

# MANUFACTURING SYSTEMS

Part II of II, July 2000

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## **B2B Solutions to Command and Control Your Market**

### **Leading Manufacturers Find Real Value in Internet-based E-business Models**

- Best-in-class Application Integration
- Pre-packaged Industry-specific E-business
- Unattended B2B Order Management
- Smart Transactions for Trading Exchanges

# The Shape of Things to Come

*We'll know true demand and what's available-to-promise*



***Point solutions without fulfillment integration won't work***

personalized service, along with the quickest possible delivery of products that are both reliable and affordable.

If it seems as if customers only recently started making such demands, that is because the Internet is now allowing companies to redefine concepts such as the quickest possible delivery time and personalized service. Thus, the Internet has triggered a change in customers' expectations, but their basic desires remain the same.

## **A make-to-order paradigm**

In many industries, heightened customer expectations are forcing manufacturers to adopt make-to-order business models. Companies in these industries can no longer afford to fill warehouses with standard products because virtually all of their customers expect to purchase products with at least some custom features. They also expect near-instant delivery, particularly if they are placing the order over the Internet.

These factors are forcing companies that deal directly with consumers to place even greater emphasis on maintaining close relationships with their suppliers. That emphasis is, in turn, spreading throughout supply chains. In many cases, trading partners have become so close that suppliers are able to begin building products for certain customers long before those customers submit an order. That is because those customers are openly sharing information about the demand for their products with their suppliers.

The desire to collaborate with trading partners is fueling the growth of business-to-business electronic commerce. It also is why major companies within various industries—such as automotive and retail—are coming together to form

trading exchanges, although you wouldn't know that from reading the media accounts of this phenomenon.

The media focuses on how many billions of dollars worth of transactions are expected to flow through these exchanges. It also talks about how much exchange members will save by conducting electronic procurement and reverse auctions. But the executives involved in these exchanges have a different perspective.

## **More than auctions**

"This is not just a purchasing exchange," J. Kevin Vasconi, chief technical officer for Covisint, the auto industry exchange, said during a presentation at a recent AMR Research executive conference. "There are benefits associated with electronic procurement, but they will go away over time. To be successful long-term, exchanges have to integrate supply chain and product development processes." In short, they have to enable their members to conduct collaborative business processes.

Pierre Mitchell, an AMR Research e-commerce analyst, says software vendors that sell e-commerce solutions also heavily promote their electronic procurement and auction capabilities because most of them have not yet built system architectures that can support full-blown collaborative electronic commerce.

"Auctions typically are the first piece of functionality to go up on an exchange because they are the easiest applications to write," Mitchell says.

"Doing supply chain planning on an exchange requires synchronizing data from multiple systems at each members' facilities with data from multiple systems at every other members' facilities. That is a much bigger challenge."

Another thing that cannot come from an exchange is order fulfillment. That takes integration between the front-end, order management functions and the back-end enterprise. The naivete of some of the new e-business vendors entering the manufacturing space is astounding. They may not know how orders are taken, they may have never heard of EDI, yet they intend to revolutionize your processes.

Some enterprise application providers have begun to tackle the challenge of supply chain planning and order fulfillment in an Internet age. Read further in this supplement to find the results of some of those efforts.

A handwritten signature in black ink that reads "Kevin Parker". The signature is fluid and cursive.

KEVIN PARKER, EDITOR

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# Collaborative Applications Power B2B Transactions

*Relationship management key to dynamic collaboration with trading communities*

**W**hen AT&T Wireless went public in April, much of the business media focus was on the rapid ascent and seemingly boundless promise of wireless technology. And although the IPO provides a solid foundation for a company expected to be in the front ranks of its market, analysts looking a little deeper had other reasons for optimism. In particular, AT&T Wireless' information technology (IT) infrastructure reflects an advanced understanding of the new collaborative paradigm emerging as the dominant business model in the Internet age.

The implementation of QAD eQ business-to-business (B2B) applications at AT&T Wireless gives the company a framework for end-to-end B2B transaction management that is fully integrated with the company's back-end Enterprise Resources Planning (ERP) solution. The benefits are significant: AT&T projects that through QAD eQ it will be able to manage its entire order-processing operation with a staff of six—and it expects to maintain this staffing even when shipment levels reach millions of units. Typically, manufacturers shipping at that volume level have an order-entry staff of 50 or more. In addition, the company expects to eventually have no more than 5-7 days of inventory throughout its extended supply chain—making the supply chain a powerful competitive advantage. With the QAD eQ system in place, AT&T Wireless projects 50 inventory turns a year—an almost

unheard-of number in manufacturing, where annual inventory turns are typically in the single digits.

"B2B environments require the coupling of e-sales systems—including flexible order management—to back-end enterprise systems," says Barry Wilderman, vice president of META Group's Application Delivery Strategies. "Vendors like QAD have the vision to provide an integrated solution from raw materials to product delivery."

Implementations such as QAD eQ at AT&T Wireless are indicative of how business applications are evolving as the Internet transforms the fabric of commerce—be it local, regional, or global. The advent of e-business has led to a new paradigm that extends beyond the enterprise and traditional trading partners to market communities that reside, virtually speaking, on the Internet. In this environment, the applications needed to compete go beyond real-time transaction reporting and mere information access to dynamic collaboration. Supply chains give way to flexible trading communities—and in these communities, having an open bridge between front-end customer-facing and back-end fulfillment systems is essential. The potential gains, as can be seen at AT&T, are tremendous.

## A New Class of Applications

QAD eQ is one instance of a new model for business applications. GartnerGroup, Stamford, Conn., calls the model

*'Manufacturers and distributors using Java-enabled QAD applications have an open, flexible framework for connecting their applications to different types of users, other business applications, and the Internet.'*—Sun Microsystems

Collaborative Commerce; **AMR Research** calls it Enterprise Relationship Management (ERM); **Forrester Research** refers to it as eRM, emphasizing its Web-centric structure; META Group says that this is “the new ERP.” Whatever nomenclature is used to describe this new class of solutions, it’s clear that relationship management is at its core.

According to Gartner, these applications will allow enterprises to deliver greater value to customers by synchronizing and optimizing events and activities among a dynamic set of business partners—and by enabling dynamic, recombinant business process execution driven by conditions of supply and demand.

“We really began exploring what kind of applications were needed for this new environment as far back as 1997,” says Pam Lopker, founder and president of **QAD**. “We had a huge global multinational customer base to draw upon, and we worked intensively with elements of that base to define what was needed in this rapidly changing marketplace.”

