Seeing the Future in Discrete Manufacturing: Paving the Way for Success

A PERSPECTIVE ON THE GLOBAL DISCRETE MANUFACTURING INDUSTRY

white paper

Company Overview: About Infor

Infor is a top-tier global software company that today is helping more than 26,000 customers in 70 countries solve their pressing business problems.

Building on its 25-year record of successfully delivering enterprise software solutions to companies worldwide, Infor has developed the strategy, products and industry expertise to serve the long-term needs of customers in the automotive, discrete manufacturing, process manufacturing and wholesale distribution industries.

The Infor team of experts is focused on giving its customers fast return on investment and increased competitive advantage through a portfolio of solutions that address customer management, execution management, financial management, logistics management, performance management, resource management and supplier management.

Executive Summary

Look around.

Within 50 feet of you there are probably thousands of products that determine how you live your life. Mobile phones, computers, household appliances, automobiles, consumer electronics, clothing, furniture. Leave the house or leave the office and you are presented with thousands more.

Say what you will about the emergence of a services economy. It's still the manufacturing of these discrete products and the materials and equipment that are used to make them that drives much of the economic activity in developed countries worldwide.

The importance of discrete products to the developed and developing economies of the world is not in question. What is in question is who will make these goods, how they will be made, where they will be made, how much they will cost and who will buy them.

These are pressing questions for consumers, governments, and businesses the world over. They're a mind boggling set of questions for decision-making executives in discrete manufacturing. And given the transformational change underway in manufacturing today, reaching the right conclusion is getting harder and harder.

The right answers today are not necessarily the same as they were a year ago. How executives at manufacturing companies answer the questions – and better yet anticipate what will be the right answer six months, a year, two years from now – will determine the success of their company or even if it will survive. For more than 25 years, the team at Infor has been analyzing these questions with an eye toward developing and delivering the software solutions that best help their customers build and retain competitive advantage. For more than 25 years, the team at Infor has been getting the answers right.

In keeping with this commitment to leadership, Infor has analyzed the current industry trends and the implications they are having on discrete manufacturing companies worldwide. This report includes an analysis of the transformational trends affecting manufacturers and offers insights into the steps that executives can take today to assure their business survives well into the future.

There's change. Trends transforming discrete manufacturing

Dozens of factors contribute to the stress that pervades discrete manufacturing today. Analysis by Infor reveals that the cumulative effect is an extraordinary demand on discrete manufacturers for adaptability, flexibility and efficiency. But, of course, you can't worry about everything. To help out, the Infor team has identified what we believe to be the seven trends producing the greatest stress and change in discrete manufacturing today.

ORDER PATTERNS ARE GETTING TIGHTER – Volatility is clearly not a new concept to discrete manufacturers. But volatility for discrete manufacturers has reached new levels in recent years. More manufacturers find customers taking over the management of their finished goods. This is especially true in retail where the traditional practice of bulk shipping to a warehouse is being replaced by a requirement to break quantities down to the pallet or even smaller units and ship directly to stores. Throw in expectations that manufacturers adapt quickly and efficiently to order cancellations, push outs and sudden obsolescence and you have an order of magnitude of even great volatility.

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The volatility can get even more extreme for businesses further upstream in the supply chain. For example, AMR Research cites a "bullwhip effect" in the semiconductor industry. Because of where semiconductor companies reside in the supply chain, changes in demand originating with the consumer take time to reach

them. The time delay creates problems for many semiconductor manufacturers because they are not equipped to adjust their production quickly enough.[1]

Of course, there are some companies that have built successful businesses exploiting and leveraging order volatility. Setting the pace in this make-to-order world is Dell Computers. Another company on the move is Van Shoes, which in the spring of 2004 began offering consumers an online, make-to-order option for individual pairs of shoes.

