Made for each other:

The marriage of the mammoth manufacturing industry and the quiet extranet.

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Manufacturing: A late bloomer

The manufacturing industry has been a sleeping giant when it comes to the Internet and e-business. One reason for this is that in the Internet's "Big Bang" beginning, everything that was e-commerce and e-business really focused around the B2C industries. One might think this focus on the consumer side would have given the B2B-heavy manufacturing industry time to get comfortably up to speed. But, that hasn't been the case. The problem is, the behemoths of big business have a very tough time steering in any new direction, let alone rapidly changing their technology course (over five-ten years). As a result, Internet and Web initiatives have been put squarely on the back burner.

One can't really blame the industry as a whole. In the first place, the technology systems that run the show in manufacturing create very complicated ecospheres. Even the smallest of manufacturers has methods of automation for creating/assembling/refining its product, and also places for recording and analyzing data involving procedures, prospects, inventories, and financials. When you begin factoring in all the different systems, formulas, files, products, inventory numbers, prices, costs, and margins…and, when you start talking about the intimidating balancing act that manufacturing relies on, it's easy to see that the complexities surrounding data automation, technology, and information sharing will never have a silver bullet.

A big factor has been cost. The price tag associated with moving to e-business and the Web has traditionally been expensive. Many manufacturing companies have already invested millions upon millions for enterprise-wide reporting systems, inventory control systems, supply chain and customer relationship management systems…and that's not even counting the bills for the long-standing (and pricey) method of EDI (Electronic Data Interchange). Any decisions that affect any one of those systems, even with the promise of improving the bottom line, has to be carefully evaluated and weighed against the real risk of inadvertently wreaking havoc on the delicate balance of the "ecosphere".

So, while this evaluating and balancing was going on…a funny thing happened. The dot-com explosion suddenly imploded. What followed has been a careful study of the Web, what it was, and what it could actually offer. As a result, Web tactics and methodologies have been dramatically honed over the last few years. This intense scrutiny has brought about the clearest focus to the uses of an extranet and its recognition as a powerful business tool.

This paper will examine the defining aspects of an extranet, the reasons that the extranet and the manufacturing industry were made for each other, an illustration of how the manufacturing industry's slow timing has yielded a clearer path to the Web than most, and an overview on choosing development tools with which to build your extranet.

Extranet: Introduced

Okay, so what exactly is an extranet? According to TechTarget's whatis.com site, the definition of an extranet is "a private network (or intranet) that uses the Internet protocol to securely share part of a business's information or operations with suppliers, vendors, partners, customers, or other businesses. It can be viewed as the external part of a company's intranet, extended to suppliers, vendors, partners, or customers."

In other words, it's a secured area of a business Web site, where information is password-protected, and where security codes, validation lists, and various other precautionary steps are taken to protect the purity of the site.

An extranet, simply stated, is the intranet's extroverted twin sister, and these two systems share the same *raison d'etre*. CIO Magazine defined it as such:

"The Three Tenets of Intranets

- Without information silos, information is not stored in discrete data repositories, but across the expanse of the network and its users;
- Without mailboxes, the sender and receiver of information are as close as possible to one another, with neither electronic nor human filters.

- Without cycle time, individuals can act on information as soon as it's available, which is a good thing.

Together, these tenets create the central argument advocating the extranet as a tool for making the enterprise faster, more responsive and more expansive."[1]

The acceptance and familiarity of the Internet during the last decade has changed the landscape of business forever. No matter your business, only companies that offer online e-business solutions in some form will truly be able to compete on a global playing field. Additionally, the dot-com frenzy's focus on differentiation has emphasized a new and unprecedented focus on customer service. As a result, most companies now recognize that the production of goods is only part of the story. To remain a success, such goods are now expected to go hand in hand with perceived services. This extends to business-to-business relationships.

Manufacturing and Extranet: The perfect match

Extranets, in general, offer four basic benefits: increased productivity, improved profitability, open communication, and centralization of resources.

Manufacturers, in general, rely heavily on organized distribution channels. Some sell directly to end-users. Others do both. Manufacturers also count on a network of suppliers and reliable forecasting, scheduling and contracting systems to keep its supply chain continuously running.

Combined, these traits fit in such a manner, that perhaps it's just technological fate, plain and simple, that has finally brought them together.

Increased Productivity.

The business-to-business use of extranets in manufacturing contributes to the increase in productivity by reducing the number of traditional supply chain "links," and automating the process through various extranet applications.

"It's no longer about manufacturer competing against manufacturer," says Tom Orlowski, VP of IS at the National Association of Manufacturers, "It's a supply chain competing against a supply chain."[2]

The term "supply chain" includes suppliers, distributors, customers, and any other business partner with which a company may be associated and wish to share information. An extranet's capabilities allows companies to communicate much more freely and at a much faster pace by linking up their internal systems operations with those of their authorized business partners.

Streamlining these processes improves productivity levels and gives employees on both sides the ability to concentrate on more mission-critical projects. Customized orders also become easier to perform. Contract manufacturers and component manufacturers that make products built to someone else's specifications can't just post an online catalog or shopping cart because their sales process is so unique, so the secure extranet becomes the perfect automated interface.

