

Enterprise Applications

The very life blood of our enterprise.

—WILLIAM SHAKESPEARE (*KING HENRY IV*, PT 1., ACT IV, SCENE 1)

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An “enterprise application” is an application that is widely used throughout the organization, and integrates the operations of many different departments and functions. Enterprise applications are very valuable but can be very complex pieces of software. They require extensive planning to implement, and can be very expensive.

For large companies, with hundreds and thousands of users, the value of connecting all of their functions is enormous, but so are the tasks of implementing and administering the software. This chapter discusses several enterprise applications: e-mail, directory services, and enterprise resource planning (ERP).

15.1

E-mail

When organizations are doing their disaster recovery planning, one of the applications that is almost always deemed

CHAPTER FIFTEEN

mission critical is e-mail. E-mail has become the lifeblood of communications for virtually all organizations. For a task as simple as seeing if a colleague is free for lunch, many will reach first for the keyboard, as opposed to the telephone.

Usage Statistics

A Hewlett-Packard sponsored white paper by the Radicati Group published in 2005 revealed some staggering information about e-mail.

- ◆ Based on research, corporate users send and receive an average of 133 messages per day, and this number is expected to reach 160 messages by 2009.
- ◆ With the average size of a single message currently around 0.11 MB, the daily e-mail storage requirement for a single user is 14.7 MB. This translates into 294 MB per user, per month (assuming 20 business days per month) for corporations that maintain a standard 30-day e-mail retention period.
- ◆ The average corporate e-mail user sends and receives nearly 15 MB of e-mail per day. For a company with 10,000 e-mail users, that adds up to about 147 GB per day, 735 GB per week, or approximately 2.9 TB per month.
- ◆ Table 15.1 from the white paper shows the projected growth of corporate e-mail traffic from 2005 to 2009.

Table 15.1 Average corporate e-mail user. (Source: <http://h71028.www7.hp.com/ERC/downloads/5983-2385EN.pdf>)

	2005	2009
Messages Sent/Received Per Day	133	160
Messages Received Per Day	99	109
Messages Sent Per Day	34	51
Messages w/Attachments	22	28
Messages w/o Attachments	111	132
Avg. Attachment Size	469 KB	545 KB
Avg. Message Size (w/o attach.)	38 KB	46 KB
Avg. Total Storage Per User/Day	14.7 MB	21.3 MB

Advantages and Disadvantages of E-mail

In today's world, access to e-mail is as much of a requirement as a telephone.

In fact, it's not unusual to do more communication via e-mail than via telephone.

Table 15.2 Pros and cons of e-mail

PRO		CON	
	Since e-mail (unlike face-to-face discussion, instant messaging, or telephone conversations) is not a real-time medium, the recipient can deal with the communication at their convenience — minutes, hours, or days after the sender has sent it.		The tone of a message may be misinterpreted. Virtually everyone has experienced the situation where some intended levity or sarcasm was not picked up by the reader.
	It can be implemented with features to allow for collaborative online work.		Some people are more comfortable with written communications than others, and the extensive use of e-mail may make some feel at a disadvantage.
	It creates a virtual paper trail for who said what, to whom, and when.		There is greater risk of confidential communications getting wider distribution than intended.
	It can easily include additional reference material (file attachments, Web links, etc.).		It can reduce the amount of face-to-face discussions, which may frustrate some people, make the interaction feel impersonal, or lead to confusion.
	Delivery is virtually immediate (even if the recipient doesn't deal with it right away).		Because it isn't interactive, it often doesn't lend itself to the discussion of complex or involved issues.

(Cont.)

Table 15.2 Pros and cons of e-mail (continued)

PRO	There is little chance of the communication being lost, although filtering technologies (e.g., anti-virus, anti-spam) can misdirect some messages.	CON	Because it's so convenient, it can easily be overwhelming, possibly even leading to over-communication.
	It allows the recipients to scan the material to find the pertinent information (unlike voice-mail messages, which have to be listened to in their entirety).		
	With integration to hand-helds and cell phones, it's virtually an anytime, anywhere solution.		
	Individuals can be added to, or removed from, a message thread, easily.		
	It can be integrated with telephone systems so that e-mail software can be used to hear voice mail messages, and view faxes, etc.		