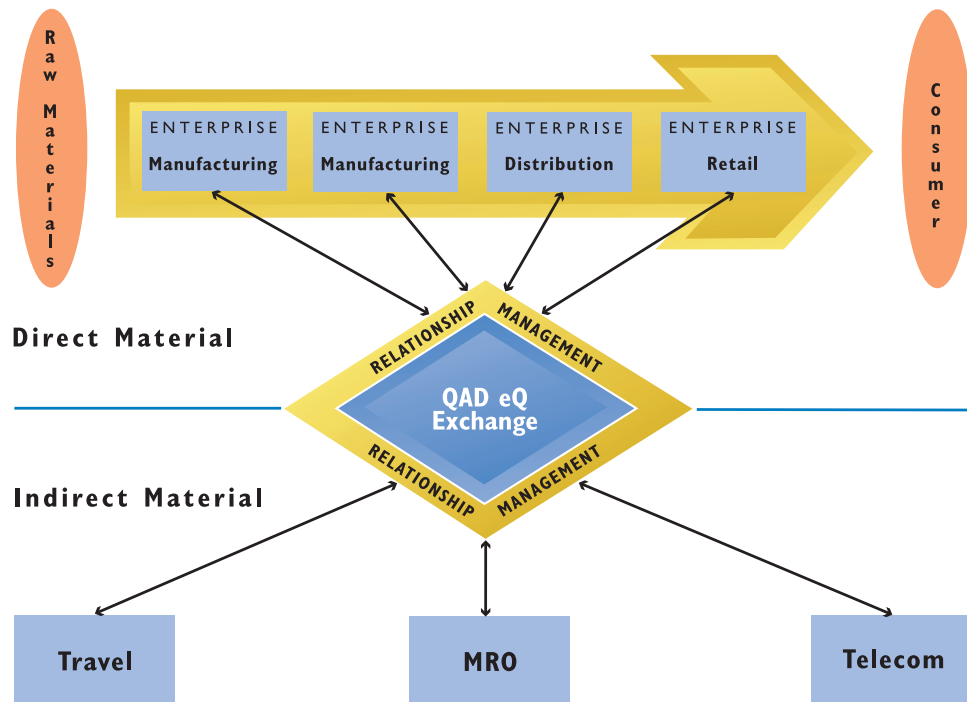
According to Lopker, a number of themes emerged—none more powerful than the need for collaborative functionality.

“These companies had made huge investments in ERP, and what they liked was its tight integration,” says Lopker. “But in looking at the business practices emerging in the Internet-enabled commercial world, by the same token they realized that the problem with ERP was its tight integration.”

A different method of integration was needed—one that was open, allowing enterprises to communicate across multiple enterprise systems. Particularly in the upper and mid-market spaces, corporations found themselves with multiple ERP solutions—and as they looked to collaborative applications and processes, they didn’t want their units to be bound by the restrictions of a single ERP system.

“This led us in the direction of object-oriented technologies as the best means to provide more flexible integration,” says Lopker. At the same time, Java was taking off on both the server and client side, and QAD decided to build its QAD eQ application around Enterprise Java Beans (EJB).

QAD’s decision underscores the importance of Sun Microsystems as a driver of this new class of solutions. In



QAD eQ Exchange offers complete functionality and direct sell-side and buy-side management. Through its relationship management application, it deals with many-buyer to many-seller relationship management by providing many-to-many role management.

addition to Java technology, widespread use of Sun’s smart cards, which carry personalization information and can be placed in applications, is facilitating the adoption of collaborative applications.

### Redefining B2B Relationships

As this evolution advances—as static domains become supply chains that become virtually limitless value networks—it demands that the enterprise infrastructure have an intelligent transaction engine capable of dealing with the proliferation of data at the front end while routing orders directly into back-end enterprise systems.

“Customers need to be able to take the advantages of advanced planning and scheduling systems—specifically, modeling and optimization functionality—and put them into every single transaction,” says Lopker.

This is something beyond the ken of traditional ERP business transactions.

In QAD’s case, it addressed the problem using the same object-oriented technology that allows for open integration, but used in modeling the supply chain and adding supply chain rules to each individual organization.

“When we built QAD eQ around relationship management, we didn’t set up a customer master file or a product master file such as those seen in ERP systems,” says Lopker.

*‘Integrating on-line procurement with back-end enterprise systems delivers enormous value.’ —Commerce One*

“You need to create an organizational profile—that’s the first thing that’s different in relationship management.”

The organizational profile uses traditional vertical and hierarchical structures—“Who’s the parent?” “Who’s the division?” But if an enterprise is to do business with a particular organization, different groups within organizations are going to play roles in the transaction. Those roles are broken up into supply chain tasks.

Lopker gives an example: “WalMart’s buyers are regional. A regional unit of Walmart—say, the East Coast—places orders to Black & Decker that say, from this division I’m placing the orders, but I’m placing them for these local stores. The role of the division in this case is the buyer. The destination is all of the designated stores. But the agent that’s going to pay the bills is Walmart corporate headquarters in Arkansas. With QAD eQ, rules are attached to these organizations that define them according to behavior—and rules are attached to people and products as well as organizations. When the rules are ‘set,’ when the sales order and purchase order come together, the software communicates behind the scenes and confirms or denies the transaction according to the profile.”

In this way the organization allows purchasing to proceed, but the way it buys for one particular product line is different from another product line. In QAD eQ, these differences are designated policies.

“What we are doing is managing the relationships that dictate how a business transaction is done,” says Lopker. “What might change the way it’s done? It could change because of a person, organization, product, or product line.”

When an individual sales order/purchase order comes

together, the relationship management application looks at the universe of information related to the transaction, some of it highly granular and not to be found in a traditional ERP transaction.

“This sophistication of informational content allows both parties to meet their contract and other business goals,” says Lopker.

If a company wants to make sure that products always ship in full truckloads, a policy set into the system makes it a requirement. But, in the case of another product, market share may be the driver—and the product should ship regardless of volume. Another policy assures this process.

“Relationship management personalizes transactions,” Lopker says. “The key is that you can set these up without writing code, because transactions are defined around organizations and rules. The beauty of relationship management is that virtually limitless user-defined associations are put into the rules.”

### Powerful Functionality

Relationship management systems will redefine the breadth and depth of functionality delivered to the enterprise as a means of achieving end-to-end control of value networks. Currently, QAD eQ is the most comprehensive example, delivering:

- Sell-side management
- Buy-side management
- Relationship management (intelligent communication with digital communities and online exchanges)

The indirect procurement side of B2B exchanges is being addressed by trading exchange providers, and QAD is joining

## ■ What to look for in Internet order management

### *Integration with back-end systems should be a priority*

According to **AMR Research**, only four percent of manufacturing orders entered are currently integrated with back-end systems. David Myers, senior director of e-business applications at **QAD**, says that, in the rush to have an e-business presence, many companies are spending huge sums on bolt-on front-end systems that don’t have the requisite integration capabilities to seamlessly connect with their back-end systems. The result is what Myers terms “throw-away systems.”