DEVELOPMENT TIMES ARE GETTING TIGHTER – The time available to discrete manufacturers for the development and introduction of new products also is getting shorter. This is especially true in the capital goods and electronics industries. In electronics, for example, consumer interest in new products can be fleeting -- less time than it takes to develop, manufacture and distribute the products. Electronics manufacturers often have only a window of a few weeks or months to recoup their investment in a new product. Making matters worse, the electronics industry is so competitive that the window of opportunity for a product can shrink to nothing if another company introduces a more compelling product before your investment is recouped or, worse, before your product is even introduced.

The flip side can be attractive, of course. Companies with best in class development processes can thrive by consistently beating their slower-moving competitors.

ORDER-TO-CASH IS GETTING TIGHTER – Discrete manufacturers and their suppliers are encountering more

[1] *Vinay Asgekar and Bob Parker, AMR Research, October 22, 2003, "Handling Order Volatility in the Semiconductor Industry." Page 1.*

customers calling for the use of automatic payment processes. In this scenario, the manufacturer is paid much more quickly if it has systems in place to accommodate its customers' automatic payment requirements. For those lacking the proper information technology (IT) systems and business processes, there are significant payment delays.

Implementing an automatic payment process can benefit both discrete manufacturers and their customers. For most discrete manufacturers, good cash flow is important, if not a matter of survival. Leveraging IT to automate the submission of invoices can significantly improve cash flow. Failure to make the proper IT investments to implement automatic payment systems can be a dire, self-fulfilling prophecy. Cash flow suffers and, as a result, the unfortunate manufacturer can't make the investment necessary to solve the problem.

It's becoming obvious that **advances in productivity** are no panacea. Productivity can mitigate some of the problems, but not all

PRICE PRESSURES ARE GETTING TIGHTER – Most discrete manufacturers are finding themselves forced to achieve more with less. Competitive pressure in all global markets, combined with general stagnation in Europe and some other areas, prevents manufacturers from raising their prices. At the same time, costs are increasing due to several factors such as labor, health care, raw materials and energy.

It's becoming obvious that advances in productivity are no panacea. Productivity can mitigate some of the problems, but not all. In the U.S., for example, manufacturing productivity more than doubled between 1980 and 2000.[2] Yet, during this period, the percentage of the U.S. economy attributable to manufacturing declined and few would argue that manufacturers are better off today than they were 20 years ago.

Even if the well-established companies of North America and Europe increase productivity, competitors in low labor rate areas such as China can just throw more manpower at the problem and still undercut established companies on price.

GLOBALIZATION IS AN INESCAPABLE FORCE – It is obvious that the days of just focusing on customers, competitors and suppliers in your own country are over for most discrete manufacturers. Many discrete manufacturers are finding themselves up against competition from half a world away for the first time. The U.S. furniture industry is one of many that have gone global in the past few years. The U.S. government reports that furniture and bedding imports surged 93.6% from 1997 to 2002.[3] This helps explain why manufacturing employment in the U.S. is now at its lowest level in 45 years.[4]

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[2] *National Association of Manufacturing, Aug. 4, 2004, Presentation entitled, "The Future of Manufacturing." www.nam.org*

[3] *Amrit Tewary, Standard & Poors, May 6, 2004, "Industry Surveys: Household Durables." Page 9.*

[4] *National Association of Manufacturing, Aug. 4, 2004, Presentation entitled, "The Future of Manufacturing." www.nam.org*

Some industry players are turning the threat from foreign competition into an advantage or at least a coping mechanism. Offshore outsourcing, an especially hot topic in developed countries, is hurling forward at many manufacturers who are moving part or all of their operations overseas. Electrolux, the world's largest appliance manufacturer, is moving the production of refrigerators from Michigan to Mexico, for example.[5]

It's not always a losing proposition for the country sending jobs overseas. James Dyson, the founder and namesake of innovative UK vacuum manufacturer, moved his manufacturing to Malaysia a few years ago. He kept his team of engineers in the UK and within two years of the move met with enough success to hire enough new employees in his design operations to offset the loss of manufacturing jobs.

