IBM

e-business case studies

The Queensboro Shirt Company:

Dressing up the Internet

e-business

Putting e-business to Work

CONTENTS

LIST OF FIGURES

The Company

- Established in 1982
- Based in Wilmington, NC
- Projected 1999 revenues of $7 million
- Projected 1999 revenue growth rate of 30%

The Web Site

www.queensboro.com

- Online store

The Application

- Business-to-business Web-based ordering platform

The Benefits

- 100% payback in 12 months
- Expected total cost reductions of $360,000 in first 12 months
- Greater than 25% of repeat orders now processed over the Web
- 30% reduction in printing and mailing expenses for catalogs
- $12 cost reduction per order for 25% of its repeat orders

The Technology

- IBM Net.Commerce
- IBM Net.Data™
- IBM DB2® Universal Database™
- IBM HTTP Server
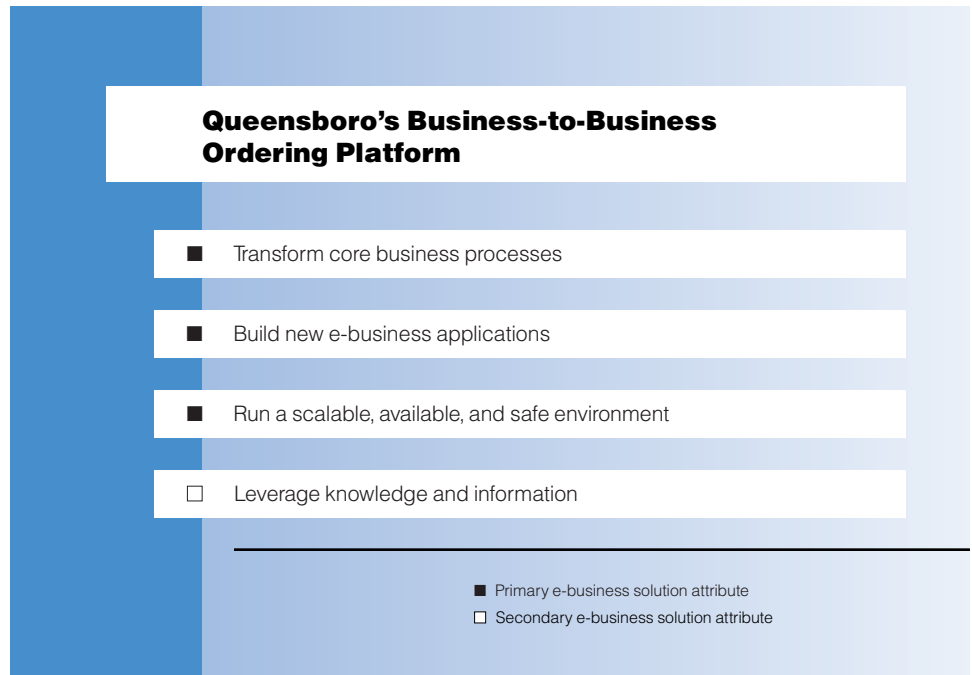- IBM AS/400®

The Business Partner

- Cephas, Inc. (Kansas City, Missouri)