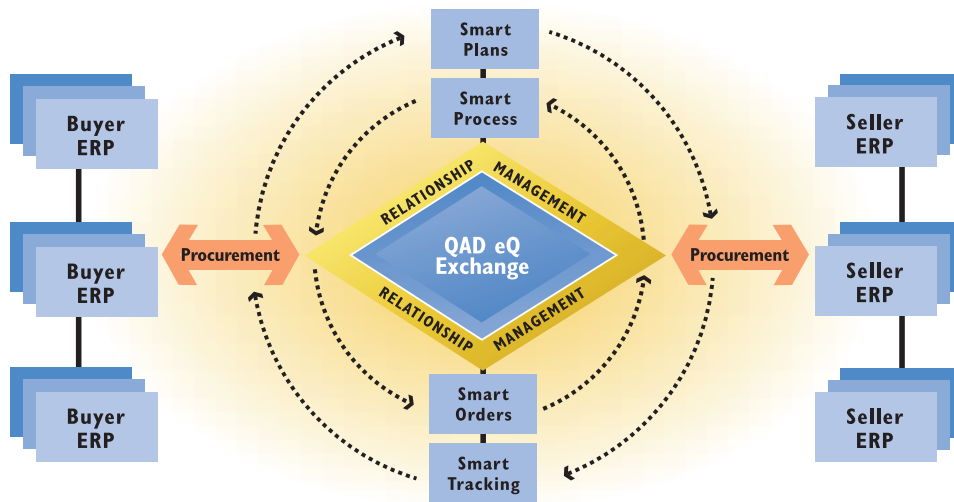
One of the advantages of a system like QAD eQ is that it can operate in both client/server architectures and those built on Internet technologies. And in either case, its open-architected design ensures the front-end/back-end integration essential for competition in the new economy.

Those considering implementing order management systems with e-commerce and



relationship management, but also looking to preserve legacy IT investments, should note the following :

- **Order Capture**— Orders need to be captured either through a conventional client/server user interface for internal users; a browser-based interface for business partners; or received XML messages or batch-oriented EDI transactions.
- **Order Processing**— Orders need to be accepted in a central command and control center where decisions related to fulfillment and sourcing can be made most effectively.
- **Personalization of business processes**— Orders need to be processed according to the preferences of the parties involved (e.g., terms and conditions of commercial agreements) as well as process requirements (e.g., confirmations, invoice copies, and payment flexibility).
- **Organizational modeling**— Orders need to take into account organizational dependencies, corporate contracts, and purchase agreements. Independent transactions for information, materials, and financials are best.



Trading exchanges are becoming increasingly vital to supply chain management. Properly conceived and implemented, they allow manufacturing companies to quickly manufacture and deliver high-quality products to consumers.

forces with Commerce One to deliver access and integration to manufacturers through the Commerce One BuySite e-procurement application and MarketSite Global Trading Portal. However, buying and selling of production materials is just now beginning to emerge. By allowing business partners to exchange detailed, accurate data on a real-time basis, QAD eQ empowers enterprises to approve, route, automate, execute, and account for all transactions pertaining to production goods and services.

“This will allow companies to be efficient in commanding

and controlling digital exchange activities,” says Lopker.

Buy-side activity typically occurs through Web-browser interfaces connected to digital markets or exchanges for MRO procurement and spot market buys. By supporting dynamic, planned, direct procurement of production materials, QAD eQ extends functionality in this arena—providing real-time system-to-system exchange of information that eliminates the time, inaccuracy, and costs associated with manual data entry via Internet browsers. It supports a fully integrated approach to purchase order management that ties process-

es together, from RFQ through contract agreement to final sign-offs on business purchase orders.

“The entire process is simplified, becoming as smooth and automatic as your business requires,” says Lopker. She adds that a manufacturer can view the history of any transaction by customer or order, making management easier and more effective.

Regardless of how an order enters a system—through Web-based B2B or B2C applications, EDI, or wireless communications, QAD eQ Relationship Management

- **Fulfillment**— Orders need to be passed on to where inventory is allocated, picking lists are created, and shipments are recorded, based on organizational and product rules.
- **Replenishment**— Orders need to be generated unattended to replenish inventory locations based on preset algorithms for both push and pull supply chain fulfillment models. Furthermore, the replenishment model needs to include provisions for cost transfers, sales, and cross-country sales.
- **Corporate contracts and purchase agreements**— Orders need to take into account organizational dependencies, corporate contracts, and purchase agreements.
- **RFQ/RFQ management**— Requests for proposal need to be sent to suppliers via the Internet. Incoming responses must be scored against each other.
- **Reverse auctions**— The order management system needs to be able to put out to bid based on demand for a product while also supporting open bids, closed bids, and semi-closed bids over the Internet for commodities and strategic buying. An accepted bid should be automatically converted into a purchase order.
- **Auctions**— The system must provide buyers and sellers with a marketplace where bids can be accepted based on multiple criteria. An accepted bid should be convertible automatically into a purchase order.

- **Integration with enterprise applications**— An e-business application has to integrate with multiple disparate enterprise applications in a global infrastructure. Integration has to be message-based and communicable over the Internet based on standards such as XML, Enterprise Java Beans (EJB), OAG BODS, Rosettanet, Corba, and others.
- **Reporting**— Information should be stored in a relational database model that supports SQL-based reporting.
- **Development ease and flexibility**— When doing business on the Internet, relationships change quickly. The application has to be able to adapt quickly. If the application is built using procedural code based on a data-centric model, changes to the business model are hard to make. The software model should reflect the business model and allow for instantaneous change.
- **Security**— A user is part of an organization and must have individual security authorization. Security should be driven by menu and role as well as by task, field, and content.
- **Internet security**— Applications must support HTTP/S-based transactions so that the application applet can pass through the firewall of enterprises.

Although this list is not exhaustive, it serves as a starting reference point.

framework seamlessly connects all IT system solution components. It delivers the necessary information to suppliers both within and outside of the enterprise for fast, accurate order execution.

### Future Considerations

A major benefit of QAD eQ—and something that management should look to before implementing any relationship management system—is its ability to adapt to change without requiring custom modification. As a business evolves, the system in place should grow to meet new requirements.

Unlike HTML front ends that bolt onto existing applications, QAD eQ uses Java, XML, and IBM's WebSphere suite. Note that the Java objects don't just manage basic database storage and retrieval functions. They also perform

basic business processes like inventory control, accounts receivable, accounts payable, and order management.

"Because of their open systems architecture, QAD eQ applications interoperate with legacy systems and other leading business applications to provide best-in-class functionality," says Lopker. "Unlike other systems, QAD eQ gives manufacturers the flexibility to make the transition to e-business according to a schedule specifically tailored to meet the company's needs."

