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Quick Response Manufacturing

Abstract

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Historical Significance of Quick Response Manufacturing

Over the past century, manufacturing strategies have evolved from high volume/low cost to quality improvement. Now, as an additional minimum requirement, manufacturers must address quick response. Whatever the reasons for pursuing a lead-time reduction strategy—customer demands, competitive disadvantages that result in lost market share, high costs or low quality—time compression across all company processes is critical to growth. In some cases, it means survival for today's manufacturers.

The challenges of manufacturing a product have changed and evolved through a series of stages including an emphasis on economies of scale, time-and-motion efficiency, cost reduction, and quality improvement in the form of zero defects. These are all important as minimum requirements for doing business, but the latest dimension, and the one that holds the key to long-term, wide-ranging success encompassing the entire value chain, is speed. It not only offers this promise but does so while achieving all the other objectives combined.

Originating in the late 1980's, quick response techniques are needed more than ever to compete in today's global economy. Over the years, these techniques have been interchangeably referred to as time-based competition, time compression, fast-response, fast-cycle, lead-time reduction, faster new product introduction (NPI), time-to-market, and most recently, quick response manufacturing (QRM). (For the purposes of this report, these terms will be used synonymously.) Despite the differences in names, these techniques all share a common goal. They are designed for the relentless reduction of long lead-times that result from non-value-added (NVA) activities. In a manufacturing organization, these NVA activities can account for as much as 95-99.5 percent of all time on a given process. With great strides in QRM, companies have achieved lead-time reductions of 50 percent or more in manufacturing, product development, sales, and office operations.

CASE STUDY 1

Take the example of a manufacturer of 9-1-1 communications systems. For this company, customer responsiveness is critical because of the heavy reliance on these systems to provide for the public safety. Using their ERP system as the information backbone, they are able to provide technical support and, when needed, determine part availability and ship parts the same day.

Their customers have Internet access to their datamart of parts and descriptions. They can enter the system, and access repair logs and service call statuses–putting information in the hands of those who need it, when they need it–facilitating one segment of the QRM chain.

Supporting this type of result are the results of the 4th Annual IndustryWeek Census of Manufacturers that indicate that plants who have implemented ERP have higher finished product first-pass yield (scrap and rework affect lead-times), lower manufacturing cycle time, lower customer lead-time, higher on-time delivery, and as a result of all this, lower costs. How ERP and QRM are so naturally aligned and accomplish these types of results is the subject of this paper.

QRM and A-S-A

Lead-time reduction strategies and QRM have been defined in many ways. Most QRM definitions narrowly address one area of the company, such as new product development (NPD) or, more often, manufacturing. When applied to the entire organization, QRM can be defined as follows:

> Quick response manufacturing alters the basic structure of the organization's work in critical processes to minimize the unproductive consumption of time. Quick response manufacturing espouses a relentless emphasis on lead-time reduction. It responds to customers' needs by rapidly designing and manufacturing products customized to those needs, and reducing lead-times in every aspect of a company by eliminating NVA waste (Stalk and Hout, 1990 and Suri, 1998). The goal of QRM is to get the right product to the right place at the right time at the right price.

The common elements found in most lead-time reduction efforts include:

- Product-oriented work cells with cross-trained workers who control activity at the cell level
- Smaller lot sizes of both product and information
- Lead-time reduction as the most important, single measurement
- Analysis of processes to identify NVA activities
- Rethinking and reduction of elimination of NVA activities
- Time compression across all departments, not just manufacturing
- High-level bill-of-materials (BOMs)
- Decreased manufacturing variability
- Combination of pull- and push-based production techniques
- Company-wide understanding and commitment

QRM techniques that incorporate the above elements have resulted in extraordinary improvements (50-100% or better), including:

- Reducing overall lead-times
- Bringing new products to market faster
- Increasing competitive advantage
- Reducing scrap and rework
- Lowering costs
- Recognizing premium pricing
- Improving quality
- Increasing customer satisfaction and loyalty

Further, the ¼-2-20 rule states that for every quartering in time to provide a product, productivity can double. Companies that cut their consumption of time can also reasonably expect to enjoy growth rates of three times the industry average with two times the industry profit margins. These results offer a reason for the sustained momentum behind the QRM movement and show why it's necessary to understand how Enterprise Resource Planning (ERP) fits into a QRM environment.