OVERVIEW

e-business Case Study: The Queensboro Shirt Company

Established in 1982, The Queensboro Shirt Company provides high-quality cotton shirts featuring custom-embroidered logos and designs. By targeting the small to medium-sized business market, Queensboro has grown briskly, with sales expected to reach $7 million in 1999, up 30% from 1998.
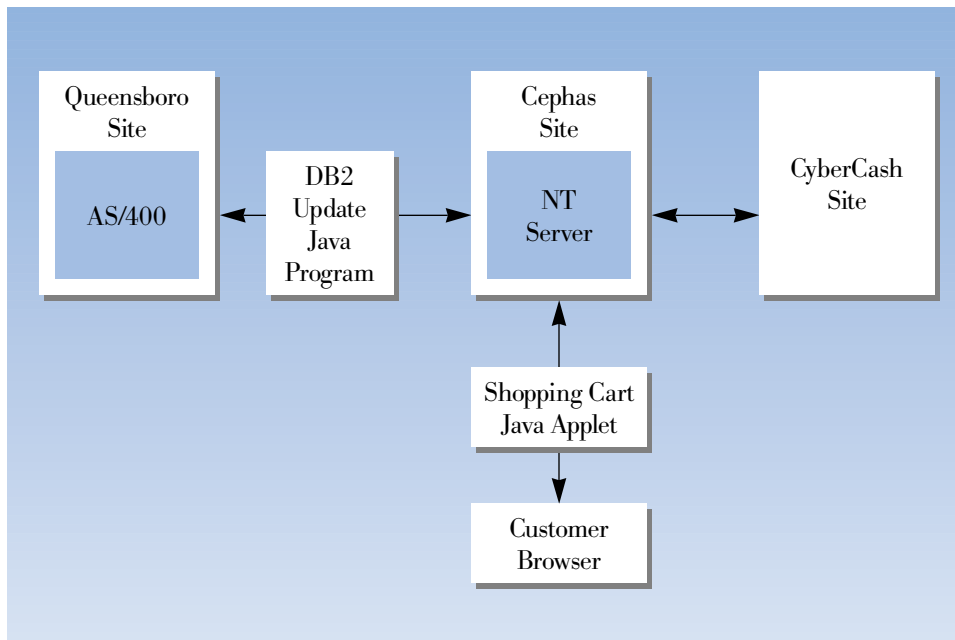
This case study examines Queensboro's use of Net.Commerce, IBM HTTP Server (formerly known as Lotus Domino Go Webserver), DB2 Universal Database and Net.Data to create a commerce platform designed to increase sales to existing customers by providing a richer – and more convenient – shopping experience. With over 25% of repeat orders now processed over the Web, usage of Queensboro's system is already running ahead of its projections.

Queensboro's Business-to-Business Ordering Platform

- ■ Transform core business processes
- ■ Build new e-business applications
- ■ Run a scalable, available, and safe environment
- ☐ Leverage knowledge and information

■ Primary e-business solution attribute
☐ Secondary e-business solution attribute

e-business SOLUTION PROFILE

Queensboro's e-business solution, designed and implemented by IBM Business Partner Cephas, Inc. (Kansas City, Missouri), is a fully transactional, business-to-business platform built around IBM Net.Commerce v3. Other key components of the solution include IBM HTTP Server and IBM DB2 Universal Database (version 5), which now run on a Microsoft Windows NT server located at the Cephas premises, but will be moved to an IBM RS/6000™ model F50, running AIX™. As presently configured, the solution employs SSL encryption and router-based packet filtering to provide site security, but will eventually be protected by a true firewall. Payment and credit card authentication are handled through a real-time link to CyberCash.

Underlying Queensboro's commerce site is an electronic catalog stored within a DB2 database. Like the physical catalog, Queensboro's electronic catalog contains product attribute data, such as shirt color and size. In addition to catalog data, the DB2 database also includes customer data, such as name, address, and ordering volume information. This data is uploaded on a weekly basis (via FTP or e-mail) from an IBM AS/400 server which is located at Queensboro's premises and runs all of its mission-critical functions. To facilitate this update, Cephas developed a Java program that reads the data into the DB2 database and updates records accordingly.

> *"We do pricing in a very unique way, and the Net.Commerce product was really the only product that lent itself to this."*
>
> — Steve Little, President of
> The Queensboro Shirt Company

Source: *The Queensboro Shirt Co., 1999*

Figure 1. Basic System Architecture of the Queensboro e-business Solution

While Queensboro's general Web site is used by both new and existing customers, the Net.Commerce solution resides on the portion dedicated to existing customers. Existing customers using the platform log on through a unique customer account number that they receive in their first contact with Queensboro, via telephone, mail, fax or the Web. From that point on, customers are free to purchase over the Web.

One of the most unique aspects of Queensboro's e-commerce solution is the pricing scheme, a three-tiered system which reflects each customer's up-to-the-minute purchasing volume. Increased purchase volume changes a customer's "frequent buyer status," which in turn triggers a change in the prices charged to that customer. The site also employs a unique Java-based shopping cart that communicates with "servlets" located on the Queensboro server to provide the user with an immediate update of the shopping cart's contents.

