White Paper

GE Information Services

Entering the Extranet Era

How Extranets Can Help Create the Intelligent Supply Chain™

In the world of electronic commerce . . . We bring good things to life.

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Executive Summary

"As extranet commerce takes hold [during the years 1999 to 2001], companies will find themselves participating in multiple extranets, each with dozens of applications and thousands of trading partners…In this time frame, early extranet adopters will begin to erode measurable market share from their competitors."

"Maximizing Extranet Return"
July 1998 Forrester Research

It's clear that extranets are not simply the latest technology fad making the rounds of corporate offices. While only a minority of companies currently operate extranets, most businesses will launch an extranet or participate in one within the near future. Industry analysts at Gartner Group in Stamford, Connecticut USA (www.gartnerweb.com) predict that 80 percent of companies with electronic commerce programs today will use extranets within the next five years [1]. That's why smart companies are establishing their extranet strategies now, rather than later.

This paper by GE Information Services (GE) provides information on extranets for corporate decision-makers. It describes what extranets are, how they are being used for supply chain purposes, lessons learned by early adopters, and the role that outsourcing can play in helping a company benefit from extranet technology.

An Extranet Definition

Extranets are private Web communities. They enable companies to use Internet-based technologies to communicate and transact business securely with distributors, customers, and other business partners.

In order to accomplish this, an extranet must support the Internet's standard communications protocol, Transmission Control Protocol/Internet Protocol(TCP/IP), and others including File Transfer Protocol (FTP) for file transfer, and HyperText Markup Language (HTML) for displaying Web pages. An extranet also must employ strong, multi-layered security technology in order to shield unauthorized users from the system, applications and transactions.

Most businesses will launch an extranet or participate in one within the near future.

While major manufacturers, retailers and other large companies have transmitted standard business documents to trading partners over private networks known as Value-Added Networks (VANs) for many years, extranets allow companies to expand their electronic commerce programs in two primary ways:

1. They bring smaller and geographically remote trading partners into the electronic loop, thereby cutting excess costs and delays associated with standard supply chain processes.

2. They provide a platform to collaborate interactively with outside business partners. Such collaboration can have a positive impact on developing and introducing new products, managing distribution channels, managing supply chain operations, and/or delivering customer service. In doing so, extranets reduce costs and increase profits.

Part 1: Establishing an Extranet

An extranet is like a "private" business club. It provides a central location for forging deals, collaborating with outside companies, and transacting business with existing trading partners. In an extranet, however, the "club" operates on-line and, since it uses the same user-friendly technology that has made the Internet a global network, its "members" can include companies of all sizes located in virtually every corner of the world.

First generation "extranets" were modest arrangements that featured static Web pages of information. A user simply subscribed to the extranet service, accessed it from the Internet, and logged on with a simple password and user name. Some organizations still rely on static extranet systems to share information with trading partners.

However, extranet technology is evolving rapidly to facilitate the many complex processes that take place between companies. A number of organizations today operate dynamic extranets that improve communications via e-mail, bulletin boards and document-sharing capabilities. But the future is in collaborative extranets, which allow companies to work together on-line in order to deliver products faster and less expensively to end-customers. Although every extranet should be tailored to the unique needs of the company, collaborative extranets have certain elements in common:

- Extranets should enable the inter-company exchange of documents and communications. Extranets not only should ease basic communications with trading partners but, more importantly, should foster dynamic information exchanges and collaborations that streamline specific business processes throughout the supply chain. Some extranets, for example, enable retailers to share point-of-sale data captured at the cash register with relevant suppliers, who, in turn, can adjust their manufacturing and inventory-replenishment systems to meet the demand levels indicated by that data.

- Extranets must operate as a closed community of users subject to established business rules. Unlike a public Web site, an extranet is a private trading community, and the information exchanged within it often is proprietary.

- Extranets should promote collaborative decision-making in order to improve inter-company business and supply chain processes. A manufacturer that wants to accelerate product development cycles via its extranet, for example, must be able to share Computer Aided Design/Computer Aided Engineering (CAD/CAE) models, drawings and engineering changes with such outside trading partners as co-developers, piece-part suppliers and corporate customers. To do this, an extranet must be equipped for content-rich data transfers, document-audit trails, and action-workflow features, among other capabilities.

Extranet Security Issues

Because of the commercially-sensitive nature of the information exchanged within an extranet, each system must be buffered with appropriate security technology. While specific requirements vary from system to system, GE security experts have learned four universal lessons in the course of implementing corporate extranets:

1. make security a priority in the early planning stages

2. analyze the security risks, as well as the value of the information being published

3. apply the correct level of authentication and encryption technology

4. limit access from inside and outside the system.