A very simple technique for achieving such dramatic results is the A-S-A technique – Analyze, Simplify and then Automate. Understanding and documenting current processes and

measurements is required for the success of a QRM project, both because it will provide information about what to change and a benchmark of the existing conditions. Simplification takes the form of reducing or eliminating non-value-added processes. For example, generating an invoice for a shipped order does not add value to the product. In the final step, generating this invoice can be automated upon the condition of updating the system order status and automatically generating the invoice (and sending via EDI, fax, etc. if possible). Thus the ERP system becomes the tool for giving life to a QRM strategy.

Complementary Nature of ERP and QRM

ERP has established a strong heritage of support for lead-time reduction techniques. Its strong manufacturing engineering base has the required fundamentals for supporting and measuring the accelerated movement of materials, orders, resources, and information. Enhancements continue to provide and improve the fast-cycle capabilities to improve rapid launch of new sales orders, assist in advanced scheduling and integrate trading partners.

ERP plays an important, albeit supporting role in the deployment of a lead-time reduction strategy. ERP is neither the strategy for lead-time reduction, nor the solution to be deployed. Rather, ERP must be aligned with quick response techniques in order to facilitate the quick movement of jobs, projects, processes and information across the enterprise. ERP is in a unique position to accomplish this because of the pervasiveness of ERP implementations across the manufacturing industry and its far-reaching ability to extend and integrate manufacturing functions.

ERP supports a wide-range of QRM techniques. It accelerates information moving through a company's operations. It provides instant access to information whenever it's needed, as soon as it's needed, to whoever needs it. It identifies NVA time that can be reduced or eliminated. ERP eliminates untimely or irrelevant information. Similarly, lead-time reduction methods always require smaller batches of product that can be produced in shorter periods of time. Most importantly, ERP provides the infrastructure to improve responsiveness and reduce lead times across the entire value chain, from product development, to collaboration with suppliers, to anticipating and identifying customer requirements, to manufacturing, sales, service and the incremental development of new functionality throughout a product's lifecycle.

In the following table are a list of major ERP capabilities that are related to a QRM strategy along with their associated impacts and reasons for using them. This is not a comprehensive listing, nor should it be viewed as a list of the latest buzz-word compliant terms. These are capabilities that exist and can be implemented today. Some will be discussed in this document. Others will not, but they are no less important.

The remainder of this paper focuses on the reduction of lead-time in its various forms across the manufacturing organization using the capabilities in the table above. Each ERP capability is discussed in relation to its ability to accomplish this objective. Rather than being redundant, this focus on lead-time reduction serves to emphasize ERP's strength in providing many of the tools necessary to support a QRM strategy. Because of the value chain scope of QRM, this paper covers the entire manufacturing enterprise by reviewing ERP support for QRM in product development, sales, manufacturing, and office operations. A final section is devoted to the measurement aspects of lead-time reduction.