The Dyson story illustrates that even though globalization is inescapable, traditional manufacturing countries are not necessarily victimized by the process. Many industry leaders also lose sight of the fact that globalization has its own ebb and flow. Leaders and laggards are constantly in flux. For example, China has overtaken Japan in exports to the U.S. and may soon overtake Japan in total exports.

And, with globalization comes new types of uncertainty. The movement of production introduces new challenges to manufacturers, including higher and more unpredictable logistics costs and currency fluctuations.

THE COMPETITIVE FIELD IS CONSOLIDATING – Consolidation in many discrete industries is being driven, in large part, by globalization. Many companies are banking on achieving economies of scale to make them more competitive. There are examples in every industry. Alcoa has purchased Reynolds Metals. HP has purchased Compaq. Whirlpool acquired the Philips NV appliance division in the early 1990s and, in recent years, has purchased appliance manufacturers in Poland and Mexico.[6]

The new competitive dynamics are not restricted to classical horizontal and vertical consolidation. In many industries, new competitive threats are emerging from outside the industry. Metal manufacturers such as steel and aluminum are increasingly competing with producers of other materials such as plastics, glass and ceramics. This trend in materials substitution is a major driver of change.

NEW FABLESS PARADIGM IS TAKING HOLD – Many companies with product brands are pushing production, engineering and logistics responsibilities upstream in the supply chain. Polo, for example, is one of many clothing designers that has chosen to outsource all of its manufacturing. Like others, it is becoming a brand and distribution company. The growth of virtual manufacturers in many industries has accelerated in recent years as some companies with manufacturing, design and engineering experience have sought growth by "pulling" the production responsibilities from companies that traditionally have done their own manufacturing.

This new paradigm has helped to address excess plant capacity in certain areas and industries. It also has driven home the need for excellence in logistics and distribution.

THE DEMAND FOR CONFIGURABILITY IS INCREASING – Product configurability is growing in virtually all industries. From boxes of cereal to huge earth moving equipment, manufacturers are increasingly adopting anengineer-to-order, manufacturer-to-order, configure-to-order business model. The trend is being driven by greater capabilities of IT systems and expectations among consumers and businesses for more flexibility and choice.

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[5] *Amrit Tewary, Standard & Poors, May 6, 2004, "Industry Surveys: Household Durables." Page 5.*

[6] *Amrit Tewary, Standard & Poors, May 6, 2004, "Industry Surveys: Household Durables." Page 11.*

There's pain. Times are challenging for discrete manufacturers

None of the trends pervading discrete manufacturing are making life easier. All put pressure on companies every day to reach new levels of efficiency, innovation and competitiveness. The Infor industry analysis has identified four business pains that we believe are of greatest importance.

MANY ILL-PREPARED TO DEAL WITH NEW RESPONSIBILITIES – As the paradigm shifts for many companies, they are finding themselves ill-prepared to take on new responsibilities. For every company such as Polo that is transferring its manufacturing responsibilities there are dozens of companies upstream in their supply chains grappling with how to quickly put in place new capabilities in production, engineering and/or logistics.

This puts great stress on a company's systems and business processes to make the changes necessary for survival.

EXTREME PRESSURE TO MANAGE COSTS – Discrete manufacturers in mature economies are under siege from emerging Pacific Rim producers who can produce goods more cheaply. These Pacific Rim companies are often hands down winners when it comes to inexpensively producing simple, high volume products. What is not known is if they can produce complex products with the necessary quality and still maintain their price advantage. If you take into consideration the evolution of Japanese manufacturing from the 1960s to the present, it is easier to accept that any advantage of established companies in producing high quality, complex products may only be temporary.

Established companies also are being squeezed by raising legacy costs such as pensions and health care. Raising energy prices also are impacting discrete manufacturers, as are increasing labor rates in some countries such as Germany. The result for most manufacturers is a profit margin in the low, single digits. And at low, single digits there is no buffer.

