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Emerging 40 Vendors: Recognizing innovation in the global manufacturing enterprise*Kevin Parker, editorial director -- Manufacturing Business Technology, 10/1/2007*

The U.S. manufacturing industries have seized upon the term "innovation" as epitomizing what it takes to survive and thrive in an era of free trade and rapid technological change.

Through increased exports, the manufacturing industries today are contributing big time to the health of the U.S. economy. But as supply chains and markets extend globally, goods makers must constantly evaluate their products and processes to stay ahead of the game.

Moreover, in an age of accelerating change, that change itself must be managed.

Twenty years ago, material requirements planning (MRP) and computer-aided design (CAD) systems were first being introduced.

Today, global corporations like The Coca-Cola Company and BP run vast operations on a single instance of enterprise resources planning (ERP). And some say product life-cycle management (PLM), as a category of solution that includes CAD, will be based increasingly on a single associative data model that will encompass both product and production data.

There can be no doubt that these capabilities will be used in the most advanced manufacturing scenarios. As Anton Huber, a Siemens Automation & Drives board member, said of the Siemens purchase of UGS PLM Software, alluding to Siemens own vast industrial operations, "We ourselves have use for this in our own production plants. After all, you can't outsource locomotives."

If ERP and PLM are the heart and soul of the manufacturing enterprise, then *Manufacturing Business Technology's* roster of the 40 Emerging Software Vendors is the enterprise's life-blood. These vendors are forging the next generation of technology and process innovation.

For proof, just ask anyone who has recently left a billion-dollar software company why they did so. The answer may well be, "There are very exciting things happening in this area, and I want to be part of it, but it's just too hard to do something new in a big company."

Big companies know all about this, which is the reason for the daily drumbeat of acquisition announcements in technology markets. Whereas five years ago software vendors sought to grow to \$30 million to \$40 million in revenues in preparation for an initial public offering, today start-ups tend to be acquired by larger entities sooner in their growth cycle.

When that happens, a few people get a big payout, a company brand becomes a product brand, there's teeth-gnashing at the knowledge-worker level, and presto, the innovative solution now is an integral part of an established system.

Thus, while some of the vendors included in the Emerging 40 list that follows may not be around for the long haul, their products quite likely will be, and this is your opportunity to learn about innovative solutions that will be increasingly prominent in years to come.

The vendors in the Emerging 40 were chosen using this kind of criteria:

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- Identified viable vertical industry niches and delivered the domain expertise needed to serve that industry.
- Formulated emerging software functionality for business or manufacturing process optimization.
- Distinguished themselves from the crowd of mainstream software vendors, for example, with their software distribution model or innovative use of infrastructure technology.

The Emerging 40 address challenges in all four areas that *Manufacturing Business Technology* covers: plant operations, enterprise, supply chain, and product engineering. The listing at right categorizes the solution providers in the same way, and brief descriptions of what's involved also are included.

Of particular note is the wealth of vendors focused on product data and engineering services, manufacturing intelligence, and the widely disparate approaches taken to tackling global supply chain complexity. We hope you find something within the pages that follow that supports a specific business need.

Enterprise management

BigMachines: B2B inquiry-to-order management
CMS Manufacturing: ERP for supply chain-intensive environments
Enhanced Systems and Services (ESS): ERP for project-oriented manufacturers
Firepond: SaaS-based complex configure-price-quote management
Global Shop Solutions: ERP for streamlined operations
Glovia Services: SaaS-based manufacturing ERP
IQMS: Manufacturing-centric ERP
IQS: Enterprise quality and compliance management
Plexus Systems: SaaS-based manufacturing ERP
QlikTech: In memory-based business intelligence

Supply chain management

Astea: Service life-cycle management
ClearOrbit: Supply network orchestration
DemandPoint: Value chain management
E2open: SaaS-based global supply network management
John Galt: Forecasting and demand management
Kinaxis: Supply chain response management
Lead Time Technology (LTT): Supply chain optimization
New Momentum: Supply chain risk management
RedTail Solutions: Integrated electronic trading solutions
ServiceBench: Service life-cycle management
ToolsGroup: Inventory management for distribution-intensive environments

Product engineering

Centric Software: Project and product intelligence management
FullTilt: Product information management
Lattice Technology: 3D publishing and communication
Liquid Machines: Document and email control solutions
Parallel Graphics: 3D visual communications and publishing
Right Hemisphere: Visual product communications and collaboration
SpaceClaim: Engineering 3D productivity tools

Plant operations

Acsis: Manufacturing intelligence
Aprion: Industrial wireless
Apriso: Plant and supply chain management
iBASET: Complex manufacturing and maintenance process management
ILS: Plant/enterprise data-connectivity devices
Incuity: Enterprise manufacturing intelligence
Manuvis: Manufacturing intelligence
Objectivity: Object-oriented database information management
Online Development: Plant/enterprise data-connectivity devices
Parsec Automation: Real-time performance management
Preactor: Advanced planning and production scheduling
Transpara: Mobile, composite KPI software

Making the connection to SAP

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Since its founding in 1996, **Acsis** has worked with more than 600 customers to automate shop-floor and supply chain processes, linking them tightly with SAP manufacturing and distribution applications.