Quick Response Manufacturing – Major ERP Capabilities and Impacts

Eliminate Process Steps	Minimize Process Time	Combine Steps	Improve Resource Availability	Improve Resource Assessibility	Measuring & Tracking
Product Lifecycle Management	BOM Management	Planning Bills	Vendor Managed Inventory (VMI)	Sales Consignment	Enterprise Performance Management
Collaborative ECO Management	Copy Bills	Repetitive Mfg & JIT	Availability-to-Promise (ATP)	Truck Scheduling	Mfg Lead-Time Management
CAD Interface	Copy routings	Work Order Groups	Purchasing Consignment	Plant Maintenance	Monitors
Configure-to-Order (CTO)	Depot & Field Service Orders	Linked Work Orders	Demand Planning & Forecasting	Web Publishing	Decision Support
Service Contract Administration	CTO	Primary & Alternative Sequences	Advanced Ship Notice	QRM	Vendor Performance Rating
Blanket PO's	Work Order Management	Repetitive Order Groups	Advanced Planning & Scheduling	Repetitive	Work Order Management
Electronic Funds Transfer	Integrated CAD Viewer	Master Production Rate-Based Scheduling	Outplant Services	Warehouse Management	Quality/Defect Reporting
CRM	EDI	Shop Floor Data Collection	Decision Support	Multiple Facilities Management	Shop Floor Data Collection
Shop Floor Data Collection	Project Status Summary	Logistics Interface	Quality Managment	KANBAN Support	Lot Tracing
Monitors	E-mail	Return to Vendor			Serial Number Tracking
Web Sales, CTO & Service	Workflow				
	Enterprise Knowledge Portals				

Product Development

Manufacturing's ability to meet quality, cost and lead-time targets starts with, and is dependent on, how well engineers execute design engineering. High quality and design for manufacturability eliminate mistakes in purchasing, rework in manufacturing, engineering redesign and unnecessary costs, as well as improving a company's ability to market and sell its product. Given that 80 percent or more of the engineering process is NVA time, it's critical to have capabilities that eliminate as much waste as possible.

In the early stages of new product development, engineering should involve the other departments participating in the launch of the new product or engineering revision. To aid in the overlapping of activities and the transfer of small batches of design information to manufacturing and sales before design completion, engineering or prototype bills allows engineers to do "what-if" scenarios. These scenarios help the company test purchasing's ability to source component parts and manufacturing's ability to build the specified product. They also allow lead-time and costs to be determined. The results of early involvement can save as much as 50 percent in time to new product introduction.

When creating a new product structure, copying bills and routings improve the accuracy and accelerate the process of introducing a new or enhanced product to manufacturing. Rather than recreating the entire product structure and routing, the bills and routings function uses existing, similarly engineered products to reduce the time to generate custom quotes, costing and lead times. With strict engineering change order (ECO) control, other departments (e.g., production planning, purchasing, inventory, sales, manufacturing engineering, and vendors) can begin preparing materials, routings, sales orders and so on, to introduce changes into the manufacturing environment. Lead-times are reduced by eliminating waste in coordinating the purchasing and use-up effectivity control of obsolete materials and avoidance of orders based on wrong revision levels.

Manufacturers with design teams that are effective in these areas are able to:

- Capture market share by getting products to market earlier
- Recognize price premiums by being first to introduce new technologies
- Reduce obsolescence of designs
- Decrease rework and manufacturing costs
- Increase engineering new product introduction (NPI) capacity

Sales and Service

The customer interface is an often-overlooked activity. Sales is concerned with four factors: cost, features, quality, and availability. Since back-office processing time frequently accounts for more than 60 percent of the total lead-time (Stalk and Hout, Competing Against Time, 1990), there is a great opportunity to eliminate or automate the flow of information. Move and queue time of order information traveling from one department or person to another can also be improved.

As customers' needs change, they may want more or different products. With Sales Force Automation (SFA) your sales force can provide accurate and up-to-date quotes, while meeting with clients or prospects, on the precise product in the configuration they want. Reps may look at pricing options, order history, promise dates and standard and custom configurations. All this is available "on-the-fly" using the sales reps' laptop. Quoting, order configuring, order status and available-to-promise can all be rendered remotely. In this era of quick response manufacturing, SFA can quickly boost customer satisfaction and secure a competitive advantage.