Thorough planning and analysis are essential first steps when determining the security requirements for a particular extranet. In fact, the planning process itself should yield answers to a number of security-related questions, including:

Will the extranet site be visible on the Internet? If the answer is no, users either must connect to the extranet via a secure, private dial-up network (e.g., GE's High Performance Network), or some form of Virtual Private Network (VPN) technology must be incorporated into the system. Companies can use VPN technology to secure their entire extranet site through encryption. VPN technology encrypts information passing through the fire wall of the extranet site to the computer of the end user. It creates a secure tunnel through which data can flow back and forth until the user logs off of the extranet.

How much of the data is sensitive? Very sensitive data should be segregated on separate servers, behind additional "fire walls" of protective software that control user access.

Where and how will users get to the site? If users are dialing in via Internet Service Providers (ISPs), for example, standard desktop software and a certified browser will provide sufficient security. If a VPN must be employed, however, each user's desktop must have VPN client software, in addition to the standard desktop software and browser, in order to connect to the system securely.

How will content be loaded? If designated users need to load content over the Internet, for example, the system must be equipped with VPN technology. However, it's far safer to allow content to be loaded only from a trusted internal host computer, by a few selected system administrators and/or Web masters.

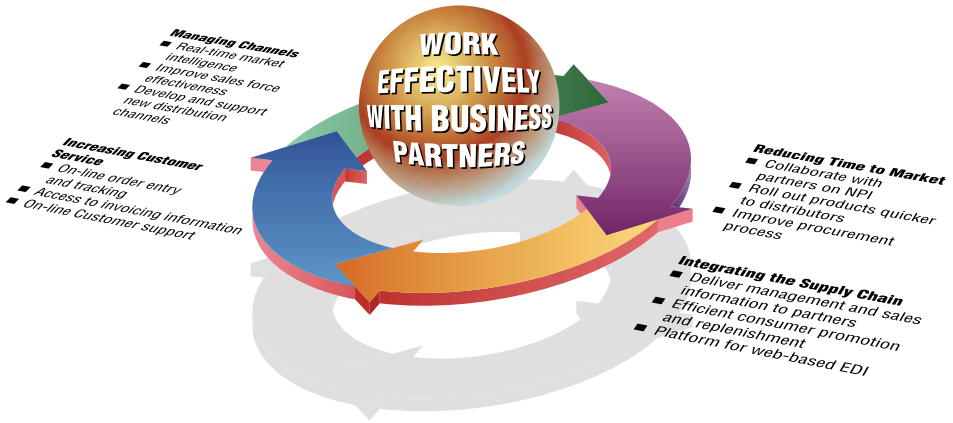
Are back-end connections required? Extranets with separate servers for sensitive data require additional fire walls to prevent unauthorized access.

Based on the answers to these and other questions, extranet planners can pinpoint the levels of authentication and encryption technology that are necessary to protect the system.

Authentication software manages and controls user access to the system. Extranets that are free of sensitive data can use a traditional user-name-and-password system to authenticate users. If more privacy is required, then the Secure Sockets Layer (SSL) protocol should be employed to encrypt all information as it passes over the Internet. In addition, digital certificates can be used, instead of the traditional user-name-and-password system, to authenticate users. A digital certificate is an electronic document that identifies a user's identity by a trusted third party. This security methodology is often referred to as Public Key Infrastructure (PKI).

Encryption software encodes and decodes information in order to protect the confidentiality of the extranet's data. In addition to encrypting information as it is transmitted over the Internet, it may also be necessary to encrypt data as it resides on the system. A database of credit card numbers is a good example of information that needs to be carefully protected through encryption.

Remember, too, that authentication and encryption technology should be used not only to foil external hackers, but also to pre-



vent unauthorized access by internal users. Studies show that extranets are more vulnerable to internal breaches than to external attacks. Therefore, an extranet must be built with security controls that restrict access to different parts of the system based on the user's profile.

The Decision to Build an Extranet

Building and maintaining an extranet can be a taxing undertaking. It requires a different mix of skills than those required for operating a company's internal intranet. Such skills include:

- the ability to target the internal business processes that most readily lend themselves to extranet technology
- expertise in developing extranet applications that address specific business processes
- a track record of creating the custom software necessary to link an extranet with a company's internal systems and those of outside trading partners
- experience in managing large (and often global) electronic trading communities.

Some companies have the resources and knowledge to handle the challenges of an extranet without straining their information technology (IT) staff or diverting resources from current business systems. However, many companies find their best option for guaranteeing the fastest and fullest return on investment is to outsource to a partner with a proven methodology for building and maintaining effective extranet communities.

