



## The business case

Microsoft .NET is the technology infrastructure of choice for midsize manufacturers looking to benefit from today's enterprise systems

By Dann Anthony Mauro

**M**idsize manufacturers—i.e., those with annual revenues between \$50 million and \$1 billion—must compete against the very largest manufacturing enterprises. Those same multibillion-dollar global enterprises often are the midsize manufacturer's most important customers.

How can midsize manufacturers succeed in an era dominated by global brand-name makers of goods?

Strategic initiatives involving lean manufacturing, product innovation, value-adding services, performance management, and rationalized, global production often comprise the means to increased competitiveness and improved customer satisfaction for midsize manufacturers.

Information technology—especially enterprise resources planning (ERP) solutions—serves as a platform for these strategic initiatives, and as a competitive differentiator in its own right.

For years, technology spending by midsize companies as a percentage of revenue lagged that of the largest companies. According to Boston-based AMR Research, average companies spend nearly 4 percent of revenue on information technology, and are looking to increase spending in 2006 by 5.5 percent (See *Figure 1*).

This increase will be even more pronounced for midsize companies, as an AMR survey indicates more than one-third of small and medium-size businesses are implementing ERP, and 71 percent of companies plan to increase ERP spending in 2006.

This is so, says AMR, because many midsize manufacturers still use off-the-shelf accounting software, outdated manufacturing resources planning systems, and a mass of spreadsheets to manage their businesses. These manufacturers, says AMR, need “applications designed for their industry, easy-to-use interfaces, updated architecture, and extended functionality... [for] customer management, human resources, and supply chain optimization.”

### A system of record

ERP solutions are the system of record for manufacturing companies, and the platform for a wide range of integrated business applications. Until recently, the costs—for consulting, licensing, implementation, upgrades, training, and other services—as well as the rigidity of many ERP systems made them unsuitable for many midsize manufacturers.

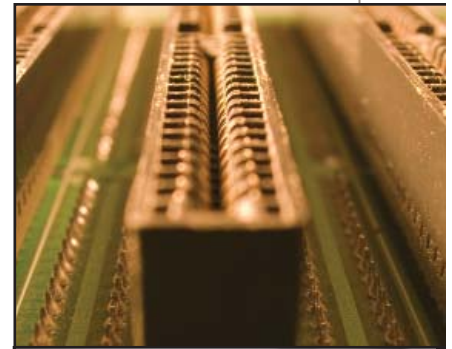
Technology advances, emerging business models, and better understanding of market needs have led to a new generation of ERP systems that deliver needed flexibility to midsize manufacturers at a cost they can afford.

One ERP vendor, Epicor Software Corp., says use of Microsoft .NET as the basis for ERP is key.

Epicor's Vantage, “a Microsoft platform-independent product,” says AMR, “targets discrete manufacturers in make-to-order industries such as electronics, industrial equipment, medical devices, and capital equipment. ... Vantage's release 8.0, with 100-percent service-oriented architecture, includes embedded advanced planning & scheduling, and multiplant management.”

According to Bart Elia, Epicor systems architect, “The .NET Framework allowed us to focus on developing application functionality on top of a robust .NET infrastructure. We didn't have to build the infrastructure, and won't have to maintain it.”

Microsoft .NET is a strategy for connecting systems, information, and devices through Web



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services for ease of collaboration and communication. The technology is integrated throughout Microsoft products, delivering the capability to quickly build, deploy, manage, and use connected solutions.

For manufacturers using .NET-based ERP, computing-infrastructure flexibility translates into business agility, gained by greater ease and less cost in implementing business-process changes. This enhanced agility plays to the midsize manufacturer's greatest strength, which is the ability to react more quickly to market changes than larger, more bureaucratically laden enterprises.

It's also the case that a .NET-based enterprise system is easier to implement and maintain, integrates seamlessly with other systems—including Microsoft desktop productivity tools—and puts users in a position to benefit from other Microsoft technology, including the vendor's portal product, Microsoft SharePoint.

### Under the covers

ACE Clearwater Enterprises, Torrance, Calif., builds complex formed and welded assemblies for the aerospace and power-generation industries. It sought the most current technology to replace a 12-year-old UNIX-based system, and found it in Epicor Vantage.