Acsis developed the first device control solution to be certified by SAP's Auto-ID infrastructure platform. Its Data-Link Enterprise (DLE) product serves as the foundation for Acsis Lean Enterprise Suite, built on a service-oriented architecture and supported by tools for creating dynamic workflows, monitoring processes, and issuing event-management alerts.

DLE integrates all shop-floor devices with people and processes across the supply chain, enabling tighter collaboration and coordination of resources. It lends visibility to manufacturing, from receiving through the end of production. Once finished goods leave manufacturing, DLE broadly supports warehouse and distribution functionality.

Earlier this year, Acsis launched Acsis Professional Services in support of the SAP xApp Manufacturing Integration and Intelligence (SAP xMII) composite application to help companies identify and resolve manufacturing and distribution problems.

Leveraging the wireless network

Aprion was among the first to consider the consequences of wireless deployment in the oil & gas, chemical, and power-generation industries. Its Intelligent Operations Network (ION) System is a comprehensive industrial wireless networking system used to monitor, manage, and secure multi-vendor wireless devices and applications.

One particular customer recently integrated two large plants under one communication system using ION, thereby enabling field workers to easily communicate with each other over long distances and in different plant locations using wireless VoIP to enhance teamwork and increase productivity.

This customer also found that installing wireless-fidelity technology (Wi-Fi) throughout the office space and in all conference rooms would enable easy access to the Internet and enterprise applications, and promote better communication with customers.

The end result is the company has reduced costs, enabled field mobility, achieved complete communication between two large plant facilities, and increased business productivity while fostering teamwork and improving customer service.

Adaptive beyond MES

Long at home in the manufacturing execution systems (MES) space, **Apriso** now sees itself more broadly as a provider of highly adaptive, enterprise operations execution systems—or OES. Based on service-oriented architecture (SOA), Apriso FlexNet solutions drive a demand-driven fulfillment strategy across multiple production facilities.

A composite architecture enables fluid configuration to address each plant's unique production footprint, while maintaining support of strategic enterprise processes. Applications support global supply chain and production visibility, maintenance, warehouse, quality, and labor functionality.

FlexNet requires only reconfiguring the SOA-enabled composite applications to support emerging best practices that can then be readily deployed to all production facilities to achieve consistent performance. The SOA-enabled platform easily integrates with other systems—from the enterprise level down to the automation layer—so that information from each plant is visible and available for making global demand-fulfillment decisions based on extended enterprise capabilities.

When downtime isn't an option

Astea's service life-cycle management approach to workforce and asset management warrants attention from companies in industries where downtime isn't affordable, and resource inefficiencies directly impact financial performance. The Astea Alliance suite supports the complete service life cycle—from lead generation and project quotation through asset retirement. Essentially, it integrates business processes for contact center, field service, depot repair, logistics, professional services, and sales & marketing.

Service life-cycle management enables companies to streamline and automate business processes; compress the contract-to-cash cycle; identify incremental sales opportunities and improve revenue recovery; collapse nonvalue-add workflows; enhance resource utilization and reduce downtime; coordinate efforts of sales, marketing, and service organizations; improve compliance with service-level agreements, contracts, and warranties; and synchronize customer touch points.

With these capabilities and out-of-the-box functionality for rapid ROI, it's no wonder Astea's client list is on the fast track to growth.

Highly engineered quoting

Within a few months of Ingersoll-Rand's go-live with the **BigMachines** Lean Front-End (LFE) solution, the diversified manufacturer is reporting an average of 120 quotes per month tendered—with quote cycle time reduced by 75 percent, and order accuracy improvement of 100 percent. Having standardized and digitized the knowledge of experienced sales team members, even junior-level salespeople and distributors are able to generate timely and accurate quotes.

These kinds of results aren't uncommon for BigMachines' customers in the industrial, software & services, medical, and telecommunications industries—namely Caliper Lifesciences, NaviSite, Bottomline Technologies, Colfax, Bandwidth.com, Amicas, and Emerson EGS.

The reason is simple: BigMachines' Lean Front-End solution meets the unique requirements of companies that sell complex products

through multiple sales channels. In fact, LFE gives companies all of the functionality they need to quickly create their own powerful, Web-based selling engine and enable their channels, customers, sales staff, and product experts to collaborate in real time over the Internet.

Beyond business intelligence

Product Intelligence and Project Intelligence enterprise applications from **Centric Software** have roots in collaborative project, product, program, and portfolio development—an approach that combines unique data aggregation with powerful analytics, product data management, and workflow.

While Centric's offerings may not suit all types of manufacturers, the company is developing a formidable following among aerospace, automotive, building & construction, consumer goods & apparel, industrial equipment, and pharmaceutical/medical device manufacturers.

So far, more than 40,000 users trust Product Intelligence and Project Intelligence applications to deliver more than \$10 billion in new products and projects.

Fortune 1000 customers like Bristol-Myers Squibb, Coleman, Emerson, Moen, Hamilton Sundstrand, Siemens, Timex, and Volvo have applied Product Intelligence and Project Intelligence solutions to enable executives and multidisciplinary teams to collect all relevant information for any product or capital program initiative, decide on an appropriate course of action, execute to plan, and assess progress against business goals.

