufacturing, again is not the most effective method for ensuring consistent quality upon delivery. Traditional planning and scheduling techniques, Materials Requirements Planning (MRP), and Master Production Scheduling (MPS) are also not as responsive to changes in customer demand, and are typically “push” rather than the more efficient “pull” model. So, how can we “push” traditional manufacturing into a model that increases flexibility, reduces costs, and improves customer satisfaction?

The Challenge for Traditional Manufacturing

This Could Be Your Future –
- Build product only on receipt of “real” demand.
- Build multiple products on a single line.
- Build products within the order cycle time.
- Respond quickly to changing demand.
- Meet customer expectations by keeping promise dates.
- Avoid costly inventory buildup just to meet speculative demand.

Are You Ready to Make the Move?

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The “Lingo”

**Kaizen:** Continuous, incremental improvement of an activity to create more value with less waste. The term Kaizen Blitz refers to a team approach to disassemble and rebuild a process to function more efficiently. Kaizen will focus on one problem, which may be eliminated by small incremental improvements.

**Kanban:** A replenishment system that uses “cards” or “signals” to convey information, indicating the need to take action (replenish). Kanbans are used to control the production and movement of parts which are pulled to a point of use in response to real demand.

**Demand Flow® Technology (DFT):** A scalable, mathematically based business strategy, specifically designed to allow manufacturers to respond faster and more efficiently to the needs of their customers and the marketplace. DFT is a strategy designed to keep the methodology of manufacturing goods and servicing the customer as simple as possible. Attention is directed at using mathematically based tools to design production processes that are balanced and flexible.
Cincom has long been providing solutions to companies that manufacture products within the complex manufacturing sector. Many complex manufacturers today seek the benefits that can be gained from adopting what can be termed a “Demand-Driven” manufacturing strategy. Other similar operating philosophies that are used to underpin such a strategy include Demand Flow Technology (DFT), Lean Manufacturing, and Flow Manufacturing. The Toyota Production System (TPS) is acknowledged by many to be the forerunner for virtually all of these operating philosophies in use today.

While some application providers have developed software solutions to support organizations that are moving down the demand-driven manufacturing route, the solutions they provide have been, in general, developed for the less-complex and more-repetitive environments.

Cincom however, has been working closely with some of its customers, many of which are acknowledged leaders of DFT and Lean Manufacturing. Together we have developed solutions that address the specific needs of the complex manufacturer in a demand-driven environment.

Mixed Model Production: The manufacture of multiple products on a single line, requires both products and processes to be re-designed so that the constraints that stop a line producing any product, in any quantity, and in any sequence are eliminated.

Lean Manufacturing: A manufacturing philosophy that principally aims to shorten the time between receipt of the customer order and the production and shipment of the product by eliminating sources of waste. Today, Lean Manufacturing has widened its focus to ensure that not only does a product “flow” through the manufacturing process but does so only in response to true customer demand.

Non-Value-Added: Activities or actions taken that add no incremental value to the product being manufactured or the service being provided. It manifests itself in various forms, most of which can be classed as waste. There are many examples of manufacturing waste including over-production, excess work in progress, finished goods and raw material inventories; scrap, repairs and rejects; unnecessary or excessive motion; and excessive processing and queue times.
Value Stream: The specific activities required to design, order, and build a specific product, from concept to launch, order to delivery, and raw materials into a product that can be delivered into the hands of the customer.

Agile Manufacturing: The ability to accomplish rapid changeover between the manufacture of different assemblies. Rapid changeover is further defined as the ability to move from the assembly of one product to the assembly of a similar product with a minimum of change in tooling and software. Rapid changeover enables the production of small lot sizes, allowing for “just-in-time” production.

Six Sigma: A rigorous and systematic methodology that utilizes information (management by facts) and statistical analysis to measure and improve a company’s operational performance, practices, and systems by identifying and preventing “defects” in manufacturing and service-related processes in order to anticipate and exceed expectations of all stakeholders to accomplish effectiveness.

Key Solution Areas to Consider:

- **Knowledge-Based Interactive Guided Selling** – In the mass-customization world where products are not only complex but can be highly configurable, the task of understanding customers’ needs and determining the right product that will meet those needs is often fairly complex and very time-consuming. Using Cincom’s knowledge-based interactive selling and product configuration tools to capture knowledge that is possessed by knowledge workers, which in turn is used to guide the customer through the selection process, will not only dramatically reduce the response time but will also ensure that the product being offered is viable in its ability to meet the customers’ needs and in its “buildability.”

- **Constraint-Based Demand Planning** – Once the sales order has been received, developing the production plan becomes the next area where often problems exist in determining just when that product will or can be built. Again, people are usually centric to this process and the plan development becomes an iterative process. Cincom’s Demand Management application assists you in capturing knowledge about constraints and uses it to sequence demand into available production slots to help you develop and deliver on effective promises.