With SFA:

- Sales laptops become portable offices

- Same capabilities apply that are available in sales order processing, sales quote processing and configure-to-order
- Sales orders and quotes are entered from remote laptops
- Database updates are bi-directional for on-the-spot pricing, availability and other information
- Access is available to customer-based catalog pricing
- Customer contact records are accessible
- Fast verification of unique product configurations and pricing are allowed
- Fast and accurate quotes can be generated
- Order status can be checked remotely
- Current available-to-promise dates can be provided
- Quick response to needs is met through advanced customer analytics

To narrow the gap between a manufacturer and its customer, new Vendor Managed Inventory (VMI) capabilities reduce time from customer need for replenishment to order and delivery. VMI helps compress the time to wait for customer orders, and reduces customer and supplier buffer inventories (i.e., response time work-arounds) as well as order changes. Customer inventory transactions (e.g., issues) are fed online to the manufacturer who, based on a blanket PO, can automatically identify when an item drops below the minimum on-hand quantity and launch a sales or work order.

The CTO system accelerates the transfer of knowledge from engineering to sales and manufacturing by predefining models, options, conditional rules, bills, routings, and pricing. This coordinated transfer of knowledge eliminates the fumbles and delays associated with engineering each and every order. CTO promotes standardization, increases product variety and decreases production variability by reducing the number of custom engineered orders. This decreases lead-times by getting orders into manufacturing faster with predefined bills, routings and fewer setups. Mobile CTO brings the manufacturer and customer even closer, and closer means faster.

CASE STUDY 2

In the case of a manufacturer of technology-driven equipment for the gaming industry (i.e., slot machines), they use CTO to reduce processes that took days and weeks to seconds. Each product is so different it's almost like an engineer-to-order environment. Customers choose denominations, payout tables, glass, lights, plating and other options and features. Traditionally it would take days and weeks for engineers to create a custom design for each order. With the configurator they enter the order, create the bill and routing, roll up the costs and calculate the price – all in a matter of seconds. The effect was to slash lead-times across their enterprise.

During the sales cycle, available-to-promise calculations that use a critical path lead-time calculation ensure more reliable delivery dates and identify processes with long lead-times. A quick response manufacturing feature minimizes the number of transactions required to fulfill orders by allowing purchasing to receive materials directly to the shop floor for consumption. Then, when the sales order is booked, work orders can be issued directly to manufacturing and automatically relieve inventories when the order is shipped. By producing product at the same rate and mix as incoming orders the QRM application has reduced order steps by 86 percent and delivery time by 80 percent.

Sales consignments, where "we own it, but the customer has possession of it," helps integrate customers into the QRM process by putting inventory at the closest point-of-use (POU). Integrated with sales order entry, invoicing and A/R, stock is removed from on-hand balances (with no impact on manufacturing and planning) while maintaining tracking, control, shipping and invoicing. To further integrate the customer into the QRM process, advance ship notices from suppliers to customers reduce the delays in customers being able to start jobs or operations. Truck scheduling coordinates loading and delivery of customer shipments with production, generates the shop floor dispatch list in truckload sequence, and allows delivery

routes to be set up for maximum efficiency. Time is minimized between order completion and truck loading – improving the real lead-time.

Closing the loop after the sale, service call management documents calls for product service, and prioritizes and notifies appropriate personnel of actions to be taken. The service call management capability reduces the time for problem resolution and eliminates the possibility of open cases falling through the cracks. Both service call management and quality systems document and close the loop with engineering by identifying warranty, service and production problems. Problem codes, reason codes and cause codes help manufacturers more efficiently fix product defects that often cause increased manufacturing lead-times resulting from scrap and rework. These codes also can help reduce costs and connect time-based strategies to the needs of customers.

Manufacturing

Manufacturing is the natural place to look for lead-time reduction. Manufacturing has been studied more than any other area of a manufacturer's business. Producing more products, in greater variety, with lower cost, in less time requires manufacturers to rethink the fundamental processes involved.