Energizing the supply network

ClearOrbit is making the supply chain hum for 300+ customers with real-time supply chain execution (SCE) and reverse logistics management solutions that extend the reach of ERP solutions from Oracle, SAP, and others. These solutions increase visibility and bolster collaboration and delivery down to the "last mile" of the supply chain.

A major automotive OEM is using ClearOrbit's Purchase Order Collaborator to automate complex materials replenishment fed by more than 1,200 suppliers. Now when purchase orders are generated, suppliers access them in minutes rather than days.

Order nonconformance has been cut by nearly 20 percent, resulting in improved production efficiencies. The system also enables greater visibility into the OEM's payables process, accelerating the order-to-cash cycle with fewer time-consuming reconciliations.

In June, TAKE Solutions, a private software and services provider based in Princeton, N.J., acquired ClearOrbit to form a new supply chain management division with international reach, doing business under the ClearOrbit name.

Customer-focused ERP

CMS offers fully integrated enterprise solutions with comprehensive functionality uniquely suited to manufacturers and distributors operating in supply chain-intensive environments such as automotive, food processing, consumer packaged goods, aerospace, electronic components, metal stamping, and plastics molding.

Robust functionality and advanced management reporting tools enhance a company's ability to monitor and control internal processes and resources. Secondly, CMS Software is more than an ERP solution developer, but rather, a one-stop, turnkey solution provider with an in-house staff of implementation, education, training, support, and hardware professionals.

This is particularly crucial for manufacturers that require a single integrated ERP solution with comprehensive functionality and low, long-term cost of ownership. Because CMS provides a single integrated solution requiring minimal, if any, modification, users experience little of the financial and human resource demands associated with implementing and integrating disparate "best-of-breed" solutions.

Lean operations management

DemandPoint, created in April by the merger of Pelion Systems and JCIT, brings forward a legacy in lean production. The new venture marries Pelion's lean-architected production software with JCIT's education and consulting services built around JCIT's Demand Flow Technology (DFT) methodology for operational improvement.

The synergy between the companies supports a collaborative approach to demand flow manufacturing. In the words of Tony Gorski, former CEO of JCIT and now president of DemandPoint, "JCIT and Pelion come from similar DNA."

JCIT has trained more than 100,000 practitioners at 3,500 companies worldwide in its demand flow methodology. Pelion Systems excels in working with manufacturers with complex operations, including an automotive components supplier it helped accrue annual savings of \$80 million, earning it distinction as a 2007 PACE Award finalists for innovation.

The merger blends deep domain expertise in operational excellence and business process optimization with flow principles for enabling demand-driven fulfillment strategies. Kevin Fallon, former CEO of Pelion, remains at the same post in the new entity.

Global supply chain SaaS

As global companies in the electronics, automotive, telecommunications, consumer goods, and heavy equipment industries seek to fine-tune inventory and order management, demand/supply synchronization, spend consolidation, logistics visibility, manufacturing visibility, and quality management, they increasingly turn to **E2open**.

Boeing, the Chicago-based manufacturer of commercial jetliners and military aircraft, offers a good case study. With 135 structural and systems partners involved in launching the 787 Dreamliner, coordinating the supply chain is a real challenge. Boeing had to ensure all partners would have access to the latest information, as well as visibility into any supplier's ability to meet the delivery schedule.

To resolve the dilemma, Boeing implemented Exostar's Supply Chain Management Solution powered by E2open supply chain software to manage the complete order life cycle and returns process across multiple partner tiers, and track planning schedules, consumption, and replenishment for Boeing. E2open's Software-as-a-Service (SaaS) delivery model and network enabled Boeing to go live with the solution in less than 90 days.

One-stop mixed-mode ERP

Enhanced Systems and Services prides itself on meeting the complex software needs of design- and engineering-intensive products with mixed-mode requirements. Its Finesse ERP solution is based on the Microsoft .NET architecture, yielding a highly flexible solution with 15 core modules supporting traditional ERP functionality, as well as applications for project/contracts/jobs management, engineering management, and field service management.

The company also delivers comprehensive planning, implementation services, and ongoing education. Aided by Enhanced Systems consultants, customers are typically up and running in live production within 60 days. Implementation time is dramatically reduced with the use of pre-configured templates that support best-practice requirements for project-oriented manufacturing.

Finesse ERP is in use at hundreds of sites globally, including manufacturers of factory automation systems, aerospace & defense, transportation, energy and environmental systems. TRW, United Technologies, VT Halter Systems, and Jorgensen Forge top off the Enhanced Systems roster.

Accuracy in quoting and pricing

Business has been booming at **Firepond**, with customer-generated proposals created using its CPQ OnDemand product increasing more than 150 percent over the past year. Driving that growth is the fact that Firepond offers a true multi-tenant, on-demand solution that guides salespeople and channel partners through the product selection, validation, and pricing process.

When using Firepond CPQ OnDemand, salespeople in industries such as discrete and high-tech manufacturing, health care, and software/services can configure products of any complexity, accurately price those products, apply discounts or fees to prepare a quote, and then create a professional proposal in multiple formats that can be printed or emailed to a prospect.

The result is reduced cost of sales for companies of all sizes. What's more, Firepond CPQ OnDemand delivers a rapid ROI via improved order accuracy—that is, 100 percent of submitted orders have accurate specifications and pricing based on customized business rules—as well as quicker proposal generation and high user acceptance.