- **Product and Process Management** – The demand-driven, “lean” manufacturing environment demands that both products and processes are designed to push product variation as close as possible toward the customer. While techniques such as Six Sigma, Total Quality Management (TQM), and Kaizen are used to drive waste, non-value-added activities, and process variation out of the manufacturing process, traditional part-centric and often serial Bill of Material and Process Route management systems may not meet the needs of the lean or demand-driven manufacturer where the need for flexibility and agility requires that both Product and Process configuration be modular by nature, reusable, and manageable. Cincom’s Enterprise Management Solution, CONTROL™ and its configuration management capabilities have been designed to meet the specific needs of the complex manufacturer with the flexibility to support the Product and Process Management requirements of the demand-driven environment supply chain.

- **Production and Material Flow Execution** – For the “pull” manufacturing environment, Cincom’s Kanban Management supports the execution of production processes and the management of the flow and replenishment of materials purely by signals or events occurring downstream in response to real demand. Using electronic communications methods, replenishment requests are relayed both internally to points of supply or externally directly with suppliers. Cincom’s Kanban Management system supports the complete definition, demand analysis, sizing, and execution requirements of the demand-driven environment.

- **Business Process Optimization** – The ability to respond quickly and efficiently to any request, internal or external, can be seriously hampered by inefficient or manually restrictive processes. While important in any organization, a critical factor for the successful demand-driven company is establishing an environment where actions that need to be taken and decisions that need to be made occur in real-time or near real-time. The building of the Real-Time Enterprise is a crucial component in the drive to effectively communicate and collaborate with other people, processes, or systems. In this environment, events need to spawn actions, processes need to be automated, systems need to communicate with other systems, and organizations need to collaborate with other organizations. Cincom’s Environ is the catalyst for the event-enabled environment and is an essential element in helping you achieve your demand-driven goals.
With customer responsiveness in mind and satisfaction as the goal, the Cincom Demand-Driven Manufacturing Solution provides the flexibility needed and the tools required to effectively and efficiently process customer demand. A plan that is balanced, yet responsive to change is imperative in meeting customer-satisfaction goals. It’s here that the real link between the customer and manufacturing is established and where in reality the ability to meet customers’ expectations are realized or ruined.

Cincom’s Enterprise Management Solution, CONTROL, forms the backbone of Cincom’s Demand-Driven Manufacturing Solution, providing organizations with a complete demand-driven, front-to-back office business solution. And, as with all Cincom Manufacturing Business Solutions, the Demand-Driven Solution is fully web-driven, and event-enabled via Cincom’s Environ, a technology designed to integrate systems, improve business processes, and eliminate waste.

Theory of Constraints: Contends that the output of any system that consists of a series of steps where the output of one step depends on the output of one or more previous steps, will be limited, or constrained, by the least-productive steps. The system’s constraint dictates its performance and, if we want to increase the system’s performance, we have to identify and explore the system’s constraint.

Toyota Production System (TPS): Acknowledged by many to be the foundation upon which all existing strategies such as Lean Manufacturing, Demand Flow Technology, and Flow Manufacturing are based, TPS was the first to provide a disciplined approach to seek out and eliminate all forms of waste.

Demand-Driven Manufacturing: A complete business solution, its principle aim is to provide support for a manufacturing environment that is focused on meeting four basic objectives. That is, to produce product to demand, at the fastest speed possible, of the highest quality, and at the lowest cost.

DDM is a solution suite designed to support the unique needs of the complex manufacturer who has adopted or is in the process of adopting a Demand-Driven Manufacturing Strategy.

Push Manufacture: An environment where, in making up a schedule, the quantities and timing of requirements are calculated according to an overall plan, and success means sticking to the plan regardless of actual current requirements at the various stages. In Push Manufacture, any excess stock resulting from lot sizing is naturally moved on to the next stage of use regardless of the fact that there is no immediate requirement for it there.

Pull Manufacture: Manufacture at a rate which is strictly and directly geared to the immediate requirements of the next stage of production, with such requirements being directly communicated by the next stage. Pull Manufacture is synchronized to market demand and is typically controlled by a kanban system.
Cincom’s Demand-Driven Manufacturing Solution

**Cincom’s Demand Manager**

The fundamental aim of Demand Management is to create a viable end-item production plan to support the manufacture of products in time to meet the customer-requested ship date. Developing a plan that is based on the true ability to produce, taking into account all known constraints of the process, is essential to making promises you can keep. Demand Management provides the required capabilities.

**Product Line Profiling – Increased flexibility, greater throughput**

With Demand Manager, you can identify multiple production lines and assign each to a Demand Scheduler. For each production line, the product families and products involved are defined. Production slots are created by product family based on your Sales and Operations Planning output. This establishes the available slots by day.