Says King Lum, ACE Clearwater director of progress, "The UNIX-based system was cumbersome and not user-friendly. The .NET infrastructure gave us the ability to implement rapidly and efficiently. It was easy to install the database server and .NET on the clients. We had the whole infrastructure in place before we began the implementation."

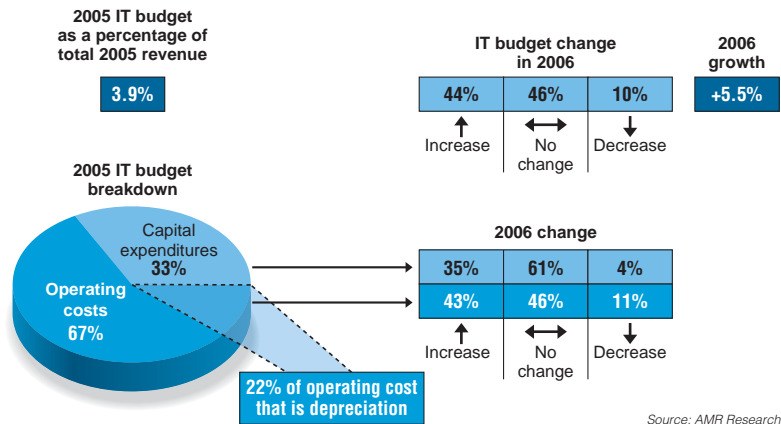
Any software vendor that runs on Microsoft SQL Server can claim .NET-enablement. And a wide range of enterprise and business-application vendors have pledged themselves to the framework. But many of these vendors have simply added Web services wrappers to an existing code base, and thus fail to expose the business logic. And it's in the ability to use business logic to set business policy that a major benefit is found.

Systems built in the .NET environment should accommodate full use of Web services. But not all systems deliver the needed granularity of a true service-oriented architecture. Thus, flexibility to customize or personalize the system isn't available.

As Lum says, "While we found more than 100 enterprise solutions said to be .NET-based, that list got very short once we started looking under the covers."

To react flexibly to customer requirements, for example, supply chain managers must know production status, quality data, and other plant-level information. They also need an easy way to share that information with supply chain partners.

**Figure 1: Discrete manufacturing industry IT budget, 2005-2006**



**IT budget increases by discrete manufacturers indicate confidence on the part of executives that the right use of information technology increases productivity.**

At ACE Clearwater, Epicor's Vantage 8 already has delivered a real-time grasp of work-in-process (WIP) and capacity constraints. "We deployed this system to optimize scheduling, better manage costs, and increase visibility over everything we do—including sales orders, job orders, and purchase orders," says Lum. "That visibility on a real-time basis is a key benefit. Customers constantly call wanting order status."

### More on Web services

"We believe Web services will be the way you interoperate," says Microsoft's Don Richardson, director of manufacturing ISV solutions. "It's the common thread the industry is rallying around."

Web services are pieces of software code, similar to program objects, which can be called and used by other programs or program objects. True Web services are wrapped in a layer of industry standards and communication protocols, allowing them to be deployed across diverse platforms and architectures, and used for sharing information and functionality. Groups of Web services linked together to perform specific functions are called composite applications.

John Hiraoka, a senior VP with Epicor, says .NET programming basically exposes smaller pieces of business information to other systems and processes. "If you look at how traditional applications are built, they are structured around modules," says Hiraoka. "In a .NET environment, the programming is down to the component level, exposing smaller pieces of information—like pricing—as Web services."

This eases integration, says Hiraoka, because "you're now able to see the business flow and information pattern in these granular Web services, and link systems from a management perspective as opposed to a technologist's perspective."

Web services allow an enterprise system user, for example, to easily plug into other .NET systems—such as Epicor's customer

## PROFILE:

**Manufacturer:** ACE Clearwater Enterprises, a Torrance, Calif.-based manufacturer of complex formed and welded assemblies for the aerospace and power-generation industries

**Challenges:** A need for greater shop-floor visibility to provide customer order status requests' and improved reporting and analysis on schedule, quality, and cost trends

**Solution:** The Vantage 8.0 ERP system from Epicor Software Corp., and a combination of ERP reports, Microsoft Excel, and Crystal Reports for business intelligence. Deployment serves three sites, and approximately 70 users. The database is centralized, with access to two sites via T1 lines.