Extranets harbor incredible productivity benefits. Giga Group cites, "potential for up to an 80% impact on productivity: 40% of worker time spent processing documents, and 40% of worker time spent communicating during traditional means. [3]"

Improved Profitability.

Extranets streamline cumbersome processes, reduce paper usage with electronic files, and improve forecasting, making just-in-time manufacturing easier, and reducing the cost of inventory overhead. This all adds up to increased profitability.

One chemical manufacturing company estimates that online procurement using their extranet would eliminate 35% of steps from their current process, resulting in tremendous savings in both time and cost to the company. This company also projected that the time spent processing purchase orders would decrease by 65% as a result of this extranet. Not only

would the company save money through both of these means, but the employees will also be able to use their time for more strategic projects. [4]

An additional bonus of the extranet is the creation of new profit centers and business opportunities. By making it less expensive for smaller distributors or customers to view the product line, it opens up the possibility of added market share.

For example, Liz Claiborne launched a Web ordering system for retail buyers called @Market™: "The vision for the @Market™ system, which is being used exclusively with the Liz golf apparel line, was in both getting images out to smaller accounts that may not have the time or resources to travel to the shows, as well as getting retail orders in the system earlier. In less than 30 days from @Market's launch, the company has signed up 45 new specialty stores and pro shops. "[5]

Another effective use of the extranet by manufacturers and their distributors and customers are the availability of online versions of product manuals, warranties, and/or technical specifications that can be easily searched, or printed, in a self-serve format. This alone can greatly reduce the call volumes on help centers, which in turn reduces the cost of support, and the cost of printed materials.

Extranets have also been known to enable partnering businesses to:

- improve inventory tracking
- leverage existing custom and legacy applications
- and reduce production costs

All of which helps to improve profitability.

Open communication.

The fact is, whether it has an 80% impact on productivity or it simply strengthens one distributor's relationship, it's important to take note of the vast improvement of communication through extranets.

"The ability to collaborate and exchange ideas with others without time or geographic constraints means a better collection and sharing of market intelligence, as well as opening up better communication to and between business parties."[3]

Phil Gibson, interactive marketing director at a California manufacturer, also extols the benefits of fast communication. "[Extranets] make the company more effective," he says, "and the person who creates information is instantly available to the person who's using the information. The feedback loop hits real-time."[1]

"Snap-on, Inc…focused on improving electronic connections to distributors and customers. The Kenosha, WI toolmaker is setting up an extranet that will make it easier for distributors to order products, check inventory and order status, and view promotions."[2] Their next step includes plans to set up hosted Web portals that will let distributors extend online ordering to their customers.

This extension of the technology from their business partners to their partners' partners also goes toward championing the cause of information exchange. This has the potential to create an environment where customers could contact the manufacturer directly for such things as product suggestions and feedback, or requesting replacement parts for products, etc.

"Companies that prove to be efficient and collaborative trading partners will triumph over those that cling tightly to internal information and shield themselves from business processes outside their own walls."[2]

Centralization of Resources

Duplication and inaccurate data is not an uncommon problem in any industry. After all, to err is human. But, because of the size of the manufacturing industry as a whole, its mistakes can create an enormous liability. Such mistakes can come in all forms, from copying files for

security reasons, and accessing the wrong files later, to inaccurate inventories by disenfranchised employees. They run the gamut.

By exchanging live data with partners, vendors, and suppliers, allowing only secure access via an extranet, businesses are reducing the need to have duplicate databases, and increasing the chances for live just-in-time production capabilities. Also, the more eyeballs on the same data creates a checks and balances, of sorts. Familiar users have a better chance to flag potential problems when both sides of a partnership are monitoring the data.

"The automotive industry uses extranets to cut down on its redundant ordering processes and keep suppliers up to date on parts and design changes, allowing quicker response times to suppliers' problems and questions. Suppliers can receive proposals, submit bids, provide documents, and even collect payments through an extranet site. [6]

The development of a universal entry point via an extranet also gives distributors and end-users the opportunity to search, receive specifications, see photos, order items, and track/pay invoices in real time. This ease of use strengthens partnerships, saves both sides time and money, and gives manufacturers a chance to consolidate resources through automated ordering applications.

Additionally, manufacturing companies can also use these centralized exchanges for a number of other uses:

- Exchange large volumes of data using EDI (Electronic Data Interchange)
- Collaborate with other companies on joint development efforts
- Jointly develop and use training programs with other companies
- Provide or access services provided by one company to a group of other companies, such as an online order application.
- Share news of common interest exclusively with partner companies.
- Provide useful metrics and reports for key suppliers and key distributors with regard to purchase orders, and units fulfilled.

A rocky courtship

In the early days, getting data to the Web was quite a tricky business. It often required a batch process to move it to an entirely different machine, and then serve it to the Web. It could be, and often was, a colossal pain because the process involved coordinating the data move between disparate systems. For example, Oracle-housed data might have been moved to a SQL server, or DB2 database.