**Constraint-Based Production Sequencing – More accurate plans, confident promises**

Cincom’s Demand Manager enables you to sequence customer orders based on a set of user-defined rules and mix-model constraints. As part of this process, the Demand Manager will confirm the requested date, or provide the best date possible. All elements that impact the production date are considered as part of this process, for example, available production capacity, production constraints, as well as post-production factors.

**Flex Planning – Manage your complexity and meet customer request dates**

A subcomponent of the Demand Manager, Flex Planning provides the capabilities needed to handle forecast mix errors between product families by sharing manufacturing slots and materials. Flex planning will automatically sequence products into any available slots, within specified limits, enhancing the ability to meet the customer’s requested date.

**Material Plan Generation – Completely control your product mix**

Demand Manager supports the creation of the long-term material plan by generating a plan for materials that is based on the desired daily rate for a production line. The Demand Manager has a unique capability whereby planning bills of material can be generated (based on sales order history) for products sold. Delta bills of material, based on a comparison between product families, are used to plan the additional materials needed to support the Flex Planning process.

**Order Acknowledgement and Production Plan Generation – Enable communication to your customer and to manufacturing**

Once a customer order is sequenced, Demand Manager will pass the promised ship date back to the order management system for acknowledgement to the customer and introduce the demand and supply order into manufacturing.
Cincom’s Kanban Management

Execution of the production processes and effective material control are vital components of success. Cincom’s Kanban Management provides the tools that will plan and execute the production and material pull processes required in a demand-driven manufacturing environment.

Kanban Management techniques are used to “pull” material to its point-of-use purely by signals or events occurring upstream in response to real demand. Management of the flow and replenishment of materials uses modern electronic communication methods that completely integrate suppliers, both internal and external, into the supply chain. The Kanban System provides these required capabilities.

**Kanban Definition – Materials where and when you need them**
Kanban Definition allows the user to identify those parts that will be managed by Kanban, identify points of supply, and define other elements essential for the effective utilization of Kanban techniques.

**Demand and Daily Rate Analysis – Manage material demand without significant excess**
Daily Rate and Analysis determines points of use for Kanban-controlled items and, based on the rate-per-day required, will determine the quantities of components needed at each point-of-use.

**Kanban Sizing – Flexibility to size your Kanbans to desired levels**
Utilizing daily rate information, the system will then size the Kanban accordingly. In addition to using replenishment time, the number of shifts, effective hours, and package quantities, the system also supports container size variations.

**Kanban Maintenance – Customize all aspects of your Kanbans**
The sizing routines only make recommendations. The user can then determine if and when the recommended Kanbans will be introduced into production. Of course, the user can override the recommendations and perhaps increase or decrease the size, or add or remove recommended instances.

**Kanban Execution – Communication inside and outside your four walls**
The Kanban system supports both visual and electronic Kanban execution. Electronic Kanban provides the ability to expand the supply chain well beyond the four walls, communicating your needs efficiently, both internally and externally, by providing Electronic Kanban support directly with vendors.

**Kanban Alerts – Autonomy to keep you focused on production**
Definition, sizing, and execution of the Kanban management are only some of the facets to successfully implementing a Kanban system. The ongoing evaluation and adjustment of its critical components will be essential to the well-being of the system in general and the value obtained operationally. Of course, continuity of supply is essential in ensuring we can build what we have promised to build, but we cannot ignore the impact that a Kanban that is sized incorrectly can have on our operations, both financially and physically. Users will be automatically alerted when certain events occur. For instance, if all cards were in the replenishment cycle, the user would be alerted to this potential stock-out situation. From monitoring the activity, we are also able to identify those instances of slow-moving or non-moving Kanbans and alert the person responsible to this fact. This will give the user the opportunity perhaps to re-size that slow-moving Kanban or locate a Kanban that has had no activity at all.
For the demand-driven manufacturer, the process of becoming “lean” begins with the selling process. Cincom delivers intelligent sales solutions that not only significantly reduce the time it takes to process a customer request from inquiry through to order, but enhances the accuracy of the resulting configuration. This reduces the re-configuration, re-work, and re-plan activities that are normally prevalent within the complex manufacturer’s environment. Whether it’s selling through direct or indirect channels, through distribution agents, or over the web, Cincom can provide solutions that will make your complex selling process a simple one in areas such as:

- **Guided Selling**
  Help your customers by guiding them through what is often a complex process of selection, inclusion, exclusion, options, and alternatives by matching their needs to the right products and services and getting it right the first time, every time.

- **Product Configuration**
  By developing a Knowledge Base about products, processes, selection rules and constraints, then coupling the information you gather during the selling process, you are able to develop accurate and viable product configurations while eliminating the need to “chase the expert” for each and every sales opportunity.

- **Pricing**
  Along with complex products usually come complex pricing requirements. Now you can quickly and accurately develop the right price taking into account any pricing or discounting rules that might apply.