**ERP system platform:** Microsoft Windows 2003 Server, running on a Dell PowerEdge 2800 server with dual 3.0 GHz Xeon CPUs

relationship management (CRM) solution, Clientele CRM.NET—to share information. It makes user interfaces, composite applications, or mobile solutions easy to configure and deploy.

According to Paul Farrell, Epicor VP of worldwide research

& development, “What had been very technical work that might require programmers can now be done by a business analyst. The advantage is that analysts understand the business goals.”

## The day to day

Synovis Life Technologies, St. Paul, Minn., is a diversified company that develops, makes, and markets medical devices for surgical and interventional treatment of disease.

Resident on an NT-based enterprise system from Epicor, “One person ran the system when we were a \$4.1-million company,” says Controller Alex Neutgens. “Two people run it now that we’re a \$32-million company. They spend their time adding to its capabilities, and not simply maintaining the architecture or solution.”

Separating business logic from source code makes Epicor Vantage functionally rich and easy to integrate. But it also makes ongoing system administration and maintenance easier, without the labor intensity commonly associated with customizations and upgrades in module-based environments (For more on customization capabilities, see sidebar, *Sometimes it needs to be special.*)

For ACE Clearwater, its two satellite sites were able to tap into the main system in Torrance without using an extra layer of Microsoft Terminal Services technology. Installation and updates to the system are administered centrally. “No-touch” deployment allows updates and customizations to flow from the server to clients upon login, with no need for interaction at the client to deploy changes.

What’s more, during system upgrades, any customizations—such as those specifying workgroups and security arrangements—persist, with only the base system upgraded.

“Our legacy system had proprietary communications and cabling,” says Lum. “The flexibility of .NET, as well as use of standard Ethernet, made for a low-cost implementation.”

The Windows environment itself contributes significantly to the productivity gains that follow from Microsoft .NET. As Lum observes, “Users now have multiple windows open instead of having to drill down through four or five. It’s very easy to copy

## Midsized enterprise survey

### Microsoft .NET already in wide use as part of an enterprise solution

Midsized discrete manufacturers recently polled by *Manufacturing Business Technology* magazine and enterprise software vendor Epicor Software Corp. see ease of use and wide support by key software vendors as the most important benefits of the Microsoft .NET computing infrastructure, followed by ease of deployment, reduced costs, and openness.

More than 260 corporate, operations, and IT managers completed the survey. More than half of those respondents say .NET already is part of their enterprise computing infrastructure (See Figure 1). And of those using .NET, slightly more than 30 percent say .NET is part of their enterprise solution.

Within their manufacturing operations, these same managers see the most important benefit of .NET being its ease of integration between ERP and third-party solutions, followed by streamlined shop-floor operations, and improved communication with business partners.

Asked if there is a mandate within their company for a particular computing platform, 168 of 262 respondents said yes, with 112 of those saying the designated computing platform is .NET—fully 66 percent (See Figure 2).

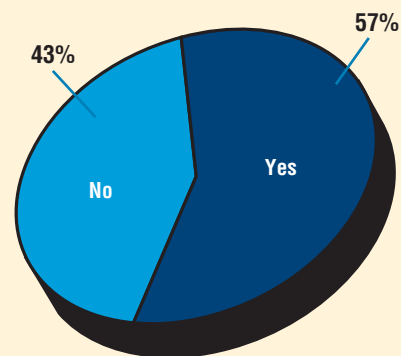


Fig. 1. Do you currently use Microsoft .NET as part of your enterprise computing infrastructure?

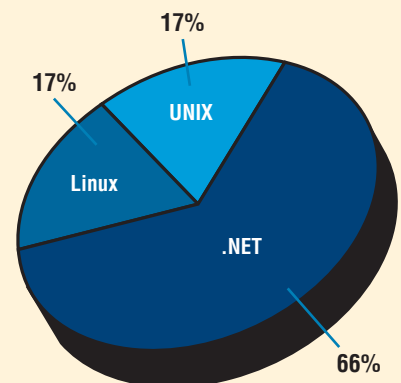


Fig. 2. Is there a mandate within your company for a particular computing platform?

and paste from one window directly into, for example, an Excel spreadsheet.”