Perfect product information

The **FullTilt** Perfect Product Suite aggregates and cleanses information from disparate data sources to present what the vendor deems a source of truth for the critical attributes and descriptions of a company's products.

FullTilt is recognized as a leader in the product information management (PIM) market by Stamford-Conn.-based Gartner, "possessing both the vision and the ability to execute in providing leading-edge PIM technology," according to the analyst firm. Gartner believes PIM to be "the key technology that has emerged to help enterprises support their PCDM [product content and data management] efforts." Such technology affords a single accurate view of products—i.e., a solution to what has been until now a major pain point for many organizations.

FullTilt offers a comprehensive master data management solution for all vital product-related attributes and relationships, gathered from sources throughout the extended enterprise and made available to all constituents who need it.

FullTilt's Perfect Product Suite is based on a service-oriented architecture, making it flexible and scalable for enterprises of all sizes.

Streamlined one-system ERP

Global Shop Solutions, a privately held ERP software supplier, was founded in 1976 by Dick Alexander, and ownership has not changed hands in 30 years. It serves as a preferred management solution for companies with between 10 and 500 employees in aerospace & defense manufacturing companies, sheet metal fabricators and machine shops, machine builders, repair facilities and electronics providers, wood shops, medical instrumentation, and store-fixturing industries for good reason. Chiefly, its One-System ERP Solution is a comprehensive enterprise management system that can grow with the size and needs of its customers.

All of those factors figure prominently in the successful use of the solution at Wilshire Precision Products, a North Hollywood, Calif.-based supplier of precision manufactured products.

Wilshire began using Global Shop Solution software in 1985. Since then, it has grown 1,200 percent and uses all of facets of the ERP system. Wilshire credits the system with time savings in looking for parts. It also enables immediate scheduling, and led to 98-percent on-time delivery—up from 60 percent.

Low-cost, "big-company" ERP

Glovia Services launched in October 2006 to transfer the deep domain expertise accrued by Glovia International to a Software-as-a-

Service (SaaS) delivery platform targeting small- and midsize businesses (SMB). The new venture is among the first to offer full manufacturing functionality via SaaS.

The target market has long held great allure for traditional ERP vendors, but system costs and complexity have been barriers to entry. Glovia Services was created to pursue the market with a SaaS-based solution that eliminates large, upfront cash outlays and lengthy implementations while providing proven ERP functionality.

The initial offering of GSInnovate has 30 modules focusing on core manufacturing and financial capabilities—borrowing heavily from the some 70 modules in the Glovia International solution.

When SA Baxter, a New York-based build-to-order hardware manufacturer, went looking for a flexible, robust, and affordable ERP solution, it chose GSInnovate. "We're getting a 'big company' ERP system with a secure technology infrastructure at a small company price," says Scott Baxter, founder and CEO.

Paperless process management

For companies awash in paper—typically those in aerospace & defense, industrial equipment, medical equipment/device, and electronics—an integrated paperless solution for complex manufacturing and maintenance process management such as the Solumina solution from **iBASEt** has a great deal of appeal. Solumina users report significantly improved productivity and throughput, and, in the process, millions of dollars in annual cost savings.

Solumina creates a paperless connection between product engineering, enterprise systems, and the plant floor. iBASEt also provides turnkey solutions by combining Solumina with the implementation, training, and support services needed to make every deployment successful.

Atlanta-based satellite systems supplier EMS Technologies is using Solumina Operations Process Management in its Norcross Defense and Space Systems facility to eliminate paper-based processes and streamline procedures for the shop floor. EMS expects to see enhanced quality and effort of work-plan generation, improved data tracking ability, and more efficient quality measurement data gathering.

Intelligent plant-floor connectivity

ILS Technology has a rich history as a provider of data connectivity products. Originally a development group within IBM's e-manufacturing solutions division, it was spun off in 1988 and then acquired by Park-Ohio Holding Corp., becoming ILS Technology. Its solutions lead to greater precision at every phase of the production life cycle. Focused on cross-platform connectivity, secureWISE combines ILS eCentre software and the ServiceNET virtual private network platform to support global collaborative development teams, tightly linked manufacturing sites, and integrated supply chains.

The deviceWISE software framework enables intelligent and secure connectivity between plant-floor devices and enterprise systems. The drag-and-drop configuration tool provides a simple mechanism for moving data from devices to enterprise databases or systems for use by higher-level applications—with no programming required.

One auto manufacturer was better able to track components "as built," associating them with vehicle identification numbers, and thereby reaping ROI in less than a week by identifying the exact location of a single defective part.

Intelligence now rather than later

Finding the best way to integrate plant automation and enterprise systems data is a tricky business. That's why more than 1,500 customers—ranging in size from \$250 million to \$48 billion in industries such as food & beverage and specialty chemicals—make use of enterprise manufacturing intelligence from **Incuty Software**.

Case-in-point is International Paint, which needed to increase plant output. Rather than expanding plant facilities, the Houston-based company wanted to optimize existing lines. Using the Incuty solution, the company made phase changes to shorten raw material addition times, improve line speeds, reduce time in quality control, and shorten overall cycle and changeover times.