Extranets and EDI — Complementary Technologies for Electronic Commerce

Extranets offer companies an almost unlimited means to expand and enrich their electronic commerce activities. Traditional electronic commerce has been taking place over private VANs for more than 20 years, mostly in the form of Electronic Data Interchange (EDI) transactions. EDI documents such as purchase orders, planning schedules and invoices give large companies an excellent way to eliminate the paperwork associated with high-volume, highly structured transactions with key suppliers. However, traditional EDI has its limitations. EDI transactions need to be transmitted in rigid, structured data formats that are suitable for only a few kinds of business documents. EDI is also a computer-to-computer technology that is

processed in batches. It was not designed to handle interactive and collaborative business processes. Thus, EDI alone is incapable of streamlining many processes that take place between trading partners.

Extranets, on the other hand, exploit open standard Internet technology that enables businesses to collaborate on-line by exchanging content-rich, multimedia documents (with graphics, sound, and video), as well as traditional electronic commerce transactions. Extranets also open avenues for reaching new trading partners and for reducing routine paperwork with smaller suppliers, distributors and customers. That's because extranets are built on Internet technologies that are affordable and available to businesses across the globe. Designated trading partners can access a company's extranet, for example, using their own personal computers, standard Web browser software and Internet access providers.

Since the old and new technologies each have their advantages, most companies will rely on a mix of both in their electronic commerce programs, at least for the short term.

Part 2: How Extranets Help Create Intelligent Supply Chains™

Companies that have launched extranets report a variety of benefits, but the most obvious and measurable pay-offs to date focus on improvements in supply chain management. Properly designed, an extranet can serve as a portal to internal applications used to support sourcing, procurement, manufacturing, marketing, distribution and customer service. Thus, a company can extend its legacy systems to its trading partners in a secure and cost-effective manner.

Further, a common goal of many companies is to access critical data that flow through their supply chain. Capturing the data that flows between companies and making it immediately accessible to the parties that need it is a concept which GE calls the Intelligent Supply Chain. Businesses can create Intelligent Supply Chains by using their extranets to share comprehensive information instantly with selected trading partners and customers.

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Companies with extranets, for example, can handle processes with supply chain partners in minutes, as opposed to the hours and days required to communicate via phone, fax and mail. They can also trim costs associated with supply chain processes because extranets eliminate the need to re-key information from one partner's system into that of the other.

Companies with established extranets are using them specifically to:

- share sales data and planning information interactively with suppliers to ensure the right product is available at the right time for customers;
- facilitate programs with suppliers that boost productivity, such as just-in-time manufacturing and vendor-managed inventory;
- enhance supplier performance through initiatives such as supplier score cards;
- speed new products to market by collaborating on-line with outside business partners;
- communicate product changes, promotions and inventory information instantaneously with distributors to boost competitiveness;

- develop new corporate sales channels across the globe to increase revenues;
- enhance customer satisfaction by initiating and tracking shipments on-line with logistics providers;
- improve cash flow by sending and receiving payments via electronic funds transfers from financial institutions;
- automate key activities with suppliers, from the moment an order is placed all the way through delivery and final payment.

An extranet can serve as the central technology platform that ties together various supply chain processes into a unified system. A typical organization will have software applications already in place for the various supply chain processes, such as procurement, manufacturing, distribution, and customer service. Extranets can extend these applications to external trading partners for improved productivity, reduced costs and other key benefits that have a positive financial impact on overall operations. Further, an extranet is scalable, which enables a company to add users and/or functionality as business needs evolve.

ROI Estimates

While it's easy to envision how an extranet can improve business processes, technology and business managers need to ask a fundamental question — what's a realistic return on investment (ROI) for an extranet? Real-life experiences in two of the many industries that GE serves — retail and manufacturing — can provide a benchmark.

In the retail industry, for example, few retailers and suppliers share data with each other on a consistent basis. This is starting to change, however, thanks to the Efficient Consumer Response (ECR) initiative, which identified a number of cost-saving opportunities within the retail industry. ECR Europe, for example, estimated that retailers and suppliers could jointly save 5.6 percent of their total sales volume simply by working together in sharing supply chain data and managing supply chain processes. For a large retailer with $25 billion in annual revenues, the opportunity is almost $1.4 billion.

In response to ECR, GE created an extranet model that facilitates supply chain integration and collaboration within the retail industry. The extranet platform allows retailers and suppliers to share administrative data, such as manuals and directories, as well as supply chain data, such as Electronic Point-of-Sale (EPOS) information. The extranet platform also serves as a tool for managing collaborative processes, such as product promotions.

Using the extranet, Tesco, the largest grocery retailer in the United Kingdom, has decreased the administrative costs associated with product promotions (promotional on-costs) by 30 percent. A story at the end of this paper explores the system's other business benefits for Tesco and suppliers.

Based on GE's experience with Tesco and its suppliers, GE calculates ROIs in excess of 700 percent from the deployment of an extranet for supply chain integration and collaboration. Impressive ROIs are possible because a retail extranet saves money by decreasing lost sales when products are not available on shelves, as well as wastage from products that sell below expectations. It also reduces administrative overhead by automating manual supply chain processes.