According to GartnerGroup, enterprises should plan to deploy collaborative commerce applications over the next five years, particularly those heavily dependent on an ability to innovate and serve customers. Enterprises should also plan to extend, open, and secure their application architectures for access to a much wider universe of potential business partners. ■

## ■ Fully automated enterprise

### *AT&T benefits from intelligent order management system*

Imagine the logistical nightmare presented by the highly complex supply chain of AT&T Wireless. The company has hundreds of warehouses supplying a variety of material daily to a large network of technicians. Numerous independent carriers provide transportation. And each of the resultant relationships (factory to carrier; carrier to warehouse; factory to warehouse) is unique in terms of roles, parts and numbering, and rules. In addition, certain key purchased components have long lead times of several months, while customer order cycle times are as brief as one day.

So it was a major challenge for AT&T Wireless to implement a system to manage the flow of information between hundreds of warehouses and carriers, and provide numerous factories with daily replenishment orders, all according to the unique rules for each warehouse. The company wanted to accomplish this automatically, with a minimum of staff, thus saving time and money and improving customer service.

AT&T Wireless, already a user of QAD MFG/PRO software for its factory operations, chose QAD eQ Order Management and QAD Supply Chain Optimizer. The goal was to streamline its supply chain, reducing the many manual operations and individual decisions made each step of the way.

"AT&T's complex network of independent distributors places intense demands on any B2B replenishment solution," said QAD founder and President Pam Lopker. "QAD eQ meets that challenge by enabling AT&T to use a highly collaborative business model to improve their ability to manage a large volume of unique organizational relationships."

QAD met all AT&T Wireless' criteria for achieving a successful solution. It is simple to operate and quick to implement. It is scalable and flexible enough to meet the needs of the company's ever-growing and changing supply chain. It has the ability to integrate with existing applications and to process transactions in a fully automated, lights-out environment, or a manual environment when needed.

AT&T Wireless contracted with QAD Global Services for implementation of the complete QAD eQ B2B applications suite. The QAD eQ Order Management and Relationship Management software now handles AT&T's complex order stream, in addition to controlling the complex interaction between factories, carriers, and warehouses. The QAD eQ system generates orders for each factory daily based on the rules for each warehouse. After each order is processed, it is passed to the individual carriers for delivery.

QAD eQ runs at a central control center as the hub for all data input from the warehouses and carriers. A custom data entry UI was added to QAD eQ for the warehouses and carriers. All access was limited to a secure Web interface.

The completed QAD eQ roll-out, according to independent analysts, shows QAD to be one of the few companies able to deliver end-to-end B2B transaction management solutions that are fully integrated with back-end ERP solutions. As such it will provide AT&T Wireless with a significant payback on its investment. The company now projects that the solution will enable it to manage its entire order processing operation with a staff of only six. QAD eQ will also allow AT&T Wireless to conduct business with only 10 days of inventory, regardless of fluctuations in demand.

With the QAD eQ solution, AT&T Wireless has moved from a logistical nightmare to a supply chain dream.



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# Connecting Within—and Beyond—the Enterprise

*Companies gain maximum value with end-to-end integration*

Today's IT infrastructures have proven to be cumbersome—in some cases downright counterproductive—fulfillment vehicles for e-business. Many companies use separate systems for finance, human resources, and operations. Trying to compete with non-integrated islands of automation is like running a marathon on crutches.

E-business abhors islands of automation. It demands Internet-enabled customer-facing applications fully integrated with back-office order fulfillment systems. Ideally, all back-office systems, whether corporate, plant, or distribution, should link and interoperate with front-office applications. What's more, to become true players in e-business, connectivity must extend beyond the enterprise, giving companies direct connections with supplier, customer, and partner.

Achieving this level of connectivity is a tall order. Experience has demonstrated that no single solution provider has best-in-class application solutions in all critical areas. Indeed, most IT managers at Fortune 1000 companies believe that three to four packaged applications are needed to run today's automated enterprise. They further believe that connectivity outside the enterprise is increasingly imperative.

## Interoperable Applications

Although there is some debate concerning the appropriate degree of integration, most applications need not be integrated at the database level. Indeed, a more flexible and adaptable integration at the applications interface level is preferred. Although the road to achieving interoperability can be hazardous, the good news is that solutions providers now have interoperability solutions based on open architected systems and supported by reliable connectivity tools.

Companies using multiple best-in-class applications are heavily invested in those solutions. In addition to licensing and maintenance fees, they have invested a considerable amount of time and expense deploying these solutions and training

employees. Since many applications are newly installed and just starting to return value, there is reluctance to swap out satisfactory existing solutions with new ones, no matter how promising that may sound. Instead, their focus is achieving more value by integrating existing applications across the enterprise. From a user's viewpoint, top priorities for integration include the following:

- Best-in-class plant-level solutions interoperate with best-in-class corporate financial solutions, such as SAP R/3 or Oracle Financials. Thus, best-in-class applications achieve overall corporate objectives, for a greater total return.
- Front-office applications, such as customer relationship management and sales force automation, interact with back-end enterprise applications. This directly links customer-facing applications with back-office fulfillment for more comprehensive and powerful sales order/customer service solutions.

*'Only companies that have integrated critical business processes can realize the full potential of e-business.'*— *webMethods*

QAD recently surveyed its customer base concerning its need for interoperability. It was found that a sizable number of customers have already implemented basic batch interfaces from their QAD enterprise systems to Oracle, SAP, and other enterprise and legacy systems. Users also need more effective interfaces at the application level. Most interfaces have been largely code-based integrations, which are less flexible and more support-intensive than message-based interfaces. In addition, most connections are batch, uni-directional, point-to-point interfaces that address only the most simplistic interoperability requirements—that is, they can share some data, but are unable to make optimum use of it. Although basic data sharing was sufficient in the past, today's environment demands more—information must be readily available and effectively used for Business Intelligence.

Therefore, interoperability solutions must:

- have loosely coupled interfaces, rather than code-based integrations;
- be designed for flexibility and adaptability to change;
- be equipped with connectivity software and tools that lower on-going support costs;

### Rethinking IT Strategies

E-business has caused many to think about how to glue best-in-class applications together. Suppliers of corporate-level financial or HR applications are not highly motivated to provide this connectivity glue. They would prefer to market monolithic, proprietary solutions that address the corporate level, while pretty much ignoring the operations level. Connectivity is more likely to come from software suppliers with an open architecture strategy—that is, those committed to a best-in-class approach from the beginning.

Connectivity solutions based on industry standards and open architecture have a built-in capacity for adapting to each customer's unique environment and connecting with third-party applications. As a result, these types of solutions are a much better framework for meeting specific customer needs.

The best solutions are those that already include application interfaces to leading third-party product components at their core. Look for solutions providers with comprehensive services able to tailor and deliver the solution to meet unique needs. This product/services approach should incorporate key elements needed for a successful solution including: connectivity engine, industry standard mapping tools and transports, leading third-party adapter products, and complete implementation and integration services.