Repetitive manufacturing and demand flow techniques require a fundamental change in the manufacturing process. It takes into account, and goes beyond, principles that have been used in many time-compression projects, such as small lot sizes, product-oriented layout with local control, JIT and Kanban. It simplifies operations and reduces paperwork by eliminating work orders, reducing items and levels in BOM's, and incorporating high-level MRP planning on a daily flow basis at a component level rather than at a work order level. Blanket purchase orders, vendor schedules and delivery synchronization ensure the availability of materials to support the flow rate. Materials are received and delivered directly to point-of-use, such as an assembly line where usage and costs can be captured. Material movement can be pre-specified at designated points to reduce time waiting for parts. To complete the cycle, backflushing of component inventory is performed based on completed production. The repetitive manufacturing process reduces the number of steps required to manufacture product. It minimizes the number of times an order is touched and open to error, while offering a simpler and faster flow of materials and information.

CASE STUDY 3

A manufacturer of fastening equipment for the construction industry (i.e., nail guns) was able to automate their manufacturing process from receipt of materials through shipment. Using repetitive manufacturing to establish what they termed a market rate of demand for production, they order and receive raw materials directly to the point-of-use in the plant. When issued to the job, the accounts payable system is automatically triggered to pay the invoice for the materials. The product is built and when shipped, the accounts receivable system is automatically triggered to generate an invoice. Results include cutting sales order steps from 84 to 12 and reducing customer lead-time from 5 days to 1 day.

Repetitive order groups (ROGs) manages groups of production orders by coordinating the processing of multiple orders in a continuous operation. ROGs reduce manufacturing lead-time by scheduling parallel or combined operations in order to minimize queue time for downstream cells needing the output of this operation. Additionally, products can be sorted and produced sequentially according to size, color, shape, metal type, etc., to help reduce setup time, changeover time and lead-time by up to 20 percent. Further setup reductions can be achieved by running "like set-ups" together, sequentially or with overlap through work order groups (WOGs). By including tooling in the list of resources, tools are scheduled and delivered when needed.

An alternative technique known as master production rate-based scheduling (MPRS) levels production rates and eliminates the effect of demand variability. It smoothes out the ups and downs of production, eliminating backlogs and reducing lead-times by establishing a planned and budgeted utilization rate. Increased throughput can be achieved when product can be made to a plan rather than reacting to cyclical swings. MPRS eliminates padded lead-times traditionally established by each department. MPRS can be set at a level (e.g., 80 percent) to

minimize idle time and produce the shortest lead-time while addressing queue time and variability of job times.

Rounding out the manufacturing capabilities, plant maintenance reduces variability of machine time and overall lead-time by making sure machines are not going down unexpectedly. Scheduling can be based on mileage, calendar and cycles, or manually user-defined. It also supports warranty tracking, parts inventory, purchase order creation, skill levels required for repairing equipment, work orders, and costs. Without this often overlooked piece of the puzzle, managing a QRM implementation can be nearly impossible due to machine downtime variability.

eCommerce and QRM

Electronic commerce also plays a role in the QRM principles for making sure information moves in a frictionless fashion to whoever needs it, when they need it. eCommerce cannot be covered in any length in this paper, but with the business-to-business (B2B) transactions forecasted to reach or exceed $3 trillion, it can hardly be ignored. Nor are manufacturing executives doing so. Practically all have a corporate Web site and nearly a fourth are involved in an extranet linking up to customers and/or suppliers. The applicability to QRM is obvious in its ability to make information instantly available and increase visibility across the supply chain.