The manufacturing industry provides other examples of achievable ROIs for extranet projects. The paperwork required to plan,

order and deliver supplies slows down the manufacturing supply chain significantly. As a result, manufacturers' buyers spend too much time on paperwork and not enough time negotiating better contracts. Manufacturers also are unable to notify suppliers about production changes quickly enough to adjust orders, so a sizable chunk of direct materials — in some cases, the equivalent of 2 percent of a manufacturer's sales — must be scrapped or reworked before production.

GE estimates that an extranet solution for sharing supply chain data can reduce by 20 to 25 percent the number of supplies that must be reworked or scrapped. Processing transactions on-line also is less expensive than on paper, producing a $20 savings for every invoice that was once received via mail, and a $10 savings for every purchase order processed.

The collaborative extranet platform that GE has developed generates additional benefits because it coordinates the entire product-development cycle. The collaborative extranet platform assigns tasks and action items, tracks document revisions and responsibilities, and posts immediate notifications about design changes.

Based on the experiences of its customers, GE estimates that a manufacturer can use a collaborative extranet to reduce by 20 percent the number of incoming supplies that must be scrapped or reworked, as well as defects in finished products that must be repaired under warranty. A manufacturer that has $1 billion in annual revenues, and spends 5 percent of sales repairing supplies and finished products, for example, can reduce yearly expenses by $10 million.

The manufacturer can accrue $270,000 more in annual savings by using the extranet to reduce by 30 percent the number of engineering changes due to product errors and late definitions. In addition, one GE customer has lowered annual travel expenses by $800,000 because its extranet eliminates the need for many of the face-to-face meetings once required to coordinate product-development projects.

Companies with extranets experience other tangible but less-measurable competitive advantages. Some are improving service by enabling customers to place and track orders, check their accounts and access support systems on-line. Others are enhancing the effectiveness of their sales channels by exchanging real-time market intelligence with distributors.

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Additionally, extranets are built according to open standards, which means companies can integrate them with their existing systems, including individual business applications, Enterprise Resource Planning (ERP) workflow software and EDI platforms. Thus, extranets extend investments in legacy systems by enabling existing software to support both internal and external communications.

Lessons in Building Extranets

Businesses just beginning to plan extranets can learn valuable lessons from the experiences of companies that pioneered these electronic trading communities. Early adopters discovered two prevailing truths:

- extranets indeed can be a rewarding undertaking; but
- planning, deploying and maintaining a successful extranet is a demanding proposition.

One common misconception about extranets is that corporate IT staffs can extend their intranets to external trading partners with relative ease. This is not the case — extranets are different entities from intranets. With an extranet, an IT staff not only has to manage its own in-house environment, but also all the complexities of networking with outside companies and supporting external users. Web applications must be developed in cooperation with trading partners in order to support inter-company processes. Extranets must also be built with multi-layered and robust security features, and those features must be managed on an ongoing basis in order to shield commercially sensitive information from the prying eyes of competitors. Forrester Research analysts recently synthesized the experiences of 50 companies that had deployed these systems. Some 30 percent of companies surveyed said the biggest barrier to launching their extranets was the technology, for example, the process of connecting legacy systems and equipping the extranet with the necessary security [2]. GE predicts that the technology equation will not become any easier for companies in the near future, as the still-evolving technology features ever-growing numbers of applications, many of which will address the unique requirements of specific industries.

The trend toward outsourcing IT functions in general, and extranets in particular, is part of a larger phenomenon that is transforming the world of business.

Perhaps the most interesting finding of the Forrester Research survey, however, was that most companies (a combined 58 percent) said that a lack of internal cooperation among staff or external cooperation among trading partners had proven the most significant challenge to deploying their extranets. In other words, an extranet is as much a trading-community management issue as a technology undertaking. To be successful, an extranet must have the buy-in of a company's key departments and executives, as well as the trading partners it hopes to reach. This requires involving the major players — including outside trading partners — in the early planning stages to ensure that the extranet appeals to users and improves core business processes. It also requires substantial commitment to training end-users, administering the system and providing continuing support.

Part 3: Outsourcing Versus Building an Extranet In-House

Some fortunate businesses have the resources and personnel with the skills necessary to tackle end-to-end extranet projects in-house. But there are instances in which even these organizations should consider outsourcing a large portion of their extranet projects.

Most corporate IT departments are constrained by competing pressures, including:

- deploying and managing new internal systems such as ERP software and intranets
- maintaining staffing levels and training new employees with a relevant set of skills in a profession characterized by very high turnover rates
- operating existing legacy systems in order to keep the business running.

The peculiar challenges associated with extranets are fueling demand for extranet-outsourcing services.