The upshot for most manufacturers is that they can't raise prices enough to keep up with cost increases or they can't raise prices at all. If you can't pass along higher costs through higher prices, becoming more operationally efficient becomes a matter of survival. This explains, in part, the increased focus on inventory management. When companies in discrete manufacturing have too much inventory, not enough or the wrong inventory, their profit margins can disappear.

HARD TO KEEP UP WITH THE PACE OF CHANGE – The need for innovation is presenting many discrete manufacturers with pains. Products are becoming commodities faster today than ever before, thus putting intense pressure on manufacturers to develop and introduce new products. Faster product obsolescence also contributes to the pressure to innovate. Again, the electronics industry is illustrative. Quoted in the July 2004 issue of Managing Automation, Dr. Eliyahu Goldratt, author of the groundbreaking Theory of Constraints philosophy, says, "Look at the electronics industry. The pipeline has three-to-five months where the lifetime of the product is six months. It would be a fantastic joke it weren't reality."[7]

The boom/bust cycle that faces many discrete industries is another pain that must be managed. The aluminum, steel, heavy equipment and semiconductor industries are among the most impacted. In the semiconductor industry, for example, total sales grew from $7.5 billion in 1992 to $47.7 billion in 2000, as reported by the Semiconductor Equipment and Materials association. Worldwide shipments plunged 41% to $28 billion in 2001 and another 30% to $19.7 billion in 2001.[8]

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[7] *Jeff Moad, Managing Automation, July 2004, "Beyond Theory," an interview with Dr. Eliyahu Goldratt.*

[8] *Richard S. Tortoriello, Standard & Poors, February 26, 2004, "Industry Surveys: Semiconductor Equipment." Page 8.*

All too often discrete manufacturers lack the systems for decision support that deliver the information they need for making faster and better business decisions. These companies don't have the relevant, real-time data they need to avoid costly scrap problems, excessive inventory or missed shipments.

The implications on a company's financial performance can be dramatic.

SUPPLIER QUALITY DIFFICULT TO PREDICT AND MANAGE – Many companies supplying discrete manufacturers are in a precarious financial position. Given how tightly integrated most supply chains have become, a manufacturer who makes a bet on the wrong supplier can suffer grave consequences. When a cash-starved supplier craters under the competitive pressure, manufacturers are left with a gap in their supply chain that can disrupt their ability to meet production schedules and harm their own financial viability.

It's not just a financial consideration. Day-to-day quality level of the supplier's products directly influences operational costs. Failing to work with higher-caliber suppliers delivering higher-caliber products can increase cost of inspections and rejection.

With today's technology, **it's possible to cost effectively put in place an IT infrastructure** that can give any executive the **real-time information needed for maximizing efficiencies** in operations and supply chain management.

There's hope. Attributes for success

Fortunately circumstances for discrete manufacturers are not all gloom and doom. For every developed country, discrete manufacturing constitutes a significant percentage of the economy and it drives the rest. With development exploding in China, India and other emerging economies, global growth of discrete manufacturing is inevitable. Though extremely challenging, there's hope for discrete manufacturers who can seize opportunities for growth. AMR Research projects that discrete manufacturers in 2005 will increasingly turn to IT investments as part of an overall strategy for growth and competitiveness.[9] *(Review full report for revised and/or expanded reference.)*

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Given this trend, the question for discrete manufacturers becomes what should they invest in. Based on its 25 years experience supporting more than 7,500 manufacturing companies worldwide, Infor has identified what it believes to be the critical factors executives should consider when planning their IT strategic direction.