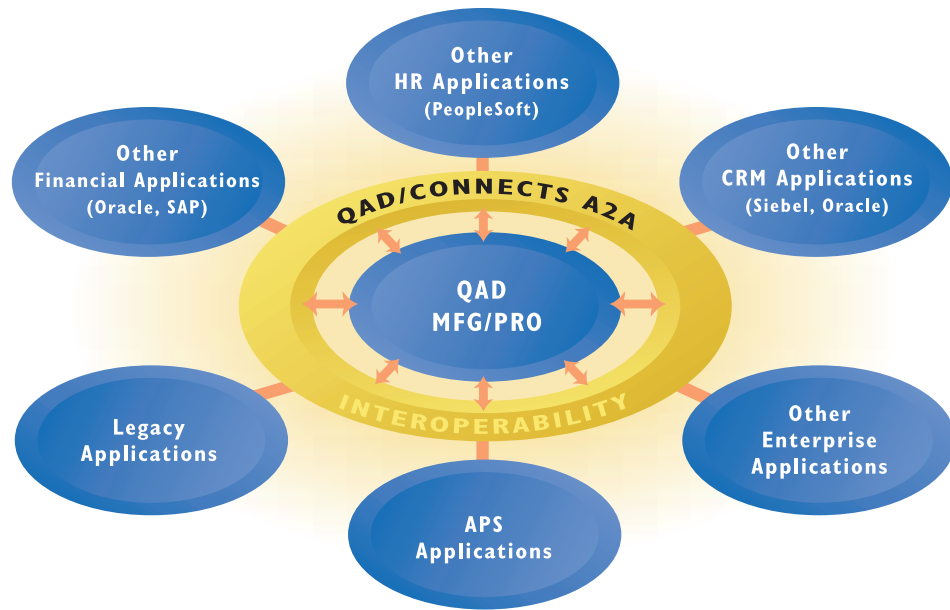
Look for flexible solutions. This means adherence to industry standards and use of messaging to support applications—level integration (as opposed to a proprietary, code-based integration) and both “basic” and “advanced” interface capabilities. Some companies already have a basic batch linkage interface. Simple batch interfaces no longer address the full spectrum of interface requirements. To help meet business needs and allow customers to

respond to a changing environment, a viable interoperability solution must have real-time, two-way, interactive application-to-application connections, as well as simpler batch-oriented interfaces.

### Support for industry interoperability standards

Currently, there is a mix of interoperability interface standards. SAP uses BAPIs (Business Application Programming Interface), or an ALE (Application Linking Enabling) interface with IDocs (Intermediate Documents) flat-file formats. Other vendors—even those that are members of the OAGIS Group, which advocates messaged-based, open exchange of information—promote their own brand of interfacing, along with a set of Application Programming Interfaces (APIs). In light of this, be sure to ask vendors for documentation on standards for interoperability.

In many cases, best-in-class solutions require a third-party



To achieve integrated best-in-class solutions, companies need effective ways to allow disparate applications to work together. The QAD/Connects A2A (application-to-application) solution provides interoperability across the enterprise.

software interface to other enterprise applications (SAP, Oracle, or others) to speed implementation, minimize costs, and ease maintainability. These interfaces typically provide standardized mapping, translation, and message handling into or out of the other enterprise or legacy application. A solutions provider should support leading third-party interfaces to best-in-class applications.

The following checklist outlines what a solutions provider should deliver. Customize the list for your specific requirements, then partner with a solutions provider having a track record for delivering results.

Your interoperability solution provider should:

- have an interoperability solution today, while at the same time positioning you to remain flexible and adaptable to future needs;
- include support for industry standards, such as OAGIS and XML, helping to ensure compatibility with other applications and future connectivity;
- have an interface engine that enables a flexible ‘message-based’ solution, as opposed to a rigid code-based integration;
- support industry leading mapping and transport tools for

maximum solution flexibility;

- offer a solution that comprises both basic and advanced interface capabilities; and
- include a range of global services to ensure a flexible and adaptable solution.

Increasing complexity and diversity of customer requirements limits the ability of any single-vendor solution to fully meet the needs of manufacturers and distributors. An interoperability solution gives companies a cost-effective option that leverages existing IT investments. ■

## ■ Building a value network

### *Ingersoll-Rand links best-in-class applications*

Having a thousand faces may be a valuable talent for a Hollywood character actor. But in business, the last thing you want to do is present yourself in multiple and conflicting ways. Customers value consistency and reliability—signs that a company has its act together.

Which is why IT managers at Ingersoll-Rand of Woodcliff Lake, N.J. decided to provide clients with a single point for placing orders to its manufacturing plants within 140 business units. Consolidating operations through streamlined interfaces was seen as the most effective means to achieve more unified operations that met the company goal of presenting “a single face to the customer.”

But defining this goal did not mean that it was going to be easy to pull off. Right away, Ingersoll-Rand’s IT group understood that the task at hand was going to be demanding.

“We knew we were very diverse from an application portfolio standpoint,” says Steve Carrington, Ingersoll-Rand’s director, information technology. “To achieve an integrated company wide system, we needed 350-plus integration points between applications, including the Oracle platform used for corporate applications.”

Ingersoll-Rand’s integration initiative began with a shared service program supporting finance, HR, and procurement activities. From there, integration would extend to as many systems as possible throughout the \$9-billion multinational corporation, which manufactures specialty vehicles, tools and hardware, air and temperature control systems, and engineered products.

Ultimately, the goal is to connect internal business systems into a larger value network that encompasses suppliers, partners, and customers.

In the past, companies relied on point-to-point integrations, an approach that is poorly suited to the demands of the Internet-driven economy.

“Point-to-point integrations are feasible only if you have a small number of systems,” says Carrington. “If we tried that approach at Ingersoll-Rand, we would be working on integrations for the rest of our lives and they would never be effective.”

Carrington and his team found a more attractive option: interoperability tools that tie enterprise systems to internal and external applications. QAD and CrossWorlds’ jointly provided Ingersoll-Rand with a state-of-the-art applications integration solution. The combination of QAD/Connects A2A, which supports application-to-application interfaces, and CrossWorlds’ middleware delivered an interoperability solution faster, cheaper, and more technically sound than any point-to-point integration.

QAD/Connects A2A included standard APIs that connect

QAD MFG/PRO applications to other applications throughout the enterprise and incorporates industry-leading message-oriented middleware, in this case from CrossWorlds, to manage traffic to and from the applications. QAD/Connects A2A solution supports OAGIS messaging standards and uses XML and Q/LinQ, QAD’s state-of-the-art message handling system.

The QAD connectivity solution was especially important because Ingersoll-Rand has 30 manufacturing sites running on QAD MFG/PRO software—the company’s most extensive installed application.