Besides .NET, Microsoft offers a technology stack that includes BizTalk Server 2006, Microsoft Office 2003, SQL Server 2005, and SharePoint Portal Server 2003.

Over the next several years there will be increasing operability between ERP systems and the personal productivity tools found in Microsoft Office.

Finally, the flexibility that comes with Vantage 8 must extend beyond the enterprise’s four walls. To do this, manufacturers are making greater use of portal technology, such as Microsoft SharePoint.

More than that, says Erik Johnson, technology director, “Users are beginning to ‘live’ outside the

Sometimes it needs to be special

Use of .NET in Epicor Vantage 8 allows industry, business process, and personalized customization

Epicor’s customers—midsize manufacturers with annual revenues between \$50 million and \$1 billion—are growing companies that find themselves part of global supply chains. The resulting need for flexibility and scalability is one good reason why Epicor remade the Vantage enterprise solution based on a component-level, service-oriented architecture (SOA)—i.e., a Microsoft .NET-based solution.

Epicor says Vantage 8 is the first manufacturing enterprise solution based on a 100-percent SOA that can be deployed either as a smart client or a browser-based interface.

Deployed in an n-tier configuration for partitioning of presentation, business logic, and database—Vantage allows system optimization to suit industry vertical, best business processes, and personal preferences—set globally, or at the log-in user level.

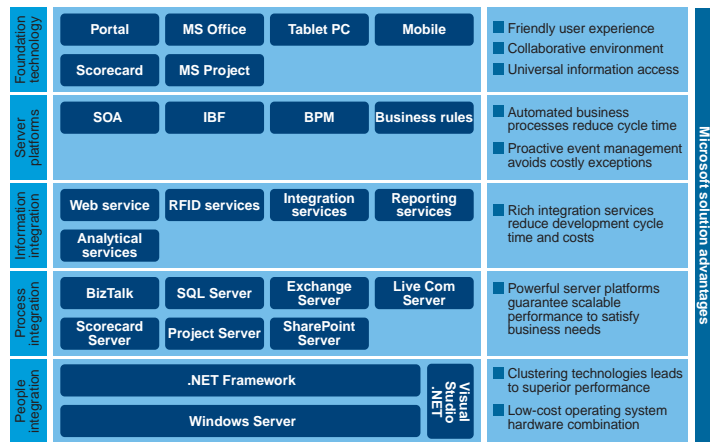
Verticalization is possible because Vantage’s “exposed” business logic allows third parties—such as systems integrators—to tailor the solution to a particular industry, whether that is consumer packaged goods, automotive, or some other.

In the same way, business-process customization becomes the domain of managers and network administrators, allowing even those with limited technical expertise to adjust workflow and build composite applications that are in essence new business processes built from Web services.

An administrator also may globally personalize interfaces based on job functions, or individuals can do so on their own. For example, someone who handles spare-parts order entry may add a capable-to-promise feature to a main work screen. That feature will be available at login, and remains available even after a system upgrade.

Separation of business and presentation logic also makes it possible to configure business logic to be displayed on handheld devices, where users typically need stripped-down interfaces focused on key transactions and data.

Benefits of the .NET Framework



Microsoft .NET is both an infrastructure based on Web services, and part of the larger Microsoft technology stack of servers and tools.

classic application screens, and use tools like Outlook and SharePoint to understand what’s happening in the business. They can then drill across from those tools into the applications as needed.”

In these instances, SharePoint acts as pre-built plumbing in support of needed collaboration. Says Scott Smith, a senior manager with Epicor, “Microsoft provides a secure, collaborative portal infrastructure that we can build on and tie to our applications and role-based, industry-specific content.”

And it is .NET, adds Johnson, that allows Web services integration to pull it all together.

Combining portal technology with Web-services enabled ERP, says Smith, enables manufacturers to streamline almost any supply chain process. In conclusion, he says, “Microsoft technology breaks down barriers.”

And, it might be added, breaking barriers using Microsoft .NET-enabled Vantage 8 increases business agility by means of rich functionality and appropriate customization; ease in implementation, administration, and maintenance of the enterprise system of record; and the kind of supply chain collaboration that is only possible with an enterprise system resident on today’s ruling technology infrastructure for midsize manufacturers of all types.

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