EMBRACE CHANGE – Companies hoping to emerge as leaders or continue in their current leadership role must constantly analyze their operations and innovate. It won't be enough to accept change as inevitable. The real winners will proactively agitate for change. For many established companies, this will mean taking on organizational entrenchment and blasting away the status quo. For smaller, emerging companies it will

[9] *Bob Parker, Fenella Scott, AMR Research, General Discrete Industry IT Spending Profile, 2004-2005: Save on Infrastructure, Invest in Process, August 27, 2004.*

mean not throwing up size as an excuse not to conduct business as if you were a Fortune 500 company. With today's technology, it's possible to cost effectively put in place an IT infrastructure that can give any executive the real-time information needed for maximizing efficiencies in operations and supply chain management (SCM).

For companies unwilling to embrace change, odds are high that they will slip back in their standing or, worse, fade away.

EXPAND YOUR OPPORTUNITIES – Manufacturers must take steps to make sure they are perceived as a trusted supplier. This can be achieved by deploying a modern IT infrastructure to efficiently develop and deliver the right product at the right price to the right place at just the right time.

It can also be achieved through imaginative expansion of what you offer customers. Some manufacturing companies are venturing into new areas of services. Household appliance manufacturer Maytag offers an excellent example of how to creatively expand business. In August 2003, the company launched an organization that services all major brands of appliances, not just its own. In a sense, this is an example of a company selling its products and its knowledge. Like Maytag, every company has a knowledge base. Not every company has tapped into that knowledge base to generate new revenue.

BECOME DEMAND-DRIVEN – The ideal in supply chain management is to have the right supplies or parts delivered at just the moment they are needed in the manufacturing process. Taking this to its next logical step, the right product must be manufactured and delivered to the customer at just the right time and place. Traditionally this has been achieved by stockpiling inventory at the manufacturing site and shipping and holding products in warehouses until they are needed. These days are gone. Discrete manufacturers now must manage their supply chain so it is based on demand from their customers, and their customers' customers.

Successful manufacturers of today and tomorrow will have the IT systems in place to gain visibility into impending demand from their customers and how well their suppliers are positioned to help them meet this demand. Stockpiling inventory and keeping finished goods in warehouses is just no longer affordable.

KNOW YOUR IT VENDOR – A discrete manufacturer can only be successful when it is backed up by a successful and viable enterprise IT vendor. Executives should ask themselves a number of questions when evaluating an IT solution. Does the vendor know their industry? Does the vendor have the expertise to help you envision what your IT needs will be in the coming years? Can the IT vendor back up its long-term vision with the assurance that it has the overall financial viability to be your partner long enough to see that vision achieved?

Another important consideration is the depth, breadth and flexibility of the IT vendor's product line. The ideal IT vendor can deliver an end-to-end solution that meets all requirements and also can deliver one or more point solutions to address more narrow business issues.

It clearly pays to know your IT vendor. For discrete manufacturers any investment in enterprise systems will have a direct and obvious impact on the health of the business. Buy the wrong PC or copier and your business can continue with only minor inconveniences. Invest in the wrong enterprise resource planning (ERP) or supply chain management (SCM) solution and you're in store for a business-threatening situation.

There's a solution: The Infor profile in discrete manufacturing

Infor has been serving the needs of discrete manufacturers for more than 25 years. The company has achieved a hard-won, well-deserved track record of success in Europe, the United States and other regions.

With more than $800 million in revenue annually and growing, Infor is positioned to build on this record of success with a comprehensive, long-term strategy to help its discrete manufacturing customers stay on the right side of the technology curve.

The Infor portfolio of solutions for discrete manufacturers has been developed by experts with deep domain knowledge whose focus is on solving customer's business specific business problems.
Infor solutions address business disciplines that are of greatest value to discrete manufacturers.

CUSTOMER MANAGEMENT – The Infor Customer Relationship Management (CRM) Solution has been developed to make all of your company's interactions with existing and potential customers coordinated and effective. The Infor CRM solution helps manage marketing databases, call centers, campaigns, sales forces, help desks, contact logs and activities and projects and proposals. It is a versatile solution that can be used on desktops, over the Web or on remote laptops. The Infor CRM solution integrates directly into the other enterprise solutions to make important customer-specific data available in real time to the employees who need it most.