Queensboro's payment options include corporate credit cards as well as payment by check. After a credit card order is submitted at the Queensboro site, the system first checks to see that the number input by the user is a valid credit card number. Once it is verified, the system sends credit card information to CyberCash. After approval, Queensboro debits the card, and returns a verification number to the user.
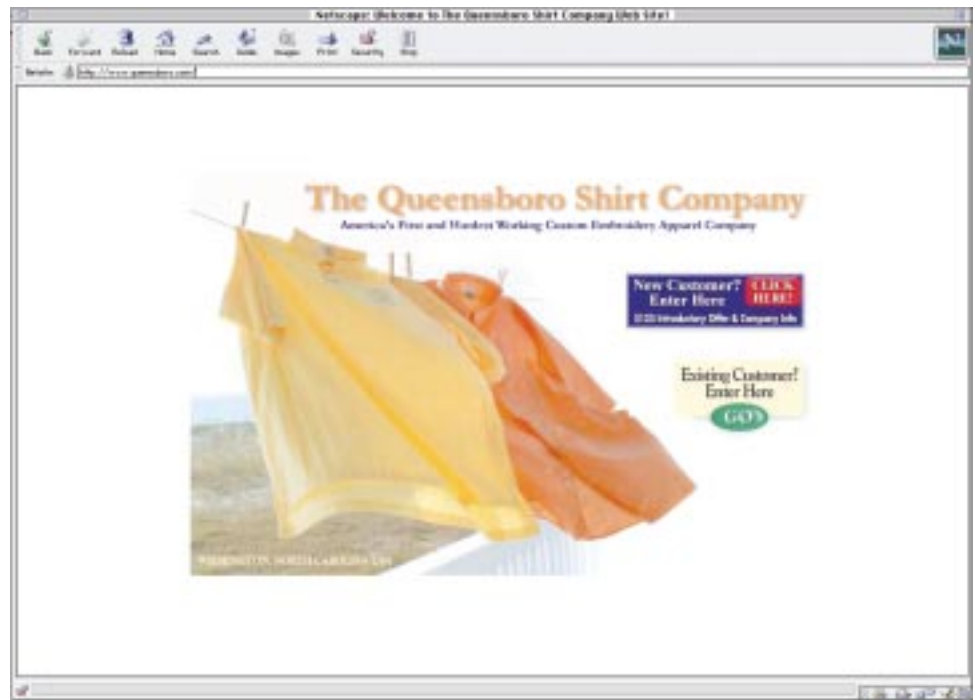
Queensboro expects to reduce total costs by $360,000 in its first 12 months.

PLANNING AND DECISION ENVIRONMENT

While Cephas handled the nuts and bolts of planning and implementation, Queensboro provided the general vision of the solution, notes Adi Rosenblum, a key Cephas software engineer on the project. "One of the refreshing things about working with Queensboro was that they had a clear goal in mind of what they wanted online." One of the key design considerations for Cephas was simplicity. "It was important that users would feel just as comfortable going in online as they would calling the 800 number. It had to be a familiar process."

Steve Little, President of Queensboro, sees the desire to retain customer familiarity as the principal reason Queensboro chose two separate transaction medias for its existing customers and prospects. "We provide separate transaction methods for new and existing customers because it replicates our process in the physical world," says Little. Under its traditional system, Queensboro maintains a set of distinct processes for new vs. repeat customers, with the new customer site dealing mainly with logos, while the site for existing customers focuses on repeat shirt orders. "It was our belief that separating these online would reduce the amount of confusion among our customers," says Little. "We've had great success in the physical world doing it this way, so it made sense to translate this to the online world."

Queensboro's decision to adopt Net.Commerce is linked directly to its desire to eventually migrate the system to its AS/400. The main reasons, says Little, are the AS/400's inherent reliability, as well as an improved ability to integrate with its back-end systems, which now reside on its AS/400. "The stability of an AS/400 is legendary. When we are running our core business processes, we can't be down. With an AS/400 we are not. The fact that Net.Commerce is available on the AS/400 was a very big draw for us."

Another major factor was Net.Commerce's flexible and robust pricing support, which was seen as an ideal solution for Queensboro's frequent buyer pricing approach. "We do pricing in a very unique way," notes Little, "and the Net.Commerce product was really the only product that lent itself to this. Our Web site needed to be able to recognize someone as an existing customer, know how many pieces they bought in the past, tell the shopper how many pieces they have purchased in the past and, therefore, what their pricing is today, and then prompt them with, 'If you buy this many more, you'll get to the next pricing level.' So it's a very complicated thing to do in a Web interface."

When choosing a solution partner, Queensboro sought a vendor who had worked specifically in the catalog business, and had strong experience with Net.Commerce. According to Little, Cephas — which has built close to 30 e-commerce sites since its founding in 1994, including seven Net.Commerce sites — fit the bill. "For one thing, Cephas has targeted the catalog industry. And the fact that IBM recommended them and they had major experience (with Net.Commerce) made it all dovetail together."