The hottest eCommerce technology strategies that the integration of the entire supply chain are eProcurement, Product Change Collaboration (PCC) and Knowledge Portals. eProcurement is all about connecting the manufacturers with the right suppliers and is represented in electronics by companies referred to as trading exchanges. These trading exchanges seek to reduce the time and cost of procurement by eliminating and combining entire parts of the process of researching, contacting, bidding, contracting, logistics and payment. PCC and cCommerce are all about creating collaborative environments between members of complex supply chains. PCC provides collaboration during product development and throughout the product lifecycle for managing design and change information and processes to shorten the introduction of new products and revisions that with a level of form, function and fit because they are jointly developed with suppliers, manufacturers and customers. cCommerce brings collaboration to the manufacturing cycle to provide two-way visibility between manufacturers and their customers and suppliers. Simplistically speaking, suppliers see what's needed, when it's needed and customers see the up-to-date status of their orders. There's more to it, obviously, but the idea is that connectivity, visibility and collaboration means less wait time and queue time for all members of the supply chain and the ability to respond in the shortest possible time – key principles of QRM.

Knowledge Portals offer a more flexible way to accommodate eBusiness strategies, providing entry and exit points between systems with a common or translatable data format. For example, through a portal connecting a supplier and its customer, Vendor Managed Inventory (VMI) is just one type of eCommerce technology that dramatically shortens the process from customer need to order entry to production and shipping. Through VMI, a manufacturer has direct, on-line access to its customers' current inventory. When parts are issued to a work order from the customer's inventory, the transaction is sent to the supplier who keeps track of replenishment levels and can automatically generate new requirements and orders based on the order in the system for that customer. Any batch size can be accommodated by VMI, avoiding overstocks and out-of-stocks. And the relationship with the customer is much closer. Other portals may be by roles (e.g., sales, service, etc.) or by industry – called Vortals – providing customized industry information.

Office Operations

Because they make up the majority of lead-time, procedures in the backoffice are even more important to consider than procedures in development, manufacturing and sales. It is not uncommon for the movement of documentation and queue time at each stage to make up more than 60 percent of overall lead-time.

Workflow empowers employees by applying conditional rules to processes to determine which decisions need what level of approval. It reduces intellectual and physical rework and lead-time by ensuring consistency in processes.

Workflow is based on an event/condition/action (ECA) architecture. It triggers actions, such as e-mail messages, alarms and faxes, when predefined events occur. These events are often associated with conditions, such as a new ECO, a credit limit or a purchasing authorization amount. When an ECA that is carrying its associated data is triggered, a series of activities to multiple users can be initiated. It is not difficult to see how time can be saved throughout the entire value delivery system by making information timely and relevant. In cases such as customer quotes, where engineering revisions, purchasing, production planning, credit and other departments are involved in the process, workflow automates, combines and ensures the proper sequence of office operations. Information is moved immediately instead of waiting for batches of information to be ready to move. "White-collar" NVA time is greatly reduced along with errors in re-entering data and sending on-line notifications. Costly rework, which is a major cause of long lead-times, can be virtually eliminated.

The Internet, e-mail and EDI continue to be major trends extending the use of electronic communications in the office environment. When integrated with sales order processing and accounts receivable, EDI and electronic funds transfer (EFT) speed the receivable process by allowing invoices and payments to be electronically transmitted as soon as customer orders have been shipped. EDI can be applied to the automation of many areas of office procedures, including quotes, purchase orders, sales orders, order acknowledgements, and advanced shipping notices. Mundane and repetitive tasks, redundant data, human error, and rework are minimized. EDI is designed to shorten the time gap between a manufacturer and its customers and suppliers.

With the proliferation of e-mail, many business transactions are being handled on-line both inside and outside the company. The combination of an ERP system and the Internet provide the ability to access the system over the Web regardless of location. For some time, pointers to Web pages from within ERP applications have provided access to Web pages, such as vendor product pages. Most recently, Web publishing has made it possible to publish virtually any report to the Web from within the system. Providing customers and vendors access to instant and up-to-date information such as invoices, shipping notices, engineering changes, and purchase orders provide a giant step towards reducing the order-to-cash cycle. As Web-based technologies evolve and mature, both customers and suppliers will have even more immediate access to the information on which they need to act quickly and in concert with the manufacturer's QRM strategy.