The trend toward outsourcing IT functions in general, and extranets in particular, is part of a larger phenomenon that is trans-

forming the world of business. More and more companies also are outsourcing non-IT functions, such as customer service and logistics. "Since the late 1980s and increasingly as we hurtle toward the new millennium, outsourcing has become the de facto model for the modern business organization," GE experts reported in collaboration with Michael F. Corbett Associates in a white paper on the subject. [3]

When it comes to extranets, companies which opt for outsourcing can achieve three primary advantages:

Maximize ROI
Outsourcing partners with seasoned consulting services are essential for creating an extranet design that targets the best processes to improve with the technology, thereby ensuring maximum ROI. Experienced partners also can implement an extranet faster than can a company's hard-pressed internal staff, thus ensuring the fastest-possible pay-back. Additionally, outsourcing partners can enable a company to enjoy a larger pay-back by connecting significant volumes of trading partners rapidly to the system, and can deliver economies of scale that reduce the overall costs of operating an extranet.

Stay Focused on Core Competencies
Experienced extranet-outsourcing partners enable a company's existing IT staff to devote more time to the critical business at hand, such as supporting end-users and deploying new software systems that increase internal productivity, customer service and revenues. Outsourcing also eliminates the need to hire new staff, which not only is a costly venture but also a problematic one, given the worldwide shortage of IT professionals.

Reduce the Risks of New Technologies
Companies that outsource extranets benefit from lessons learned the hard way by partners with years of experience in managing electronic trading communities, not to mention more recent experience deploying extranets.

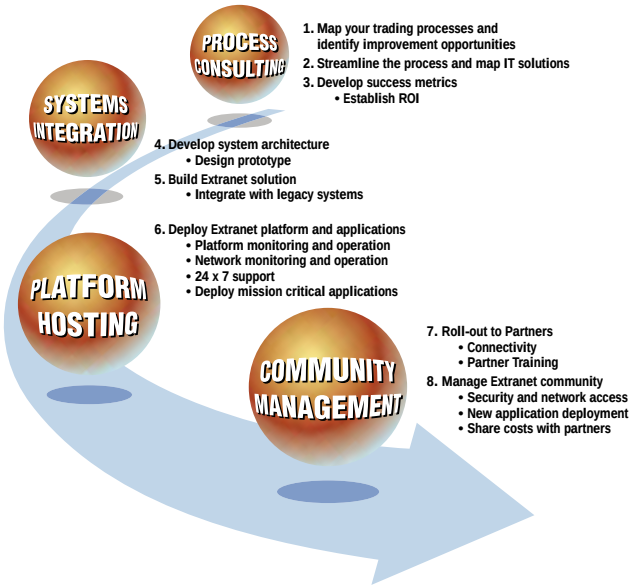
How to Choose a Suitable Extranet Outsourcing Partner

Although the benefits of outsourcing an extranet are clear, selecting the best outsourcing partner is a challenging task. Companies should start the process by developing a list of outsourcing contenders and, based on the answers to three questions, narrow the list to a manageable few. Those three questions are:

- ✓ Can the partner articulate a proven methodology for planning, deploying and maintaining effective extranets?
- ✓ Can the partner supply client references from companies within a business's industry, as well as examples of extranet-outsourcing projects that already are underway?
- ✓ Is the outsourcing partner a recognized market leader that is backed by a solid business history, as opposed to a newer firm with an uncertain future?

What is Essential for Successful Extranet Implementation?

GE has managed global electronic trading communities for more than 20 years. Based on this extensive experience, the company has developed a rigorous methodology that it uses to create and maintain extranets on behalf of corporate customers. Companies that are considering extranet-outsourcing services should query potential partners about specific capabilities they offer in four areas that GE has learned are keys to successful extranet projects: process consulting; sys-



tems integration and development; application hosting; and community management.

Process Consulting

Some companies are so dazzled by extranet technology that they forget the application's original purpose. An extranet is a strategic business tool, not a technology toy. Therefore, an extranet must reflect a company's business goals and objectives in order to be effective. The development of an extranet strategy should be handled by a company's business leaders, working in concert with the IT department, to create an extranet solution that addresses all their objectives and concerns.

Experienced outsourcing partners can start an extranet project off right by first reviewing a company's existing business processes. The partner can assess a company's supply chain strategy, distribution strategy, and customer-service strategy, while factoring in any industry-wide initiatives (e.g., ECR in the retail industry) and practices that affect the business.

For example, a major retailer's critical business processes may include programs for jointly managing product promotions with suppliers, introducing new products and packaging, and communicating supplier performance. A major manufacturer, on the other hand, may be more affected by the collaborative business processes it uses for new product designs, such as those to share and manage project plans, specifications, blueprints and test data with suppliers and contractors. A logistics provider's critical business processes may be completely different, centering instead on programs for tracking packages and conveying space availability and pricing to corporate customers. While an outsourcing partner's knowledge of prevailing industry practices is valuable throughout an extranet project, it is particularly important in the initial stages.