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>
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GOALS AND BUSINESS DRIVERS

Queensboro believes that the competitive dynamics of the catalog marketplace have made investments in technology an imperative. According to Little, Queensboro's goals in creating its Net.Commerce platform fall into two general areas: increasing internal efficiency and increasing customer convenience. "We are using the Web to lower our costs and increase our efficiency with regards to our current business operations," says Little. Queensboro founder and chairman Fred Meyers, adds "Speed is also a critical factor in our marketplace. This Web interface moves us much closer to instantaneous customer satisfaction. We'd like to make our customers feel as though they are standing right here in our office."

Little sees the added convenience provided by Queensboro's Net.Commerce solution as a perfect fit for the needs of his key constituency: small to medium-sized companies that buy direct. "People who tend to buy directly are people who are looking for convenience. Convenient communication is one of the primary reasons anyone buys in a direct model, or from a direct catalog. So our Web efforts have been to continue that. When we built this Web site with Cephas, the primary focus for this was, 'How can we make it even easier to do business with us.'"
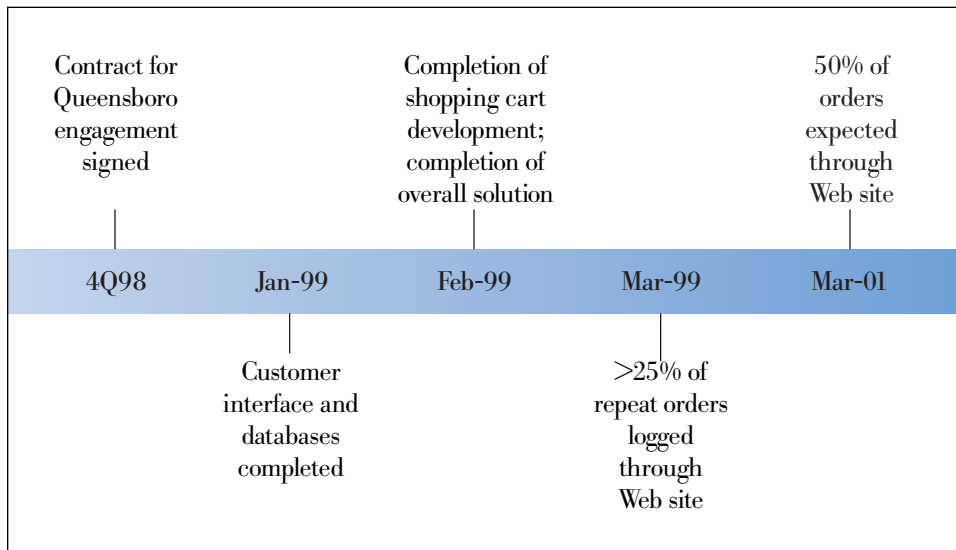
IMPLEMENTATION TIMETABLE AND STRATEGY

According to Cephas' Rosenblum, Queensboro's Net.Commerce solution went from the initial conceptual discussions to implementation in approximately nine weeks. After first meeting with Queensboro in the third quarter of 1998, Cephas spent several weeks in consultation with Queensboro to learn preferences and specifications. A contract was signed in the fourth quarter of 1998, after which the initial graphic design work on the system's interface was begun. By mid-January 1999, the interface design was approved, and the Cephas team had begun implementation of Queensboro's Net.Commerce platform.

According to Rosenblum, the first major step was to work with the product data to build the electronic catalog, a process requiring approximately three weeks. The second step, done in close collaboration with Queensboro, related to the extraction of customer data from Queensboro's AS/400 in a suitable format for Cephas to create customer accounts in the Net.Commerce DB2 database. Cephas' key role in this stage was to use Java to automate the process of posting the AS/400 data file into the DB2 database. At the same time, this Java-based process would − in the course of posting the data − check the DB2 database to see if an account listed in the AS/400 data file was already in the DB2 database. If it wasn't, a new customer account was created.

In late January/early February, Cephas began work on the checkout process, employing both Java applets and servlets. Approximately two weeks later, after the checkout process was completed, the next phase was to use Net.Data to integrate it into Net.Commerce according to the specifications laid out by the systems designers. This process required two to three weeks of Net.Data programming. Work on creating a linkage to CyberCash was performed in parallel with the development effort taking place in the background. The implementation was considered complete at the end of February 1999.

Contract for Queensboro engagement signed		Completion of shopping cart development; completion of overall solution		50% of orders expected through Web site
4Q98	Jan-99	Feb-99	Mar-99	Mar-01
	Customer interface and databases completed		>25% of repeat orders logged through Web site	

Source: Cephas, Inc. The Queensboro Shirt Co., 1999

Figure 2. Implementation Timetable for the Queensboro e-business Solution

"The way Net.Commerce allowed us to put different attributes into all the products, and the way it was designed, really made it easy for me."