E-mail versus Phone Calls

E-mail is often the fastest and most efficient method of making an exchange of information.

- ◆ Phone calls can be faster, but the information exchanged is (for the most part) not recorded.
- ◆ Phone calls aren't in a form that lends itself to re-evaluation.
- ◆ Phone calls aren't appropriate for all exchanges because of the length of some material.
- ◆ Voice mail (v-mail) doesn't lend itself to lengthy messages.

- ◆ E-mail, on the other hand, can be quite long and very detailed in its content, because the recipient can easily scan the message for the pertinent items, re-read portions as needed, etc.

E-mail versus Faxes

Faxes also are limited in their own way: length can be an issue (nobody likes getting or sending a 20-page fax, although it happens every day), not everyone has a fax machine, the machines can be busy, you can't be sure about the quality at the other end, and so on. Technology exists now to send and receive faxes from the desktop, but this brings faxing closer and closer to e-mail.

The Quality of Communication

It's clear that the growth of e-mail has radically increased communication both within the corporation and between the corporation and its customers. There is no question the *quantity* has increased; the issue commonly is: "Has the *quality* of communication gotten any better?" In other words, we are all getting more e-mail, but is the value increasing? And in general, "Am I better off with e-mail, or is it just another task I need to do during the day?"

Overall, the answer is a qualified "Yes," because e-mail is a tool, and tools can be used well or poorly. It's in your interest as an IT Manager to monitor both the quantity and quality of the e-mail in your company. Keeping tabs on the amount of e-mail being sent is relatively simple since there are tools built into the various programs (as well as third party offerings) that allow you to monitor usage.

How do you track the quality of your company's e-mail? You can't. But you can educate your users about the benefits of better quality e-mail. Often, people only need to be told once and they will alter their behavior. Many people have never been taught how to effectively use e-mail, and they're ripe for a quick lesson or two.

Educate Your Users on the Key Principles of E-mail

You (or the Training department, if you have one) can offer a class on the e-mail system you use and tips for effective communication. And you might have some success getting people to that class, especially if you have upper management buy in. But the truth is, these programs aren't that complex and the basic functions can be easily learned. What you need to get across to all your users

are some simple principles of using e-mail that are less software-oriented and more usage-oriented:

- ◆ **Keep it brief.** If you don't like reading long e-mails, what makes you think others do? Keep it as short as possible. E-mail is fast and efficient, but reading a lot of text online isn't easy. Don't try to cover too many items or areas in a single e-mail.
- ◆ **Make the subject line count.** Be as clear in this line as possible. Instead of using "meeting" as your subject line, use something more indicative like "operations review status meeting."
- ◆ **Reply to all e-mails that expect one.** Not every e-mail that is sent needs a reply, but many do. If you send something to somebody, you expect a reply. Provide the same courtesy.
- ◆ **Differentiate TO and CC recipients.** As a general rule, people on the TO line are people who need to know and/or have to take action with the content of the message. People who are on the line for CC (which stands for carbon copy, a "technology" that pre-dates photocopy machines) are generally getting the information on an FYI basis. (Blind Carbon Copy, BCC, the third line on many e-mail windows, is another term that dates way back. It allows you to send a copy to other people without informing the addressee that you're doing so. Tell your users to use this option only with great care.)
- ◆ **Use the Reply All button with extreme caution.** This button is probably the largest contributor to e-mail waste. Everyone doesn't have to be copied on every e-mail. Sometimes just replying to the sender suffices. Sometimes a subset of the recipients needs to be informed. Much less frequently, all the recipients of the original e-mail need to be replied to; this occurs less often than people realize. If you can get your users to think before they use this button, the effect on your volume of e-mail will be dramatic. Many users don't know the damage they are causing by routinely using this button and will change their behavior when it's explained to them.
- ◆ **Spell-check all e-mails.** All e-mail programs now have a function that allows e-mail to be automatically spell-checked. Even though proper spelling, grammar, and punctuation have been early casualties as the world has moved online, you should remember that you're still working in a business environment. And, while the occasional typo or two may be forgiven, they should be avoided. Typos are at the very least annoying, but they can also be devastating and, in general, degrade the value of the message. Automatically spell-checking e-mail is an example of a very useful, everyday software function. Everyone should do it.