In cases like these, because the systems were so different, not all of the data would move over properly, and developers would need to first write business logic to handle moving everything over, and once over, there would be pockets of missing data, or data that wasn't formatted correctly. For instance, a 6-character date field might switch to an 8-character date field default on the Oracle box, which wouldn't match the DB2/400 data. The results would be inaccurate or nonsensical. Programmers or consultants would then need to write applications to handle each of those issues.

Supporting these systems became a full-time affair. Brand new applications needed to be written to allow customers or clients to extract the data from their new Web server, which required an entirely different skill set. A set of programmers, proficient in older languages (RPG, COBOL, etc.) would be faced with a Web server requiring a new development language, or perhaps expected to produce a graphic user interface written in HTML, a language they weren't familiar with. Users weren't the same users as before, or if they were the same, they often had a whole new set of needs.

In all these cases, companies were faced with an expensive choice. They could either commit to training their current crew of employees in a language like Java, and count on them to learn, embrace, and maintain both systems…or, they could hire a new team of experts to head up this new system. Such highly sought-after "experts," despite an expertise of only a couple of years in brand new (and evolving) languages, came with a hefty salary to boot.

After those issues were addressed, and each business chose its own brand of solution, another problem began to emerge: and the issue was data integrity. Many early adopters were handling two entirely separate sets of data, with two separate sets of applications to maintain the databases, and often two separate sets of users as well. Because the data was not accessible via the Web in real time, work was doubled, and data was easily corrupted, or at the very least, not easily reconciled.

To give a simple example, let's say a company maintained two separate databases, and on their Web site allowed their distributors to access and update account information: address, phone, etc. One distributor updates his address on May 5th on the Web site database, and an in-house customer service representative updates an address for the same distributor on May 6th, but when compared, the info doesn't match.

First of all, how can you match up the information, and secondly, once you do, which one is right? Who, ultimately, can oversee the maintenance of two such databases? What happens when that problem is scaled out and multiplied by hundreds of clashes of information a day between two very separate systems? Many companies were forced to find the answers to those questions firsthand, and paid a hefty price. But, fortunately, by finding the answers to such hard questions, those early Internet pioneers cleared the path for the rest of us.

Happily ever after

In just under a decade, the technology for Web development and database management has grown exponentially. Because of this record growth, and a focus on information sharing, interactive architecture, and open source initiatives, technology has evolved to offer a wide variety of options to more easily bring your company to the Web.

Now, due to security advances and new architectures, it's pretty common to be able to serve your Web site from the same machine that houses it. There is no need to maintain two separate databases, and data can be safely served in real time to anyone, anywhere in the world.

Not only that, but building and maintaining an extranet can be done by the same team that's been building and managing your green screen applications all of these years.

How is that possible?

Application development tools have evolved to incorporate a wide variety of features, not the least of which is rock-solid security. And, with the continuous evolution of technologies, development tools are an excellent way to leverage your staff's existing skills and their intimate knowledge of business logic, all while moving your business toward the future.

Whatever development tool you decide to use, you should look for one that fits your budget, fits your timeframe (including training and learning curves), and allows for global scalability. It is also generally recommended that for developmental flexibility, and application portability, the tool should include open source options, such as Java servlet capabilities.

Support is also a factor. John Enck had this advice in his article, *Choosing the right vendor*: "Does the vendor's support philosophy for the product match your project's support needs? Can you trace the line of support from the first call to the engineering resolution? Is engineering support available in the same country where the project is being run, or do you need to talk to engineers in the middle of the night?" [7] Additionally, is this support included in the maintenance, or licensing? Is it an additional fee, or part of a larger support package? The answers to those questions can largely affect the final price tag, so be aware.

Another consideration is the decision between using a development tool written in a proprietary language, or a tool written in native code. This decision is most affected by timeframe. Tools relying on their own proprietary languages are fine solutions, but often require months of additional software training in order to even begin development. And, those applications built with a vendor's proprietary language will also tie each of those business applications to the vendor indefinitely.

Tools on the market that are written in native code are not vendor-dependent, and many of these have opted for an easy-to-follow menu-driven environment.

The advantages to this unique Web-based point-and-click development interface include the following:

- easy server-based updates/maintenance
- upgrades and amazing accessibility (access to the development environment from anywhere in the world with a Web connection).
- written in Java servlets, it's fast and fully portable
- intuitive menu navigation, tab-based, so it's as easy to use as any Web page.
- create, build, test, and run the application all from within the same environment, which saves time.

Featured Product: m-Power

m-Power is among the most versatile development tools, easily deploying Java-based Web applications that are platform and database-independent. By simply changing a selection from its menu, an application built with m-Power, can be re-deployed to any of the above languages immediately. And, the user never needs to know a single line of code.

With its underlying n-tier architecture, m-Power re-invents itself with every new technology that comes its way. It has a specifications-based, and menu-driven interface, giving it one of the shortest learning curves in the industry.m-Power stays ahead of the technology pace, giving its users the ability to move forward with ease.

For more information, visit www.mrc-productivity.com/products or call mrc at 630.916.0662.

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