— Adi Rosenblum, Software Engineer of Cephas

Rosenblum believes that the Queensboro site represents an excellent example of Net.Commerce being used to put together an implementation in an exceedingly short period of time. "Cephas needed to develop a clever way of storing data such as sizes and colors, but also an easy way for the user coming to the site to choose those colors and sizes. The way Net.Commerce allowed us to put different attributes into all the products, and the way it was designed, really made it easy for me. "I didn't have to create any extra tables, I didn't have to reinvent the wheel, and I could use what was already there, quickly. That was a big plus for us."

Queensboro and Cephas discovered yet another benefit of Net.Commerce midway through the implementation process, when they decided that an "Express Order" shopping cart would be a worthwhile addition to the system. "For customers who already know what they want, the traditional shopping cart paradigm doesn't work very well," says Little, "since they are not really *shopping* — they're try to place an order." To better suit the needs of these buyers, the Queensboro/Cephas team developed a simplified grid-based system, with shirt color on the vertical axis and size on the horizontal axis, that allows users to simply input the quantities of each size/color combination in each cell. The real trick, according to Little, was to provide the ability to order through both the Express Order system as well as the standard "catalog" method within the same transaction. "The fact that this could be enabled in Net.Commerce was a pleasant surprise."

Cephas also reaped substantial development efficiencies by using Java at various points in the implementation. A great example is the shopping cart, which Rosenblum calls a "big applet." He explains, "We could have built that shopping cart a number of ways, including CGI, PERL, etc., but that would have taken us twice as much time in development with the same quality output. The easiest way was to build an applet, because it had the best functionality and Java really provided us the framework to get that done quickly. Using Java in this solution was very intuitive and straightforward." Java proved equally valuable on the server side, mainly to connect to the DB2 database for such processes as weekly updating. "It was really easy to connect Java to DB2," says Rosenblum.

BUSINESS PROCESS CHANGES

Since completing its Net.Commerce solution, Queensboro's business processes have changed dramatically. "When I think about what the Web has done for our business it's kind of mind-boggling," says Little. "One year ago, no one here knew what the Web could do for us as a company. Now we have a tough time figuring what we would do without it." Little notes that the primary process efficiency has resulted from what he calls the rise in "DIY" (*i.e.*, do it yourself) service. "Customers are helping themselves, and they're able to do what *used* to require our representatives. In some ways customers do it better themselves because they can go and visually see what their options are by looking at the merchandise. We can then save our representatives from doing the more routine 24-piece, re-order kind of business."

Under the initial process framework for existing customers, mini-orders were handled by telephone, with Queensboro representatives verbally assisting customers. Once the order was finalized, the Queensboro representative would then enter it manually into an AS/400 running, among other things, a home-grown order processing application. "The process was very costly for us, because of the hand-holding involved," says Little. "A typical phone call could take 20 minutes on a 12-piece transaction."

For Queensboro, the economic costs of telephone-based ordering via a customer service representative are substantial. "We have very high-end folks on the phone, college-educated. They're expensive and they're very good. The Web allows us to move them away from routine tasks and frees them to handle more complex customer issues, thereby increasing our overall customer satisfaction."

While Web-based orders are still manually keyed into the AS/400 under the Net.Commerce framework, Queensboro perceives a major process benefit in the fact that it can now assign this data entry to more appropriate staff. "We're very pleased with the efficiencies that we have gained by now being able to offload the data-entry portion of transaction to other staff members. Soon, we hope to eliminate this need for manual order-entry altogether."

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>
> *— Steve Little*

RETURN ON INVESTMENT

Queensboro's benefit stream from its e-business solution spans several areas, including increased revenues from existing customers, reduced costs, and increased speed and efficiencies. From an investment standpoint, Little sees its Net.Commerce platform as an unambiguous success. "We are confident that, with the amount of money we spent and with the amount of time and energy we've put in, at the present rate of usage, we should be able to see a payback of 100% in 12 months," he says.

According to Little, the success of Queensboro's e-business solution is best measured by the rapid rate of adoption by existing customers, the constituency to whom the Net.Commerce solution is targeted. Thus far, he says, usage is well above Queensboro's initial projections. "The goal for this site was to have a run rate at the end of this year of 20 percent of incoming order volume (*i.e.*, the number of orders received from existing customers). In the month of March, we did almost 30 percent, and April will be very similar." Founder Meyers predicts that Web-based orders will account for half of Queensboro's order volume in two years.