- ◆ **When stressed or angered, don't hit the Send button.** Sometimes people receive an e-mail (or phone call) that angers them, and they fire off a response in the heat of that anger. (E-mails of this kind are often called “nasty-grams,” or “poison-pen” e-mails.) When stressed or angered, it's wise to wait until you've had a chance to cool off so that your note isn't overly emotional.
- ◆ **Define policies and guidelines for saving e-mail.** What do you want your users to do? How do you want them to save their e-mails? Provide your users with a specific plan. Do you want them to store up a month's worth on their hard drive? They need to save only the items that they will need quick access to. Your e-mail system probably has features to help you manage this. You may be able to automatically purge e-mail that reaches a certain age, or you may be able to limit the size of a message, as well as the size of a user's mailbox.

Besides telling users that they can delete their old e-mail, you should tell them that their e-mail is backed up daily so that they don't feel the need to save every little scrap.

E-mail Product Choices

There are many different e-mail programs to choose from, and all rely on industry standards.

Industry Standards

There are many e-mail programs, and many methods of implementing these programs. One of the most important options when considering e-mail is the matter of *industry standards* to ensure that you can exchange messages with users who aren't on your e-mail system. There are many products that adhere to industry standards (IMAP4, POP-3), and a few very popular products (e.g., Microsoft's Exchange, IBM's Lotus Notes, and Novell's GroupWise) that have added their own proprietary enhancements (such as group calendaring and scheduling) in addition to supporting industry standards. These enhancements allow the vendors to add value to their product, as well as support industry standards to ensure messaging interoperability with other products.

By adhering to industry standard protocols, you can mix and match server and client software products and can very often find various products to fit your needs (e.g., Netscape, Microsoft Outlook Express, Thunderbird, Eudora).

Internet Message Access Protocol Internet Message Access Protocol (IMAP, generally referred to as “IMAP4” to denote its current incarnation) can be

thought of as a client/server environment that allows you to view and manipulate e-mail while it's still on the server. The advantage to this is that users' mailboxes are accessible to them from any properly configured workstation. On the downside, it means that the mail server has to have a very large storage capacity.

Post Office Protocol 3 Post Office Protocol 3 (POP-3) can be thought of as a store-and-forward environment. Your mail is held for you on the server until you connect; then it's downloaded to your workstation. So, if you then go to another workstation, you won't see your mail since it's now on the first workstation.

POP-3 is supported by all the major browsers (Internet Explorer, Firefox, Netscape, etc.).

Multipurpose Internet Mail Extensions The Multipurpose Internet Mail Extensions (MIME) specification is for formatting non-text messages (e.g., graphics, audio, video) so that they can be sent over the Internet. A variation of MIME, called S/MIME, supports encrypted messages.

Proprietary Products

On the other hand, proprietary products from vendors like Microsoft, Novell, and IBM, which support the industry standards, offer additional features (group scheduling and calendaring, full-featured address books, collaborative discussions, bulletin boards, etc.) that make them very attractive as solutions for much more than just e-mail.

The following are some of the most popular e-mail solutions for enterprise environments:

- ◆ Microsoft Exchange (which uses Microsoft's Outlook as the client)
- ◆ IBM's Lotus Notes
- ◆ Novell's GroupWise

Between them, they own the lion's share of the market for e-mail programs in large organizations.