- **Quotation Generation**
  Generate the quotation, on demand, in real-time and in a format that suits both you and your customer.

- **Proposal Generation**
  Need a more comprehensive proposal? No problem, you can easily configure a proposal from a “document set” quickly allowing you to generate a personalized proposal that might include collateral, detailed product specifications, return on investment justifications, and even drawings or pictures.
Cincom's Enterprise Management System Featuring Product and Process Management

Today, superior time-to-market performance is undoubtedly a significant competitive advantage. Cincom provides what complex manufacturers need – capabilities that can make a real difference in both bringing products to market faster and maintaining the existing environment more effectively and efficiently.

While your “re-engineering” efforts seek to eliminate, simplify, or streamline the complexities found in both products and processes, the unique needs of the complex manufacturer cannot be ignored. New product introduction and the frequent maintenance of existing configurations are a fact of life and are often very complex in nature.

Cincom's Enterprise Management System, CONTROL, includes the following capabilities that have been specifically designed to meet the needs of the complex manufacturer, yet are also designed to moderate the impact this apparent complexity has on the overall organization.

- **Document Management**
  Cincom's Document Control capabilities provide the flexibility you require to manage product configurations as you see fit. A document can define the bill of material and process requirements of a complete item or perhaps a “module” of an item. You can develop a library of such documents that, based on specific customer needs, can easily be assembled together to provide the complete configuration profile of a product.

- **Revision Control**
  As “form, fit, and function” changes are introduced, the necessity to “uplift” revisions can often represent effort disproportionate to the value you receive. CONTROL's Revision Control capability is second to none. Not only is it easy to introduce and manage revisions, you can get real value from the results. See inventory, orders, and cost by revision then use substitution and use-up capabilities to minimize obsolescence and maximize profit.

- **Engineering Change Control**
  For the complex manufacturer where seemingly almost infinite variations of a single product are possible, the usual proliferation of Bills of Material and process routes for “like” products results in a maintenance nightmare. The “master” bill of material and process route concept in CONTROL makes engineering change management a simple and easy-to-execute process. The productivity gains are enormous where a change that would normally require multiple “line by line” changes across BOMs and Routes can now be executed by a single interaction with the system.

- **Product Life Cycle Control**
  Taking a product from concept through prototype, to production, to service and to ultimate retirement is a life cycle that can span decades for the complex manufacturer. With CONTROL, you can combine the discipline you want with the flexibility and responsiveness you need to manage that process more efficiently and more effectively than ever before.
Environ – Cincom’s Answer to Business Process Optimization and Application Integration

While the total elimination of all forms of waste for any non-value-added activities is the ultimate goal of the modern manufacturer, the quest to become “lean and mean” can be endless. Whatever remains, value added or not, requires an environment that is driven to respond as quickly and efficiently as possible to events and activities that occur throughout the whole collaborative community.

Cincom’s Environ coupled with Microsoft® Biz Talk® server technologies are the enablers for the Event-Enabled Environment. All Cincom applications are event-enabled which means that as selected events occur within an application, people, processes, or systems can be easily integrated into the business process at hand; enabling faster responses, quicker decisions, and support for the automation of tasks throughout the total community of applications, employees, suppliers, customers, and other partner participants.

Cincom’s Environ helps complex manufacturers improve performance by:

- Automating complex business processes
- Integrating multiple systems of record
- Proactively responding to real-time event processing
- Reducing non-value-added activities
- Providing secure access across the total community
- Effectively managing constantly changing business processes

Cincom’s Demand-Driven Solutions for Complex Manufacturing

### Customer Responsiveness
- Acquisition
- Development

### Demand-Driven
- Supply Chain

### Operational Excellence
- Manufacturing Execution

#### Macro Processes

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#### Cincom’s Demand-Driven Solutions

- Interactive Guided Selling
- CRM for Complex Manufacturers
- Product and Process Management
- Enterprise Management
- Demand Management
- Quality Management
- Analytics
- Business Process Optimization – ENVIRON
- Business Consulting Services

Yellow = Requirement  Green = Suggested Components  Blue = Optional Components
Realize the Benefits of a Demand-Driven Strategy

✔ Manufacturing lead-time reductions 50%-98%
✔ Cycle-time reductions 80%-90%
✔ Inventory reductions 50%-90%
✔ Work-in-progress reductions 90%
✔ Finished goods inventory reductions 75%
✔ Improved quality workmanship 40%-50%
✔ Improved on-time shipments 90%
✔ Increased throughput 20%-50%
✔ Increased capacity 30%-40%
✔ Decreased space requirements 30%-40%
✔ Decreased scrap and rework 40%-50%
✔ Improved productivity 30%-40%
Take advantage of our experience.

To serve your manufacturing needs, contact Cincom today.

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