Little also calls Queensboro's cost savings from its e-business solution "substantial," in large part because of its ability to shift ordering from more expensive telephone-based representatives to the Web. According to Little, Queensboro saves approximately $12 per order on 25% of its repeat orders. As the share of Web-based orders grows – to 50% within 2 years, Little expects – these savings will flow directly to Queensboro's bottom line.

Overall Benefits	
Function	**Benefit**
Application Development	Rapid application development cycle time
	Ability to create Net.Commerce solution on NT box and then port to an AIX box, allowing development to proceed without delay
Customer Service/Order Processing	Significant reduction in order-processing costs for existing customer transactions ($12 per order); expected overall savings in first 12 months: $210,000
Catalog Printing and Mailing	30% reduction in costs; expected overall savings in first 12 months: $150,000
Overall Payback in First Year	100%

Source: The Queensboro Shirt Company, 1999

Figure 3. Benefits of the Queensboro e-business Solution

Queensboro has also extended its cost savings and efficiencies into the realm of customer communications. For instance, Queensboro has become more selective in its mailing of paper catalogs, and has instead begun to actively channel customers to its Web site. "We are finding other ways — through e-mail and through faxing — to suggest that customers go to the Web site to place an order, and we entice people to do that." One concrete benefit of this approach has been a 30% decline in printing and mailing costs in 1999.

IMPLEMENTATION ISSUES/LESSONS LEARNED

In constructing the Queensboro e-business solution, Cephas encountered a number of technical challenges that it was able to overcome by applying innovative techniques, such as the use of Java applets and servlets. But perhaps the most important keys to Cephas' success were the inherent strengths of Net.Commerce itself. Take, for example, the issue of Queensboro's unique, multi-tiered pricing structure, which sets unit price levels according to up-to-the-minute ordering volume *within an ordering session*. Says Cephas' Rosenblum: "Applying the pricing scheme at the time of closing the order was simple enough. But the more difficult aspect is seen if users add items to the shopping basket and take items out of the shopping basket. If the pricing has to reflect each – almost literally each – click, that's a more difficult problem, because they could literally move into an upper pricing range and then back down again by removing from or adding to their shopping basket. So it was almost more of a real-time client application that was needed in order for the user experience to be what Queensboro was reaching for."

Another positive lesson learned during the implementation relates to the inherent scalability of the Net.Commerce platform and DB2. Rosenblum notes that when usage of the Queensboro e-business solution grew considerably faster than its initial expectations, system scalability was definitely a concern. "If we had built the system using technology that wasn't scalable, we would have performance issues already, and we would probably already be talking about changing to another software platform."

Rebecca Bunting, Director of Marketing and Sales at Cephas, concurs with Rosenblum on the scalability benefits of the Net.Commerce platform: "I think the great thing is that you can start small and really scale up to a very large site. With the Net.Commerce software, not only does it integrate with Queensboro's AS/400 system in the back end, but it's going to be robust enough to handle whatever Queensboro throws at it. They don't really ever have to start again, unlike a lot of companies in that predicament."

FUTURE PLANS

Going forward, Queensboro plans to step up its Web efforts, and plans to continue actively steering both new and existing customers to its Web site through a combination of direct mail, direct response print advertising, outbound e-mails and ad banners. In terms of its commerce infrastructure, Little notes that Queensboro's near term focus will be on tightening the integration between Net.Commerce and its AS/400. "It is our intent — and the way that the system has been built, and the reason that we went with Cephas — to integrate it with the AS/400."

Queensboro's AS/400 integration plans will proceed in stages, with the next likely to be a dedicated — possibly real-time — connection between the server now running Net.Commerce and the AS/400. "The real benefit here will be integration of back-end systems," says Little, "which would eliminate the need for manual entry, and provide Queensboro with the ability to present more breadth of information to customers through a Web interface." Some examples of this information may include customer order-tracking number capability, as well as the ability to access transaction history.

According to Little, technology planning will continue to remain high on Queensboro's agenda and will draw from a number of areas, ranging from employees to its various partners, including Cephas and IBM. "We are always looking for ways to use technology to improve and automate our processes," says Meyers. "This business was founded on the principal that increasing customer satisfaction through technology will lead us to the promised land."

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>
> — Steve Little

The Queensboro Shirt Company

**For more information,
please contact your**
IBM marketing representative or
IBM Business Partner.

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