Why You Should Consider Using One of These Products While the most popular software packages aren't often the best products, there are valid reasons for using products that the market has embraced.

- ◆ The learning curve isn't as steep; because of their popularity, their use continues to grow. New people joining your company more likely will

have experience in one of these packages; they won't need training to get them going.

- ◆ As with any software, the more people that use it, the more support and third party activity that will be available.
- ◆ Two of the vendors' products (Microsoft and IBM) have become part of a bundled suite of software. The e-mail program's features are integrated tightly into the features of the other programs.
- ◆ These products generally offer advanced management and administration tools for their messaging environments.
- ◆ There are many third party applications available (e.g., anti-virus, anti-spam, monitoring) that can integrate with these e-mail platforms.
- ◆ It's easier to find IT staff who are skilled with the more popular packages.

Unified Messaging

Unified messaging is the term applied to integrating your voice mail and e-mail systems. In short, you can use your e-mail system to access your v-mail (messages appear in your inbox as audio files), and use your v-mail system to access your e-mail (a synthesized voice reads your e-mail messages to you). Unified messaging can also allow you to send and receive faxes from your e-mail inbox, and can greatly reduce the amount of paper associated with traditional faxing. This technology is just beginning to gain acceptance and is still maturing.

It's also important to note that there are several ways to attack the integration:

1. Your v-mail vendor may sell a system that integrates to your e-mail environment.
2. Your e-mail vendor may have an add-on to integrate with your v-mail.
3. A third party vendor may offer a product to tie the two messaging systems together.

Unified messaging can be complex and may be costly. It also greatly increases the storage requirements since users will have a greater amount of flexibility in saving and forwarding voice mail messages. Even if you aren't planning to implement unified messaging immediately, however, you may want to consider it as an issue if you're evaluating new e-mail systems.

Managing E-mail

Because e-mail can quickly get out of control, it needs to be managed aggressively. Managing it can become a large part of your day; if you have a large company, it can become the sole responsibility of a team of people. A number of vendors offer solutions for monitoring e-mail and to address issues like spam and viruses, etc.

Chapter 13, Security (page 349), covers important aspects related to e-mail, in addition to what is covered below.

Junk Mail (Spam, Chain Letters, Phishing, Jokes, etc.)

While e-mail can be a very valuable tool for circulating vital information very quickly, it can distribute junk just as quickly. If someone receives an e-mail of a joke or a spiritual message that they like, they can circulate it to one person—or thousands—with just a few clicks of the mouse. Although it may seem innocent at first, the growth can be exponential, and it results in massive storage requirements for e-mail servers. It can slow down the delivery of mail because your servers are backed up distributing hundreds or thousands of messages unrelated to work.

E-mail packages now let the user identify the sources of spammers or junk mail senders. With a feature like this, once a source of junk mail is identified, any future mail from the same source is immediately deleted. There are also a variety of anti-spam solutions that are implemented at the e-mail gateway, so that spam never reaches your users' mailboxes. But, even these anti-spam solutions, which are designed to help you manage e-mail, require their own management. Because they aren't foolproof, there may be some issues of false-positives (legitimate e-mail incorrectly identified as spam), and false-negatives (junk mail incorrectly identified as a legitimate message). These issues can lead to more calls to the Help Desk, and your staff tracking down misdirected e-mails. You may also need to maintain white and black lists for your anti-spam solution. White lists identify senders whose mail should always be treated as legitimate, and black lists identify senders whose mail should always be treated as spam. These lists override the determination that the anti-spam solution would make based on its own algorithms.

Harassment

While e-mails with jokes and spiritual messages may seem innocent, they can easily cross the line and some may be seen as offensive or harassment. Your organization should have a clear-cut policy (from senior management, not from

IT) that indicates a zero tolerance for any material (including e-mail) that can be construed as offensive on grounds of sexual harassment, racial discrimination, and so on. It isn't uncommon for e-mail messages to be included as evidence in a various types of litigation. Work with your Legal and HR departments to define, if you haven't done so already, a clear e-mail policy.