EXECUTION MANAGEMENT – Infor's Manufacturing Execution System (MES) solution closes the gap between traditional ERP systems and the shop floor. The solution gives manufacturers advanced planning and scheduling capabilities that are based on real-time data from sales, inventory, strategic planning and other metrics and forward-looking indicators managed by ERP systems.
The Infor MES solution incorporates manufacturing control, finite scheduling, advanced planning and scheduling control, tooling and quality management, and shop-floor data collection. It also interfaces with time and attendance systems and ERP solutions from Infor and other vendors to collect and integrate machine data from the shop floor.

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FINANCIAL MANAGEMENT – Infor's Financials solution provides enterprise-wide financial accounting and budgeting, asset management, costing and value flow, payroll and human resources, cash and credit management, and reporting and analysis tools for financial and management professionals. The Infor Financials solution integrates with other Infor modules and with solutions from other major vendors to automate much of the time-consuming data collection common in finance departments. The Financials solution automates repetitive accounting tasks, allowing your team to focus on high-value activities such as forecasting, planning, compliance and budgeting. To accommodate the global reach of many of today's

companies, the financials solution has the international scalability necessary to account for various national tax regulations and accounting practices, while providing a reliable, apples-to-apples global view of financial performance across an entire enterprise.

LOGISTICS MANAGEMENT – Infor's Warehouse Management and Logistics (WML) solution helps streamline a business operation so warehouse costs are minimized. The WML solution can be set up with actual facility topology, enabling discrete manufacturers to accurately manage shipments and available capacity. The solution is versatile, providing the flexibility to manage a wide range of products from one-ton items to those that are shipped in lots of several thousand.

PERFORMANCE MANAGEMENT – Infor's Performance Management solution incorporates strategic business intelligence, key performance indicators, financial reporting, operational reporting and work flow and alert management into an integrated tool that lets managers set and monitor objectives on a real-time basis. With the Infor Performance Management system for discrete manufacturers, critical information about your business is available instantly, and can be reshaped and exported quickly to meet reporting and analytic requirements. Going beyond spreadsheets and graphs, the solution generates "data cubes" that encapsulate important strategic and tactical information that can be shared with interested parties.

RESOURCE MANAGEMENT – Infor's Integrated Business Management and Manufacturing Control solution gives today's manufacturer the critical enterprise resource planning tools required to survive and thrive in a lean world. The solution incorporates sales planning, quotation and order processing, configuration and variant management, production planning and control, sub-contract management, inventory and purchasing management, environmental regulatory compliance tools, and costing and value flow management. The solution helps discrete manufacturers address the increasing pressure to streamline end-to-end processes by enabling the creation of reliable projections and making it possible to integrate this information into your operations and those of your suppliers.

SUPPLIER MANAGEMENT – The Infor Supplier Management solution helps discrete manufacturers optimize the entire supply chain by accelerating the speed with which accurate, detailed production and procurement information moves within your organization and between you and your suppliers. The solution is versatile and can accommodate a wide range of communications processes.

Conclusion

At Infor, we believe the opportunity outweighs the threats facing discrete manufacturers who think and act strategically. Manufacturers in established regions have endured extraordinary adversities and challenges in the early years of the decade. At the same time, manufacturers in emerging regions have seen many early successes in their entry into the world markets. These emerging companies have combined the advantage of low labor rates with advances in technology to take on some of the most successful discrete manufacturers in the world.

But the evolution of global discrete manufacturing is a marathon. Long-term success will go to the companies who invest in understanding the industry trends, their own inherent advantages and what it will take to prevail.

The Infor team has begun the analysis necessary to start this long-term strategic process and has made the investment in the solutions that can enable its customers to take on the competition and prevail. We stand ready to begin the dialogue with customers to assist them in analyzing and leveraging their inherent competitive advantages.

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