Incuty integrates silos of data across the manufacturing enterprise to create a foundation for analysis using real-time executive dashboards, key performance indicator monitoring and alerting, and downtime analysis and reporting. The result is exposure to the full value of data locked in enterprise systems via familiar Web-browser and Microsoft Office interfaces that reveal timely, context-rich information—all leading to better decisions.

ERP for the long haul

Growing at a healthy 25+ percent annual rate for the last couple of years, **IQMS** is reporting 35-percent growth to date this year. Those numbers aren't achieved by cobbling together acquisitions or best-of-breed linkages, but by a single-minded commitment to its original vision: providing a fully functional, single-source ERP solution for small and midsize manufacturers.

"We've always been below the radar, but 'single-source' is coming of age," says President Randy Flamm. EnterpriseIQ is the flagship product, offering manufacturing, accounting, quality control, supply chain, CRM, and e-business as one integrated core product. One of its most popular new modules is a real-time wireless production monitoring module that feeds production data from the shop floor via a mesh network of radio transmitters for continuous production updates on parts created, production time, downtime, rejects, and finished products.

IQMS serves 400+ customers worldwide in repetitive and discrete manufacturing, and enjoys an exceptionally high customer retention rate of 98+ percent.

A model for integrated quality

Eaton, Tenneco Automotive, PolyOne, Cequent, Baxter, Blackstone Medical, Bio Tissues, Volk Optical, Bonne Bell, and Armour Holdings all know that **IQS** delivers proactive quality management software that doesn't just react to alerts, but eliminates problems.

IQS solutions enable end-to-end quality management from planning and engineering through post-production by linking key quality information throughout the manufacturing life cycle to allow customers to build products right the first time, and optimize traceability, regulatory compliance, and supplier collaboration.

IQS customers report substantial gains, including tens of millions of dollars in documented savings. MTD, a Cleveland-based power tools manufacturer, is using IQS to resolve issues surrounding returned materials by working with suppliers on better-quality production. Fact-based nonconformance management systems and supplier scorecards allowed MTD to recover \$6 million in the first six months of the program. All scorecards and metrics were easily defensible, so MTD and its suppliers focused on solving problems, not debating data.

Consumer-driven forecasting

John Galt Solutions, named after a great iconic character in American fiction, offers forecasting and inventory management solutions for consumer-driven, midmarket supply chains. Its supply chain experts promote the company's "Walk, Drive, Fly" methodology perfected in working with more than 5,000 customers to achieve supply chain performance excellence.

The "Walk" phase is powered by John Galt's ForecastX Wizard, which determines which products can be statistically forecast and managed, and which cannot. The Atlas Planning Suite powers the "Drive" phase with automated forecasting and management of exception through collaboration with sales and customers. "Fly" extends the process out to the consumer.

John Galt helped Liberty Hardware increase forecast accuracy from 60 percent to 85 percent, and raise customer-service levels from 95 percent to 99.8 percent. Proclain Hydraulics slashed forecast error from 15 percent to 5 percent, netting significantly reduced inventory, while on-time delivery went from 78 percent to 99.7 percent. And Hasbro raised forecast accuracy from 20 percent to 80 percent, and now provides customer-service fill rates at 99.9 percent.

A fearless response to change

It's one thing to want to respond to market change, but it's something else altogether to actually possess that capability. More than 50,000 users in aerospace, automotive, ship-to-retail, electronics/high-tech, industrial, and medical devices are responding quickly to market changes because they rely on response management solutions from **Kinaxis**. In fact, use of the Kinaxis RapidResponse on-demand solution enables more than 550 manufacturing locations to address constant volatility and variances in demand, supply, product, and daily operations.

Users say RapidResponse enables multi-enterprise visibility to generate answers to changes in global fulfillment networks and supply chains. That's possible because RapidResponse delivers a single view of the truth and real-time collaborative "what-if?" analysis of action alternatives to ensure teams follow the response best aligned with corporate objectives.

Global brand owners and manufacturers Casio, Coty, Honeywell, Jabil Circuit, Raytheon, and Benchmark Electronics rely on Kinaxis RapidResponse to drive operations performance at hundreds of locations by reducing costs, shrinking cycle times, and enhancing customer-service levels.

Designing the extended enterprise

Boeing, Pratt & Whitney, and Honda all turned to **Lattice Technology** in the last year to increase the value of 2D and 3D CAD data across a host of enterprise functions well beyond manufacturing and engineering—from customer support to procurement, sales & marketing, e-learning and training, technical illustration, and quality assurance.

Its flagship Lattice 3D excels in design-intensive industries by compressing 3D data formats using its XVLR eXtensible Virtual World Description Language (based on XML). The ultra-compression technology makes the information more readily presentable to non-CAD users via smaller data size, high-speed data display, and small memory consumption. Lattice also offers applications that holistically present full subassembly and complete views rather than partial ones to accelerate the process and eliminate errors.

Company revenue grew 41 percent over the last year. Found extensively in automotive, Lattice solutions are in use at Toyota Motor Co., an investor in the company. Lattice Technology also announced in August that HitachiSoft has taken a stake in the 10-year-old company as well.

Supply chain optimization

Lead Time Technology (LTT) management draws heavily on its years of experience as former DuPont employees in various management capacities prior to forming LTT in 1998.