“We wanted to have a really robust connection from our operations system to our corporate systems, and we wanted to use QAD for the job because they understand the issues,” says Joe Taylor, Ingersoll-Rand’s manager of application support.

QAD also provided tailored connector APIs to Oracle applications, which communicate through Cross Worlds’ middleware.

Taylor likes the fact that once the connections are made, maintenance is easy.

“Once this QAD integration is done, it’s done,” he says. “Then all we have to do is maintain business rules within the CrossWorlds’ tool set.”

With the integration accomplished, Ingersoll-Rand will have front-end procurement integrated with its back-end enterprise systems. The company can then move toward B2B collaborative applications that tap into the systems of suppliers, customers, and channel partners.



# Pre-packaged E-business

*Superior industry-specific solutions backed  
by industry leaders*

**F**ew truly understand the issues facing manufacturers and distributors in transforming themselves into agile “clicks-and-mortar” enterprises. Fewer still offer industry-specific solutions to bring companies closer to their customers and increase the value of their supply chains. And perhaps rarest of all are those who have both the technology and support alliances with key e-business players.

That means PowerSystem—an “out of the box” solution from **QAD, IBM, and Cisco Systems**—is in a league of its own. That’s because PowerSystem combines best-in-class QAD industry-specific manufacturing and distribution software with IBM Netfinity and RS/6000 e-business servers and Cisco networking. The result is a manufacturing and distribution solution that can be implemented quickly and reliably because it is pre-tested, pre-integrated and pre-configured.

PowerSystem now includes MFG/PRO eB, QAD’s latest enterprise solution, loaded with e-business enablers. This advanced version of the product—called PowerSystem eBusiness—also includes IBM’s storefront product, WebSphere Commerce Suite, plus a wide variety of features that support improved connectivity. PowerSystem eBusiness is an end-to-end e-business solution that allows the customer to integrate front- and back-end operations via a “smart” Web storefront.

“PowerSystem is dependable because it combines the strengths of QAD, IBM and Cisco,” says Mike Mohrman, vice president, IBM Global ERP/SCM Segment. “The beauty of the solution is that it is comprehensive, quick to implement, and highly adaptable. Because of its industry-specific functionality, it runs the user’s business the day it goes live, without customization, and it scales to meet growth and new requirements. To ensure maximum reliability, PowerSystem is backed worldwide by global organizations dedicated to customer success.”

PowerSystem includes QAD business software, IBM servers, a Progress or Oracle database, and Cisco middleware and systems management tools. Not just a single business



Caterpillar gained a highly scalable e-business platform through the rapid implementation of the QAD/IBM PowerSystem solution.

application, the PowerSystem is a *complete* out-of-the-box manufacturing and distribution solution. It comes pre-tested, pre-loaded, pre-integrated, and pre-configured. IBM-certified implementation partners guarantee that each PowerSystem solution is implemented on time and on budget.

PowerSystem delivers quick and lasting results because it is configured for specific industries. For example, users in the medical industry receive lifecycle lot traceability with patient/device tracking. Automotive customers get fully integrated EDI import/export per the AIAG model. Consumer products or food and beverage companies receive pricing and promotions applications. And electronics or industrial manufacturers enjoy total mixed-mode manufacturing support (repetitive, work order and batch process).

## **PowerSystem Meets the Challenge**

A wide range of manufacturing and distribution companies are benefiting

from PowerSystem.

Elwood, Indiana-based **ELSA**, a Tier 1 automotive supplier of fuel tanks, exhaust systems and other structural base parts, chose PowerSystem because it met the company’s tough requirements. At the top of its wish list was the need for a flexible system that could expand and change as the company’s needs changed. Advanced automotive functionality was also paramount, especially for inventory control.

With PowerSystem, ELSA got a comprehensive enterprise solution running on the company’s preferred operating system—Windows NT. “PowerSystem proved a good fit for ELSA because it gives manufacturers and distributors the power to

***‘The beauty of the PowerSystem  
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grow their business quickly with a complete, industry-specific solution that is high quality and low risk," said Ron Hitter, IBM's segment executive, Americas Industrial Sector.

During the decision-making process, ELSA found that cost-benefit analysis of various other industry vendors ranked PowerSystem at the top in terms of affordability. The system also matched ELSA's criteria for ease of implementation and automotive functionality.

"As an automotive supplier, it was very important to us to get the industry-specific functionality available with QAD applications and the room for growth afforded by IBM Netfinity servers," says Joe Rauh, ELSA director of IT. We have gained a powerful, reliable, and yet affordable enterprise solution to support our operations."

Other PowerSystem users report impressive results.

When **Stryker Corporation**, a \$2-million multinational company and maker of reconstructive medical and orthopedic devices, based in Kalamazoo, Mich., needed a fast and reliable medical-specific solution for its Latin American sites, PowerSystem was the obvious choice.

TRW served as global system integrator, implementing PowerSystem at five Latin American sites in nine months.

*'For a business to be successful, it has to possess seamless scalability, grow with its own architecture, and make e-business a fundamental part of its strategy.'* —Cisco Systems

the future growth of our newest production site," said Caterpillar IT Senior Consultant Yves Stoupy. "QAD and IBM have an established reputation with us. And with Netfinity servers, we feel we gain IBM's unsurpassed ability to serve the complex needs of larger enterprises on an NT platform that is highly flexible and scalable."

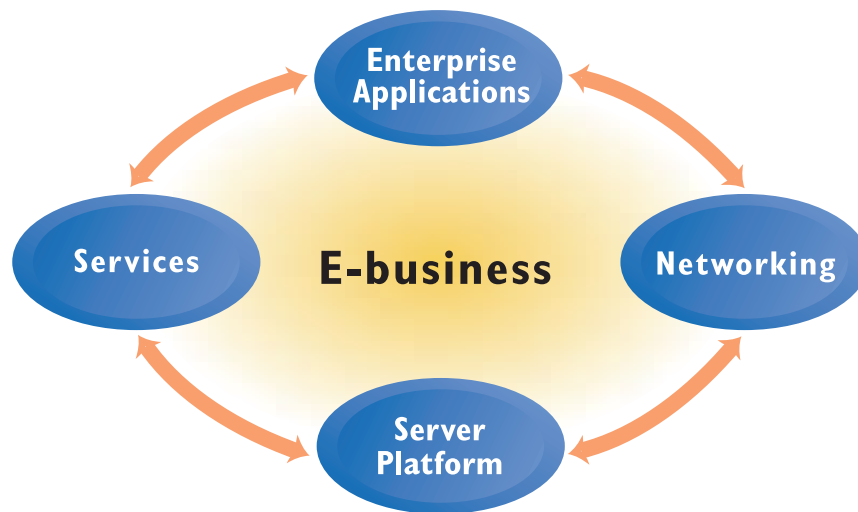
PowerSystem does not require an army of consultants to manage a protracted implementation and customization process. What's more, PowerSystem allows users to cost-effectively add new functionality or extend the hardware platform. QAD's Alliance program of complementary software providers, together with the extensive list of compatible hardware and software available through IBM, allows PowerSystem customers to expand their systems in affordable stages.