The outsourcing partner also can evaluate a company's trading-partner relationships to determine: the different types of information that currently are exchanged, as well as how much and how often; the processes that are followed; the current costs of managing and supporting these relationships; and key requirements of a company's trading partners.

With this information in hand, the outsourcing partner's consultants can:

- pinpoint and establish in order of priority specific business processes that can be improved
- identify likely internal and/or external resistance to the extranet and how to overcome it
- chart the best strategy for ensuring that trading partners will participate in the project
- estimate the resulting savings and ROI from launching an extranet
- define key metrics to measure the success of the implementation.

In some cases, a supplier may even advise against an extranet project if it is unlikely to produce significant results for a business.

Systems Development & Integration

The actual development of an extranet is no easy matter. First, the system's functional, technical, and operational requirements must be identified — a process best accomplished by pulling together team members with complementary talents. Team members also define the overall technical architecture, tools, and development approach necessary for the extranet, as well as preliminary costs and production schedules.

Next, the extranet must be designed to improve the critical processes that are unique to each electronic trading community. However, tactical capabilities alone will not ensure the success of an extranet: the system also must be user-friendly and secure. Accordingly, an outsourcing partner must consider a number of factors when designing an extranet, such as:

- how easy it is to use;
- how trading partners will use the system;
- how frequently the information exchanged via the extranet will change; and
- security requirements necessary for controlling user access and the confidentiality of individual transmissions.

During the design phase, team members translate broad requirements into detailed specifications for the extranet's components. They also design user interfaces and other system features, as well as map out future plans for system testing.

Next, developers build the extranet solution by creating application code based on the design specifications. Since off-the-shelf systems are rarely flexible enough to meet every community's needs, system developers often find they must customize software applications linked to an extranet, such as electronic catalogs and inventory replenishment systems. Developers also must build custom interfaces to integrate the extranet with existing legacy systems, including ERP software and EDI applications. For these reasons, companies selecting an outsourcing provider should insist that candidates demonstrate expertise in building custom applications for their environments.

However, even the best planned, designed, and integrated systems require testing to ensure that they are workable. System testing confirms that the extranet's components work together as specified, and integration testing verifies that the application as a whole performs as expected. A company launching an extranet also can prevent expensive mistakes down the road by taking advantage of usability labs, a service that some outsourcing partners offer. Usability labs enable a company to pilot its system with selected partners before the extranet is rolled out to the entire trading community.

Lastly, outsourcing partners that develop extranets should back their systems with training programs which are scaled to the needs of their customers. Training options should include documentation (e.g., administrator guides, user guides, operational-support guides), as well as classroom and workshop sessions.

Platform Hosting

Extranets must be reliable, quickly accessible and secure since they are used for mission-critical processes between a company and its trading partners. They also must be scalable to adjust to the changing size and needs of the trading community. This poses certain requirements for outsourcing partners that "host" a company's extranet platform.

In general, an outsourcing partner that hosts an extranet is responsible for deploying the system, managing it and handling network operations. More specifically, the outsourcing partner must: oversee the procurement, installation and configuration of necessary hardware for the system; connect the Web-based system to a private network; and continually monitor the system and its network.

Despite its many advantages, the public Internet can be a notoriously slow and insecure medium for transmitting private data — hence the need for private-network connections and constant monitoring. An outsourcing partner must be able to provide:

- round-the-clock support;
- data and hardware backup for its network;
- high performance and quick response times;
- a secure environment that protects confidential data.

Community Management

Companies embarking on extranet projects typically are unaware of how critical trading-community management issues can be to the success of their efforts. In traditional electronic commerce using EDI, The EDI Group of Oak Park, Illinois USA (www.edigroup.com) estimates that it takes an average 79 days just to implement the first transaction set with a new trading partner [4]. User-friendly extranet technology can speed implementation significantly, yet there still are major challenges to rolling out and maintaining an electronic trading community. Because of this, community management is proving to be the central issue in Internet trading, just as it was in traditional electronic commerce.

The first community-management problem that companies face when launching an extranet is the difficult process of involving trading partners in the early planning stages of the project. Because of this, many extranets are designed with only limited input from trading partners, even though the support of these users is essential for maximum ROI.

Creating an electronic trading community also is a complex undertaking. Even if an extranet appeals to trading partners, users still must be educated and trained, fee structures must be agreed upon, security and user-access controls must be put in place, applications must be supported, and processes must be negotiated with trading partners. The community must be maintained on a continuing basis, and any shared elements of the extranet, such as content, must be jointly managed with trading partners. Additionally, a feedback mechanism (e.g., a user group) must be established to ensure that the extranet continues to meet the community's needs. Indeed, all future development of the extranet must be driven not only by the company's requirements, but also by those of trading partners.