LTT brings a "single-minded focus" to supply chain optimization, blending consulting with its proprietary process optimization software to slash supply chain cycles times and correlate daily operational decisions with key financial metrics.

The company offers applications "developed by practitioners for practitioners to achieve world-class operations." Customer engagements typically start with a detailed assessment of operations, followed by recommendations for process change, and custom tailoring of its suite of applications.

LTT has applications for Demand Forecasting, Inventory Optimization, Master Production Scheduling, Distribution Requirements Planning, and Sales & Operations Planning. With today's demand-driven market dynamics, LTT sets the foundation for delivering peak customer service by starting from detailed demand forecasting and inventory planning for every SKU—at every stocking location, every day. Detailed focus on the details is what delivers the results LTT customers want.

Safeguarding intellectual property

While there are many best-practice frameworks—such as ISO 9000—available to optimize various aspects of manufacturing businesses, few provide useful guidance on protecting information.

Founded in 2001 by leaders in the content management and security industries, **Liquid Machines** offers solutions that protect critical business content and audit usage while enabling collaboration. Its document control and email control solutions allow manufacturers to share information securely within any application, and wherever it goes. The solutions also satisfy today's ever-increasing information security regulations, including Sarbanes-Oxley, NASD 2711, and HIPAA.

What that means is manufacturers are able to implement and practice internal mandates for intellectual property (IP) security, product version control, or clinical data protection. Secondly, enterprise-defined policies can be defined and enforced based on employee location, departments, project teams, or the nature of the data to ensure that information—whether it be IP contained in a request-for-proposal, or IP relating to national defense, or corporate strategy documentation—is safeguarded.

Enterprise planning system boost

Manuvis offers what it calls enterprise resource intelligence software. Its FactoryMRI comprises a "universal connector" for accessing actionable intelligence based on data from factory-floor equipment made available to enterprise systems. FactoryMRI improves the planning responsiveness of ERP by feeding accurate status reports on production and capacity so manufacturing can play a more strategic role in meeting demand more profitably.

FactoryMRI connectivity is accomplished without additional costly technology platforms or increases in IT headcount. It eliminates manual data entry—and data error and delay—so production consistently achieves enterprise business objectives. Variance from plan triggers alerts through the solution's Event Notification Manager, which can be configured to broadcast via cell phone, PDA, pager, or other electronic means, prompting immediate remedial action.

The solution makes it easier to identify and track machine inefficiencies for more tightly managed preventive maintenance. Reports cover overall equipment effectiveness, downtime, changeover, scrap, rework, and other performance indicators.

Reducing operational risk

New Momentum extends the notion of supply chain management to embrace risk, focusing on the largest and fastest-growing global supply chains: components for consumer electronics, aerospace & defense, automotive, and other high-tech markets. Its predictive market intelligence (PMI) software blends open market information that is easily accessible with proprietary search technology for perusing and aggregating vast volumes of unstructured data from multiple sources. Coupled with a set of PMI applications, the system enables companies that use electronic components in their products to more proactively manage the volatility and risk of the components market, and extended supply chains.

New Momentum also offers Brand Protection, Partner Compliance, Supplier Interruption, and Asset Valuation applications. A Tier 1 telecommunications company now relies on Brand Protection to address counterfeit and gray market problems that were leeching revenues and brand integrity. In the first 30 days of using the application, the company identified more than 500 instances of unauthorized sales that a previous solution failed to uncover, and targeted corrective action.

Manage voluminous data

For companies that deal with high levels of interrelated data, there's the **Objectivity/DB** platform, which allows users to manage and analyze very large volumes of complex data and ontologies for event and relationship processing within mission-critical applications. Users monitor, analyze, and respond by identifying interrelationships or anomalies using real-time intelligence for predictive analysis and decision support.

The importance of such capabilities is evident when considering the case of **NEC Electronics**, a Santa Clara, Calif.-based division of NEC that operates 16 wafer fabrication plants. It needed a manufacturing control system to manage, monitor, and coordinate processes. Its high standards for product and processes made 24/7 production, precision, and high performance absolute necessities.

Using Objectivity/DB, NEC built what it calls O3, an advanced computer-integrated manufacturing system with pure object technologies. NEC tapped Objectivity/DB's ability to represent and maintain complex lot relations, and ensure consistently high performance.

O3 now enables NEC to increase manufacturing capacity to meet demand 24/7.

Fast-track to factory automation

Online Development lives by its credo to "bridge the gap—make it simple—and break the rules." xCoupler, its flagship suite of

Enterprise Transaction Modules, is comprised of simple appliances that connect PLCs/PACs, actuators, bar-code scanners, RFID controllers, and other devices to higher-level enterprise systems.

The company learned how to do the hard stuff—i.e., engineering interoperability—15 years ago when developing information exchange modules for major factory automation OEMs. That expertise is the foundation of products that allow customers to manage greater connectivity themselves. xCoupler appliances plug into the backplane of stand-alone equipment to provide secure two-tier data communications between devices and higher-level systems without any middleware gateways. The modules eliminate the costly patchwork approach of multi-tier interfaces typically required to transform automation data into enterprise information.