Measurement and Tracking

Measurements for quick response manufacturing vary. The measurements include, but are not limited to, manufacturing lead-time, new product introduction time, order entry-to-ship time, and break-even time. Regardless of what is measured, lead-time reduction must be the metric used.

Manufacturing Lead-Time Management (MLT) supports parallel sequencing of operations in order to reduce the total manufacturing lead-time and provide a more realistic view of how work is actually performed in the factory. MLT allows operations to overlap up to 100 percent so that subsequent operations can start before a previous operation is complete. Materials are transferred in smaller batches when complete, thereby reducing lead-time by completing all operations more quickly. Consideration for move time, queue time, outplant services, setup, pick, inspection, put-away, overlap, runtime, yield, shrink/scrap, and spread is standard. Lead-times can be based on quantities and be manually established, or "calculated" or linear. Plans are based on standard or calculated lead-times. After introducing QRM improvements, lead-time data can be collected via automated data collection and compared to standard lead-time measures. MLT can then be adjusted to reflect new lead-times and generate more realistic plans that build confidence in the schedule.

Monitors detect variances from lead-time targets. A monitor is a dynamic window of information that automatically displays data and refreshes without user intervention. They are similar in function to flight monitors at airports and are especially useful for information that

needs to be checked periodically or that triggers some action. Monitors can track lead-times and determine the up-to-date status of outplant operations. They can identify bottlenecks, real-time orders, on-hold orders that require management decisions (e.g., credit hold), late customer shipments, delinquent service calls or any other process for which data is maintained. To further accelerate the pace of taking actions, monitors have drill-down capabilities to view details of items requiring attention.

Vendor performance rating and the ability to select an approved vendor controls engineering's selection of components that can be used by manufacturing. Ratings can include reject rates and delivery performance (early, on time and late). By comparing purchase order date and receipt date, vendor lead-time can be quickly determined.

Prerequisite to the ability to quickly assess lead-times is automated data input (ADI) and shop floor data collection, a real-time method of collecting more timely and accurate information on work order status. Bar coded shop and inventory paperwork enable shop employees to scan and record data as they complete work. ADI eliminates unnecessary and slow data entry by providing better and faster information on what can be made and/or shipped, quicker identification of quality and rework problems, and faster and more accurate updates to inventory and schedules. Automated data collection provides up-to-the-minute visibility into the shop floor. This improved visibility helps jobs move faster with less queue and wait time, by manually and quickly moving information about upstream operations.

Faster Flow of Product, Process and Information

A quality process yields a quality product. QRM is all about rethinking and improving processes. This involves eliminating idle or dead time wherever it exists, processing work in smaller batches and maximizing value-added time. It is said that the success of a lead-time reduction effort is determined more by how it is implemented rather than by what is implemented. Although a sample of the major ERP tools supporting QRM implementations has been discussed, many other capabilities exist that can be used to assist with time compression. It doesn't require the most advanced technological solutions. It depends on how they are deployed. To those who deploy them right, the results translate directly to company profitability and growth. These results include faster NPI, technology leadership, reduced costs, and increased market share, customer satisfaction and loyalty. It is important to fix processes first, then automate, not rushing in too fast without seriously rethinking how the business is run. Having done that, there's no doubt that time is a key factor in determining which companies grow and succeed and, conversely, which ones stumble and fall (Fred Smith, CEO, Federal Express Corporation, 1988).

About Epicor

For 20 years, Epicor has been a recognized leader dedicated to providing leading edge enterprise software solutions to midmarket companies around the world. With over 15,000 customers, Epicor delivers end-to-end, industry-specific solutions that enable companies to immediately improve business operations and build competitive advantage in today's real-time global economy. Epicor's comprehensive suite of integrated software solutions for Customer Relationship Management, Financials, Manufacturing, Supply Chain Management, and Services Execution and Control provide the scalability and flexibility to support long-term growth. Epicor's solutions are complemented by a full range of services, providing a single point of accountability to promote rapid return on investment and low total cost of ownership.

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