Viruses

In the days of yore, computer viruses were most often spread via diskettes, and then through files shared on the LAN. Now, e-mail is one of the most effective methods of spreading a virus. Virus creators, in addition to programming them with disruptive behavior, now also program them to go into your e-mail address book and to re-send themselves to your family, friends, and co-workers down the hall, across the country, and around the globe. An effectively programmed virus can have an enormous global impact in just a matter of days, if not sooner.

Although you should certainly educate your users about messages from unknown sources, a more aggressive posture is also called for. All your workstations and servers should run virus-checking software. In addition, you should have anti-virus software on your e-mail servers that scans messages and their attachments for viruses. Products from Trend Micro, Symantec, McAfee, among others, are relatively inexpensive for the protection they provide. See Chapter 13, Security, for more information regarding viruses and how to defend against them.

Data Size and Retention

Because e-mail is so often used to distribute big files, such as large presentations as well as games and jokes, the amount of storage required to keep it all can be massive. As such, it isn't unusual to have a corporate policy that sets limits on the size of messages, the size of mailboxes, and the age of messages. These limitations are available with the most popular e-mail packages. It's important that users be made aware of these policies, and that the limits be set after considering users' needs.

Another way of addressing space concerns with e-mail is to archive older messages to tape storage. See Chapter 16, Storage and Backup, for a detailed discussion of data storage mechanisms. HR and/or your Legal department may want to get involved in setting these policies, particularly with any related to message retention.

Users should also be aware that limits may be in effect regarding external users with which they send and receive mail. Be clear to your users that just

because their e-mail size limit is large, that doesn't mean other companies have the same limit. As such, if you allow your users to send messages of a certain size, there is no guarantee that the message will get through since the recipient's mail environment could very well have a lower limit. You will hear complaints about messages that didn't go through (or messages that your users didn't receive).

Appropriate Use

Just like with the use of the company phones, it's reasonable to expect that not every message your users send will be work related. There will be an occasional personal message. Most organizations expect and tolerate this as long as they aren't oversized and don't contain offensive e-mails. However, it's wise to have a formal policy (just like the one that probably exists for use of the company phones) saying that e-mail is for work-related use only. Some organizations will explicitly state that some personal use of e-mail is okay, as long as it's limited, inoffensive, etc. Similarly, most companies state that the e-mail environment, and its content, are owned by the company, and reserve the right to review e-mail messages that their employees send and receive. Although, the company usually will only invoke that right when a problem or policy violation is suspected.

Along these lines, many organizations automatically add disclaimers to any e-mail messages that are sent outside the company. These disclaimers often assert the confidentiality of the message. But, many industries (e.g., financial, legal) may add statements pertinent to their field.

E-mail Archiving

With regulatory requirements like Sarbanes-Oxley, HIPAA, etc., along with discovery of electronic documents in litigation, finding and accessing specific e-mail messages is becoming a growing requirement. It's becoming increasingly common for the Legal department to contact IT and make a request such as "we need to find all the e-mails that anyone in the Comptroller's group sent or received during 2005 about the merger plans."

Although that seems like a simple request to the Legal department, it's a monumental amount of work for IT. First, we'll need a list of everyone in that department (don't forget people that might have left during the year). The users' online mailboxes are of no use since they no longer contain the items that were deleted. So, the backup tapes have to be recalled, individually restored, and then

searched. And, to do the search, someone in Legal is going to have to come up with a list of keywords that might indicate a message about merger plans.

Archiving solutions can greatly reduce the complexity of requests like the one used in this example. These solutions keep copies of all e-mails sent and received (based on rules you define), and they can easily be searched en masse. While the example above could easily take week or months to fulfill with the restoration and search of backup tapes, the same request could be done within a few days using an archiving solution.

In addition to a sophisticated indexing and searching mechanism, archiving solutions rely on “single instance” storage to reduce the amount of storage required. For example, if HR sent an e-mail to all 1,000 employees, the archiving solution would recognize this and only store a single copy of it (same with attachments) in the archive.