#### An ideal e-business platform

Thanks to IBM's state-of-the-art, designed-in Internet capabilities, PowerSystem supports the most sophisticated e-business requirements. According to IBM's Mohrman, this can be a key differentiator for mid-range manufacturers.

"It's becoming clear that e-business tools make it easier for mid-sized manufacturers to compete more effectively with larger companies," he says. "The Internet favors more agile organizations that are willing to try new technologies and new ways of doing business. Since e-business technologies are both affordable and relatively easy to deploy, size doesn't matter. What matters instead is the ability to use e-business tools for competitive advantage."

Companies looking to expand their enterprises to new global markets and to link more effectively to their value chain will benefit from close collaboration between QAD and IBM. Together, they offer a more robust and complete enterprise package, plus a solid roadmap for quick implementation of a solution that supports a company's strategic business initiatives. ■



E-business solutions are only as good as those who provide them. PowerSystem is backed by the industry leaders in enterprise application, networking, Internet-ready servers and e-business services.

TRW also helped Stryker develop a Generic Core Model in five languages. The model was deployed in a synchronized IT environment covering both the Latin American and European regions, comprising 29 main distribution centers and 6 manufacturing plants.

"The support we got for PowerSystem was instrumental in the success of the project," Juan Carlos Roman, Stryker MIS director. "It is very reassuring to work with people

# Market Maker's Formula

*Global leader achieves control of internal and external supply chain processes*

Imagine being able to see for miles after years of having your field of vision restricted to a few feet. That describes the experience of **Firmenich S.A.**, a global fragrance and flavor maker based in Geneva, Switzerland, after implementing progressively more sophisticated business solutions, beginning with a traditional enterprise system and culminating with optimized supply chain and Internet capabilities.

"It was like building a house," explains Vincent Keller, the company's Information System Group Manager for Manufacturing and Logistics. "The foundation was the enterprise system and on top of that we built QAD planning, forecasting, and Internet capabilities. And the higher up we built, the more we could see."

Few large manufacturers have had the foresight to plan, as Firmenich has, a fully integrated, end-to-end Web-enabled system that could potentially provide complete visibility both inside and outside the company.

Firmenich has more than 45,000 products, which makes for a very complex supply chain, and delivers products to more than 120 countries. With factories, distribution centers, and sales offices spread over the globe, sales orders normally go through four or five sites.

Before implementing a comprehensive QAD solution, this is how a typical Firmenich sales scenario played out: A customer in Jakarta ordered 200 kilos of X fragrance. Firmenich's Jakarta sales office placed the order with the Firmenich Asia-Pacific manufacturing hub in Singapore. The Singapore office placed an order in the Geneva headquarters. Geneva sent the sub-assembly to Singapore, which then requested a required product from a chemical division in North America. Singapore assembled the final product and shipped it to Jakarta. Each site took 1-3 days to run its own separate MRP, stretching the process out to 10-20 days.

To stay competitive, Firmenich clearly needed a better way



Firmenich, which manufactures more than 45,000 fragrance and flavor products, has gained global visibility with an integrated supply chain solution.

of managing these processes. That better way came in the form of a series of implementations of QAD Applications, including the MFG/PRO enterprise solution and Supply Chain Optimizer, QAD's advanced planning and scheduling application. The software gave Firmenich comprehensive visibility across supply chains.

Now, a sales order is received, demand is analyzed, and the product shipped, all within one day.

*'E-business is definitely becoming a reality at Firmenich. With QAD applications, we are linking our sites, enhancing the level of communication and collaboration throughout our distributed operations, and synchronizing supply chain activities.'* —Firmenich

## A Forward-looking IT Strategy

Firmenich is one of the largest manufacturers in Europe to use supply chain applications to run its business. The story of its forward-looking IT strategy begins in 1992 when the company decided to replace its sales order processing at the Geneva headquarters. The initial choice of an MFG/PRO solution started Firmenich on the path of a long-standing technological partnership with QAD, whose e-business direction would enable Firmenich to realize its vision of a fully automated supply chain.

After its success in the European sites, Firmenich implemented of QAD's enterprise software, MFG/PRO, globally, including plants

in Asia and Latin America. But while regional supply chains were now connected, Firmenich still needed a way to share data across various databases.

The company began its "Synchro Project," using the QAD APS and Demand Planning solutions to pull its widespread data locations together into one, easily visible whole.

Firmenich's first goal for the APS project was to have the visibility to enable a worldwide view of inventory. The

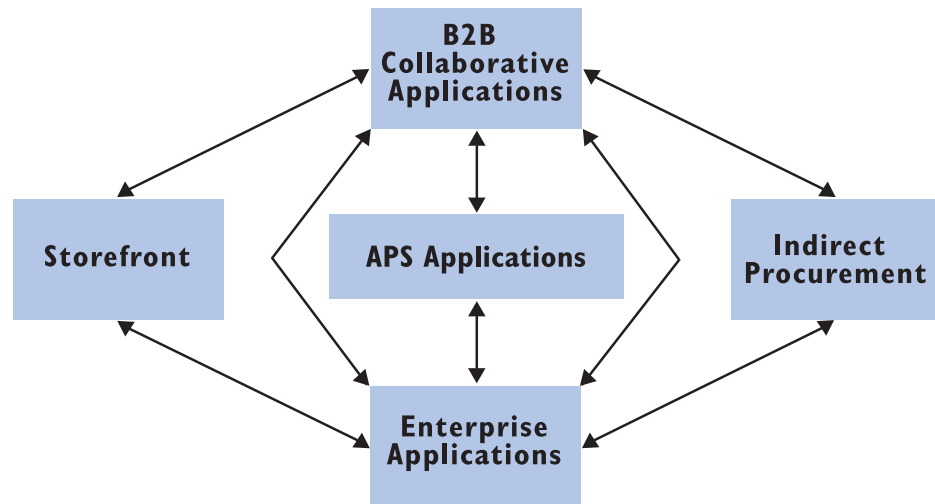
company wanted all activities transferred from the enterprise system to the APS. The result: global visibility of inventory, sales orders, work orders, and purchase orders from all sites and regions.

Within a week, the company was able to define a standard extraction from MFG/PRO and transfer that information to the APS. Within three months, the APS was up and running for each department and site.

“Before, it usually took three months to get the worldwide figures and most of the time they weren’t accurate,” Keller explains. “Now we have this information every day. Plus, we can see all the distribution channels and the entire worldwide inventory, which is something we never had before.”