To surmount these obstacles, outsourcing partners must have a background in administering large and sometimes global electronic trading communities. Outsourcing partners also should offer a variety of community-management capabilities, including:

- partner-initiation services for contacting trading partners, explaining the extranet concept and its benefits to them and addressing their initial questions and problems. In addition, such services should include setting a partner up with the necessary connectivity software if that partner will be accessing the extranet via a private network, rather than the public Internet.

- a means of generating, distributing and renewing digital certificates, if these are used to control user access to the system. To support digital certificates, the outsourcing partner must provide a public key infrastructure (PKI) to authenticate each partner's identity, issue digital certificates and manage renewals and revocations.

- systems for negotiating fee structures with trading partners and billing them for the service, if so desired. This is one of the most overlooked benefits of outsourcing extranets to experienced partners. Companies that handle extranet projects in-house tend to absorb all the costs because of the difficulties related to billing trading partners for usage. Third-party outsourcing partners are in a position to recover some of a company's costs through subscription billing to trading partners, as well as handle the ongoing management and operations of the trading community.

Part 4: Conclusions

Extranets can deliver tremendous financial rewards for companies. In order to accomplish this, however, extranets must be well-planned, designed, deployed and maintained. Most companies will have difficulty handling an extranet project on their own without straining their IT staff or diverting resources from current business systems. The process of managing an extranet's trading community requirements is particularly daunting. Therefore, companies planning extranet projects should explore the outsourcing services of qualified and experienced partners to ensure the best return on investments.

Part 5: Real-Life Extranet Stories

Tesco plc — Grocer's Extranet Gives Suppliers New Tool

From *LinkAGE* Vol. 6, No. 3, 1998, published by GE Information Services

One thing shoppers won't find at Tesco, the largest food retailer in the United Kingdom, are empty shelves. Tesco has begun rolling out the Tesco Information Exchange (TIE), an extranet that will link the retailer with all of its suppliers to increase product availability and reduce waste.

One such supplier, St. Ivel, expects that TIE will enable the company to save 30 percent of its annual promotional on-costs, which refers to the cost of promotions.

Extranets can deliver tremendous financial rewards for companies. In order to accomplish this, however, extranets must be well-planned, designed, deployed and maintained.

"With TIE, our [promotion] forecasting improved significantly," says Dan Rusga, national account manager. He adds that "sharing estimates with Tesco early on in the process highlighted any significant differences between our estimates and those of Tesco and ensured that we jointly agreed on the way forward."

Developed in partnership with GE Information Services (GE), TIE is an extranet Web site that can be accessed through the Internet or through GE's global network. Suppliers can access Tesco's sales data electronically to track only their own products and to review specifications for new product lines. A combination of fire walls, service passwords, and security protocols ensures security.

Based at GE's Supercentre in Amstelveen, Holland, the extranet is an open-architecture solution that incorporates standard Web, database, and corporate systems-integration components.

TIE trials earlier this year persuaded Tesco Divisional Director Joe Galloway of the extranet's effectiveness. One Tesco supplier participating in the trial spotted that demand for a certain product had reached 8,000 cases after two days, compared to the original forecast of 10,000 for the whole week. The supplier increased the supply at short notice and realized a profit of almost £20,000 — about US$30,000.

Galloway emphasizes that TIE is not a substitute for high-volume electronic data interchange (EDI) transactions. Rather, it complements existing EDI networks, he says, by allowing the sharing of basic supply information. Suppliers now can take joint responsibility for planning, tracking, and evaluating promotions and, because they can access new specifications electronically, they can respond more quickly to requests for new product lines.

"Ensuring our customers always get the products they came into Tesco for is key to our business," Galloway says. Using TIE, Tesco ensures that customers won't go home empty-handed.

Dayton Hudson Corporation . — Retailer's Extranet to Link 12,000 Suppliers

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If you need a new pair of running shoes or a 96-pack of disposable diapers, you might make a quick trip to your neighborhood Target store. However, if you are one of the 12,000 suppliers that supply goods to the five retail store chains owned by Dayton Hudson Corporation — Target, Mervyn's California, Dayton, Hudson's, and Marshall Field's — you can soon do business with the fifth-largest retailer in the United States simply by taking a trip down the information superhighway.

Thanks to GE Information Services, Dayton Hudson has a new extranet, an Internet-based network that links companies with their trading partners. When it's up and running at full capacity by mid-1999, the GE system will enable about 12,000 Dayton Hudson suppliers to do business on-line, says Rachelle Chase, director of electronic commerce services at Dayton Hudson.

About 600 companies are currently being registered on the new computerized system, says Brian Pinci, GE program manager for Internet solutions and professional services.