Operating system and application firmware in one device greatly ease interoperability. Online Development counts John Deere, Nucor, Honda, Kraft, and Caterpillar among its customers.

Behind product maintenance

Boeing, Airbus, General Atomics, Pfizer, Loral, NASA, DaimlerChrysler, Volkswagen, ESA, and Ford comprise a diverse bunch, but they do share some common traits. They all cite accelerated time-to-market, improved product quality, organizational efficiency, and lower costs using a solution from **ParallelGraphics** that transforms design data into so-called "visual know-how" for product maintenance and training.

Headquartered in Ireland and led by Francis Bernard, founder of Dassault Systèmes, ParallelGraphics' Cortona3D solution feeds design data from CAD, product data management, and enterprise resources management solutions into 3D authoring tools that then integrate visual know-how into product documentation. But it doesn't take a CAD expert to use Cortona3D. An intuitive interface enables people with no 3D experience to create simulations and associated text.

The benefits are significant: e.g., maintenance and training information delivered up to 70 percent faster; development costs of documentation and training reduced; elimination of costly and inaccurate translations; increased productivity and workforce efficiency; and lower costs due to reusing content.

From automation to intelligence

The history of a software start-up rarely progresses "in a straight line. It's not a science," says Eddy Azad, president and CEO of **Parsec Automation**. Already at release 5 of TrakSYS, its flagship enterprise management intelligence (EMI) product, Parsec has sturdy legs. Founded in 1988 as a systems integrator of process automation, it morphed into a packaged application vendor to establish greater differentiation.

TrakSYS is all about morphing data pooled in automation on the plant floor into business intelligence to drive greater asset utilization, throughput, and profitability. An integrated suite of browser-based applications, the system manages the collection and aggregation of data from multiple sources to enable real-time visibility, event-management, and analysis for improving overall equipment effectiveness.

Release of TrakSYS 5.0 earlier this year was timed to support that of Microsoft Vista, with enhancements for greater root cause analysis of bottlenecks; ALERTTrack for proactive messaging and event-alert notification; and SCRIBENet, a data management module for manual sources of data that will lead to a more complete picture of production processes.

Enterprise systems, on-demand

Plexus Online, offered by **Plexus Systems**, combines the capabilities of ERP, manufacturing execution systems, supply chain management, and customer relationship management. Because the solution is Web-based and requires no infrastructure to implement, it enables companies in the automotive, aerospace & defense, medical device, and packaged food processing industries to manage a single facility or a global enterprise, and closely track and manage business and manufacturing operations.

The payback for companies including Avon Gear, FAS Controls, L. E. Borden/Lang Fastener, Microflex Automotive, STAT Medical X-Ray Tubes, United Plastics, Weldaloy Products, and Wrayco Industries range from increased productivity and decreased scrap to reduced total work-in-process inventory.

Interested in more specific results? Consider this: Use of Plexus Online recently enabled a manufacturing enterprise to improve shipping by 84 percent, improve purchasing inquiry tracking by more than 87 percent, improve purchase order entry time by 90 percent, and eliminate one hour per shift through its use of online process control.

Precise planning & scheduling

Preactor is a pioneer in advanced planning & production scheduling (APS), counting more than 1,600 companies in 50-plus countries as customers. Based in the U.K., it formed a business unit in India in 2005 to focus on the burgeoning Asian manufacturing market.

A broad range of functionally configured APS products—from PLite for the basics, to enterprise-level APS with full order-promising capabilities—and rich system functionality allowed Preactor to gain market presence in metals and fabrication, plastics & rubber, machinery & equipment, automotive, aerospace, chemicals, pharmaceuticals, electronics, and electrical machinery.

PC-based, Preactor runs stand-alone or can be easily integrated with other enterprise solutions to provide finite capacity scheduling robustness. Straightforward in conceptual design, it can be customized to meet unique requirements without affecting the core product code.

In today's demand-driven supply chains, advanced planning and scheduling provides intelligence for not only making customer

commitments, but keeping them.

Point-and-click intelligence

QlikTech has more than 6,000 business intelligence (BI) software users in 74 countries, and continues to add an average of 12 customers daily. For anyone not familiar with the vendor's software, QlikView got its name from the point-and-click method of accessing data and information. This next-generation BI solution has all of the features users expect from analytics solutions, with dashboards and alerts, multidimensional analyses, and slice-and-dice views of data. It can be deployed in days, and users can be trained in minutes to get answers in seconds rather than hours.

QlikView analyzes performance and reports on virtually every area of the enterprise—sales (customer relations, sales force, call-centers); supply chain (inventory and warehousing metrics, suppliers, and pricing analyses), finance (consolidated financial reporting, profitability and debt analyses, executive dashboards), and human resources (shift analysis safety incidents and compliance).

Camden, N.J.-based Campbell Soup, a new user of QlikView, is applying the solution toward improved supply chain management, including analysis of corporate data for inventory control and product mix.

High-level B2B in the supply chain

RedTail Solutions' Software-as-a-Service platform supports EDI, B2B collaboration, and global data synchronization (GDS) between manufacturers, suppliers, and distributors; and enabling data sharing with customers and 3PLs. It synchronizes hundreds of attributes for thousands of items listed on purchase orders, invoices, and shipping transaction notices between shippers and customers.