#### Toward the future and e-business

Despite the sophistication of its current system, Firmenich knows that the future lies with the Internet and e-business. And with QAD, the company can be assured that they have



QAD provides an e-business roadmap that links storefront and indirect procurement solutions with B2B collaborative, APS, and enterprise applications.

the technological underpinnings to connect with their customers on the Web.

“We know that with QAD, Firmenich will have the technology to support business-to-business integration,” Keller says. “Our goal is to know our customer’s product needs as soon as soon as the customer does. That’s a major business advantage.” ■

## Foundation for E-business

### *QAD APS and ERP applications provide Internet-powered backbone for manufacturers*

An e-business solution is only as good as the back-end systems that support it. Which is why a key component of QAD’s total e-business solutions strategy is to provide best-in-class enterprise and optimized supply chain applications that are loaded with e-business adapters. QAD Advanced Planning and Scheduling (APS) applications are fully integrated with QAD’s best-in-class enterprise solution, MFG/PRO eB, and their combined power delivers what industry analysts have called the most elegant enterprise and supply chain solution on the market.

Internet-enabled APS applications include QAD Supply Chain Optimizer, QAD Factory Optimizer and QAD Demand Planner. Using MFG/PRO eB enterprise applications as an e-business information storehouse, QAD APS applications support high-volume transaction environments and help companies gain competitive advantage by quickly addressing business changes and responding to market opportunities.

- QAD Demand Planner lets planners collaborate in producing both demand and supply plans based on historical demand patterns, causal factors, marketing plans and other enterprise knowledge. Through a thin-client Java UI (user interface), it supports collaborative planning within the enterprise and with suppliers and customers.

- QAD Supply Chain Optimizer allows the enterprise to synchronize global purchasing, manufacturing, product flow and distribution while adhering strategic corporate planning objectives. QAD Supply Chain Optimizer supports the achievement of company objectives through dynamic and simultaneous consideration of material and capacity cost constraints.
- QAD Factory Optimizer enables manufacturing managers and planners to optimize manufacturing plans, simultaneously considering capacity, material and customer constraints.
- QAD MFG/PRO eB delivers a best-in-class manufacturing solution that supports the entire business process from the Web-based store-front to the manufacturing floor. MFG/PRO eB supports QAD’s open-standards approach and its APIs create the foundation for seamlessly connecting QAD’s enterprise solution with any other best-in-class solution — both inside and outside your company firewall.

These applications are highly adaptive in real-time. Even non-technical users will make fundamental changes to the software as it is running — a major technology breakthrough as well as an enormous cost savings.

# QAD Partners Ensure E-business Success

## IBM Corp.

The combination of QAD Inc.'s unsurpassed industry-specific knowledge and Armonk, N.Y.-based IBM Corp.'s ability to globally deliver world-class solutions makes for an unbeatable combination. IBM's view of genuine business value is simple: take technically innovative products, such as IBM Netfinity and RS/6000 servers for high-performance enterprise resources planning solutions, and package them with superior network management tools, support services, and financing options. As the world's leading server manufacturer, IBM has the broadest range of enterprise computing technologies in the industry. IBM Netfinity servers are designed to leverage these technologies to deliver the most powerful, scalable, and reliable Intel processor-based servers for any business. And Netfinity systems are backed by the acclaimed service and support users expect from IBM, including 90-day IBM Start Up Support and a three-year, international, on-site limited warranty.

IBM selects business partners like QAD based on their special expertise in vertical markets. Project management follows IBM's proven methodology Worldwide Solutions Design and Delivery Methods—and a highly flexible yet structured approach that ensures rapid and seamless installation.

For more information, contact Gene Lutz ([genelutz@us.ibm.com](mailto:genelutz@us.ibm.com)) at (203) 486-2985.

## Sun Microsystems

SUN Microsystems, Palo Alto, Calif., is the world's leading vendor of the Unix workstations and servers that power the Internet. Sun's revolutionary Java environment is changing the role of the Internet and company intranets all over the planet. Sun's powerful systems are remaking the traditional mainframe-centric corporate world as well. Today, a Sun workstation is much faster, and less expensive, than yesterday's mainframes, performing more than 2 billion calculations in the time it takes to read the last word in this sentence.

Besides its high value, low-cost computing solutions, Sun offers industry next-generation solutions for electronic commerce. Since its inception in 1982, a singular vision, "The Network Is The Computer," has propelled Sun Microsystems to its position as a leading provider of industrial-strength hardware, software, and services that power the Internet and allow companies worldwide to dot-com their businesses. Sun is partnering with QAD Inc. to provide Internet-enabled enterprise solutions. Sun employs more than 30,000 people worldwide in more than 170 countries and can be found on the World Wide Web at [www.sun.com](http://www.sun.com)

For more information, contact Mike Nollet ([michael.nollet@east.sun.com](mailto:michael.nollet@east.sun.com)) at 781-442-0316.

## Cisco Systems, Inc.

Information is a strategic asset that dramatically affects a company's position in today's global economy. Easy and immediate access is required for a business to take full advantage of the information at its disposal. Computer networks are the electronic information highways that unify the world—and the connective backbone of the corporate computing systems that make it possible to manage and disseminate business-critical information. San Jose, Calif.-based Cisco Systems, Inc., the worldwide leader in networking for the Internet, has joined forces with QAD Inc. to provide the business information solutions a company needs to obtain a competitive edge in this world.

Cisco offers the industry's broadest range of hardware products used to form information networks or give people access to those networks. These include electronic commerce and Internet solutions to improve productivity and increase customer satisfaction; prioritized applications traffic to identify mission-critical versus non-mission-critical information and speed it across the network; security features; and technical support and professional services.

For more information, contact Suzanne Calley ([Scalley@cisco.com](mailto:Scalley@cisco.com)) at (408) 527-9397.

## Commerce One

Commerce One is the leader in global e-commerce solutions for business. As the founder of the Global Trading Web, Commerce One enables buyers and sellers around the world to trade in a barrier-free environment and creates new business opportunities for all trading partners. Commerce One offers solutions for companies that want to establish a portal on the Global Trading Web, those who want to host portals for others, and those looking for a comprehensive e-procurement solution and robust return on investment.

The company's products include the Commerce One BuySite e-procurement application and the Commerce One MarketSite Solution, the technology that allows Internet market makers to build open marketplaces and link them to the Global Trading Web. QAD delivers access and integration to mid-market and multinational manufacturers in QAD's target vertical markets through the Commerce One BuySite e-procurement application and Commerce One MarketSite Global Trading Portal. Founded in 1994 as DistriVision, the company was reborn in 1997 as Commerce One and went public in 1999. Based in Pleasanton, California, Commerce One now has over 1,100 employees around the world.

For more information, contact Stephanie Reshel ([stephanie.reshel@commerceone.com](mailto:stephanie.reshel@commerceone.com)) at (925) 520-4377.