GE's InterBusiness Partner is the foundation of Dayton Hudson's supplier extranet. The first commercially available extranet service, GE InterBusiness Partner leverages Internet technology to create a private Web site or community for a company's employees, customers, and suppliers to exchange information. GE has posted on the Web the Dayton Hudson Vendor Partnership Manual — a thick book that the retailer formerly updated and reprinted quarterly. Now Dayton Hudson simply updates the Web version, and suppliers can download the new information.

In addition to enabling suppliers to do business more easily with the retail giant on its extranet, GE has saved Dayton Hudson money by providing exclusive Value Added Network (VAN) services to its trading partners. Dayton Hudson, which had $27.7 billion in revenue last year, has been automated since 1986. However, it used a handful of ser-

vice providers, including GE, to help process its electronic data interchange (EDI) transactions. The three corporate divisions — Target, Mervyn's California, and the three department stores — used different systems, and that was an expensive set-up.

So in 1997, Dayton Hudson consolidated its vendors and began outsourcing all of its EDI business to GE. As a result, Dayton Hudson has reduced overall EDI processing expense. "Since consolidating VAN services with GE, we have saved over 50 percent on EDI processing costs," says Chase. "We no longer need to have a unique process for each firm we do business with."

Nuovo Pignone Creates an Extended Company With Suppliers and Customers Through Extranet

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To Nuovo Pignone, a GE subsidiary that makes products for the oil, natural gas, chemical, and power-generation industries, suppliers and customers are part of its extended-company concept. To communicate more easily and efficiently with both, Nuovo Pignone, based in Florence, Italy, turned to GE Information Services. GE created an extranet that is based on the Internet but assures the privacy, reliability, and security of Nuovo Pignone's communications.

The extranet, which Nuovo Pignone has been using since 1996, allows the company to share data and conduct transactions with a clearly defined group of partners, both within the company and outside it. As an added benefit, the extranet communications are faster, more effective, and more economical than those using traditional modes, says Maurizio Ammannato, of GE's marketing and sales support division.

In addition, Nuovo Pignone uses the extranet not only to provide existing services but also to facilitate the introduction of new ones. For example, until recently, the more than 1,000 Nuovo Pignone suppliers regularly flooded its payment-information phone service. Now they can access secure payment information through Nuovo Pignone's extranet around the clock. Giorgio Piazza, the company's Internet and e-mail manager, says Nuovo Pignone also has used the extranet to open a new sales channel for products and services aimed at a large consumer market.

In addition, the extranet enables Nuovo Pignone to:

- manage customer orders over an electronic data interchange (EDI) system, thus potentially reducing order and invoice cycle times dramatically;
- offer information to customers on products, services, and second-hand equipment on a Customer Care Service Web site;
- update regularly and maintain the accessibility of an on-line, electronic catalog for spare parts;
- exchange text, drawings, and images more easily with its customers via smart file transfer protocol (FTP); and
- adopt new technologies while protecting its existing investments.

For more information about Nuovo Pignone, visit its Web site at: http://www.ge.com/nuovopignone.

About GE Information Services

GE Information Services offers organizations a variety of electronic commerce solutions for managing business processes with suppliers, distributors and corporate customers. The company has been in the electronic commerce business for more than 30 years and today operates the world's largest electronic community, encompassing more than 100,000 users in over 40 countries.

GE in recent years has expanded its traditional electronic commerce solutions, including EDI systems and private network services, to embrace Internet technologies that add value to its customers. In 1996, the company achieved a number of firsts in Internet commerce: it launched GE InterBusiness Partner, the first Extranet service on the market; GE TradeWeb, the first commercially available service for Web EDI; and TPN Post, GE's first electronic marketplace for managing requests for proposals (RFPs) and supplier bidding over the Internet.

GE has collaborated with several industry giants to develop new Internet-based commerce technologies and a Web-based electronic marketplace that streamlines the corporate procurement of non-production supplies. The company has developed an extensive portfolio of Extranet-outsourcing services, including industry-specific solutions, and offers a proven methodology for creating and maintaining Extranets.

GE Information Services is a unit of the General Electric Company of America. For more information, please visit www.geis.com on the World Wide Web; contact your local GE Information Services representative; or contact one of our worldwide offices.

Footnotes

[1] Quote from Geri Spieler, Gartner Group in *Information Week* magazine, January 5, 1998.

[2] "Maximizing Extranet Return" by Steven Bell, Mary Modahl and Gordon Lanpher of Forrester Research. July 1998.

[3] "Building Virtual Trading Communities Through Electronic Commerce Outsourcing" by GE Information Services in association with Michael F. Corbett & Associates.

[4] Please see Footnote 3.

In the world of electronic commerce . . . We bring good things to life.