Founded in 2000, RedTail closed 2006 with a 40-percent increase in customers and a 100-percent increase in revenues over the previous year. This year, it also released a solution specifically targeting the unique needs of pharmaceutical customers, supporting price reconciliation and rebates between manufacturers, distributors, and end users.

RedTail has more than 300 trading partner relationships for EDI, GDS, and RFID in the government, industrial automotive, and retail segments. Customers leverage RedTail's technology to maintain strong relationships with their partners and customers to ensure expeditious, cost-effective movement of everything from fresh flowers to engine parts and assemblies for automotive OEMs.

Complex product communication

The mission at **Right Hemisphere** is to enable and protect product life-cycle efficiencies via enterprise product communication and collaboration solutions that optimize global product development, launch, and support processes as an extension of product life-cycle management (PLM) and product data management systems.

Fortune 100 manufacturers of complex products—including five of the top six automotive OEMs and nine of the top 10 U.S. aerospace and defense contractors—use Right Hemisphere solutions to accelerate time-to-market, increase product and service revenues, and lower product communications costs.

Consider Auburn Hills, Mich.-based Chrysler Group—where Right Hemisphere's software plays a vital role in new product launch and support process. The product communication solutions help Chrysler Group reduce the time, resources, and overall cost of bringing new products to market via automated publishing of rich visual product information readily available in CAD, PLM, and ERP systems into common document formats, business applications, and processes for use by stakeholders across the extended value chain.

Integrating service supply chains

Manufacturers that view customer satisfaction and retention as important keys to differentiation need to harness the intelligence surrounding service to make the customer experience one that consistently exceeds expectations. **ServiceBench** offers a Web-hosted application that comprehensively addresses all critical areas of service, starting with managing initial post-sales service calls, as well as field-service scheduling, parts, repair, and warranty management.

The ServiceBench solution seeks to establish the best service possible for the end customer by precisely pinpointing scheduled repair and ensuring that all necessary parts are on hand with the first dispatch to eliminate delays and further aggravation for the customer.

Information captured at the time of the initial call is available immediately for analysis, making it possible to spot trends and proactively reach out to other customers who might experience similar problems. Service information also can be fed back to design and production to mitigate defects before products are shipped. The net results: improved product performance and customer satisfaction—and ultimately, increased brand equity.

3D modeling a novice could love

A lot can be gained by using 3D mechanical design tools, yet the benefits of 3D usually are gained primarily by dedicated CAD specialists. That's all changing with the release of SpaceClaim Professional 2007 3D modeling software from **SpaceClaim**—a company led by Michael Payne, former CEO of Spatial, former CTO of Dassault Systèmes, founder of PTC, and a cofounder of SolidWorks. SpaceClaim gained considerable attention for itself when it assembled a world-class team of executives, product developers, board members, and advisors.

With the release of SpaceClaim Professional, there no longer exists a gap between designers and people in the extended product development team—i.e., suppliers, manufacturing engineers, analysis engineers, and engineering management—who lack access to—or the time to master—a designer's 3D CAD system.

The payoff is that engineers are now able to both focus on their core competencies while benefiting from the use of a powerful 3D modeler that speeds their contributions to the product development process. In the end, that means companies are able to bring higher-quality products to market faster.

Suiting up to be demand-driven

Demand-driven supply networks seek to run as lean as possible. **ToolsGroup** inventory optimization software mitigates the impact of overall demand uncertainty. It starts with tools that enhance the original product forecast, driving greater granular detail below aggregated family or product group demand, and getting down to individual stock-keeping units (SKU). ToolsGroup also enables automated inventory optimization for determining optimal safety stock for all SKU levels across the entire supply chain.

ToolsGroup software eliminates the costs of exception handling that can disruptively spread throughout the supply chain, further amplifying volatility. Its solutions provide demand intelligence and inventory optimization for more than 130 sites in 31 countries in a dozen vertical industries.

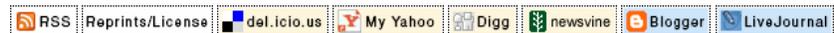
Case-in-point is Krafft, a manufacturer of lubricants and chemicals for the automotive and construction industry, which increased customer-service levels by 10 percent while cutting inventory and improving turns by 25 percent. Krafft now better pinpoints slow-moving inventory, thereby reducing stock by 50 percent.

KPIs and scorecards on the go

Until now, key performance indicators (KPI) and the ubiquity of smart phones, PDAs, and BlackBerry devices haven't been considered complementary, but that's exactly where **Transpara** comes in.

The company, named among the Cool Vendors in Manufacturing in 2007 by Stamford, Conn.-based Gartner, lives up to that billing because its Visual KPI is the only manufacturing intelligence solution that enables device users to easily create and customize composite KPIs and scorecards using data from a combination of existing systems. It publishes those KPIs for instant use by anyone in the organization or supply chain via any handheld or desktop Web-browser.

Transpara customers in the process and utility industries access real-time asset and operating data whenever and wherever they want. One Visual KPI user leveraged its existing investment in OSIssoft's PI System enterprise historian solution along with the workforce's familiarity with cell phones to make vital operations data/KPIs instantly available via mobile devices to technicians and operators in the field. With only 20 users, the customer is already predicting savings upward of \$250,000.



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