15.2 Directory Services

When a new user joins an organization, it’s common to find that they may need access to 10 or 20 applications. Sometimes, this means creating a separate account for each application—oftentimes, each with a different ID and password for the user to deal with.

Not only does this become an administrative nightmare for IT (going to each individual application to creating the appropriate IDs), a burden for the user (remembering the different IDs and passwords, changing them, etc.), but it can be a security risk to ensure that all the appropriate IDs are deleted when the user leaves the organization. The issues related to accounts and IDs is referred to as Identity Management.

Moving Toward a Single ID and Password

The goal of directory services is to greatly reduce the administration, user-burden, and security risk that can be associated with multiple IDs.

A directory service is essentially a system application and database that is used by all other applications. By using just a single set of ID and password credentials, called single-sign on (SSO), the user can sign on to the network, e-mail, and all the business applications they will need to access.

Table 15.3 Pros and cons of single sign on

PRO		CON	
	System administrators can now use just one set of administrative tools, and only have to go to one place to create, change, or delete users' access.		Applications may have to be modified to use and access the directory. This may be easy enough for in-house written applications, but may not be an option for third party applications you buy.
	When a user leaves the organization, his access to all systems can be terminated by simply disabling his ID in the directory.		For applications that are hosted externally, users may still need to use different IDs and passwords.
	Users don't have to remember different IDs and passwords for different systems, which may be complicated by different passwords rules (e.g., minimum length, complexity, expiration frequency) employed by each.		The directory usually needs to be modified or expanded to provide the level of granularity of control and access that is required for each application.
	Changes (e.g., a user's name change) only have to be entered once, as opposed to in each individual application.		There may be times when a secondary sign-on is an attractive security mechanism.

Single sign-on and identity management are also discussed in Chapter 13 (pages 366 and 367).

Directory Structure

Directories are set up in a hierarchical or tree fashion, very similar to an organizational chart. Some of the elements found in a directory include:

- ◆ **Objects (directory entries):** Virtually everything in a directory is an object. An object could be a person (i.e., user), a computer, or a device.

A directory “container,” which can hold a collection of objects, is also an object. Objects are often referred to as directory entries.

- ◆ **Organization unit:** This is comparable to a folder in a file system. It simply holds other objects, and may also hold other organization units.
- ◆ **Attribute:** Provides some specifics about an object. For example, if the object is a user, there could be an attribute for the user’s phone number. If the object is a printer, there might be an attribute for the printer’s IP address. Some attributes may have more than one value. In the case of a phone number attribute, it’s entirely possible that someone may have more than one phone number. An attribute type is the kind of information (e.g., phone number), while the attribute value refers to the specific content (e.g., 212-555-1212).
- ◆ **Objectclass:** Defines which attributes are required/optional and allowed in an entry. For example, the objectclass for a printer may indicate that the IP address attribute is allowed and required. Essentially, the objectclass defines the rules associated with different types of objects. A directory entry may be assigned to more than one objectclass. For example, a directory entry for a user may be assigned to objectclasses for an e-mail user, an employee, a T&E user, etc. And, each of those objectclasses would have attributes appropriate for its need.
- ◆ **Distinguished names:** A way of uniquely identifying an entry in the directory. It consists of the name of the entry itself as well as the names, in order from bottom to top, of the objects above it in the directory.

Directory Services Standards

X.500 and Directory Access Protocol

X.500 is a set of several standards for directory services, originally developed to support the needs of the X.400 e-mail standards. The X.500 is actually a series of 10 standards:

- ◆ X.500 Overview of concepts, models, and services
- ◆ X.501 Models
- ◆ X.509 Authentication framework
- ◆ X.511 Abstract service definition
- ◆ X.518 Procedures for distributed operation
- ◆ X.519 Protocol specifications

- ◆ X.520 Selected attribute types
- ◆ X.521 Selected object classes
- ◆ X.525 Replication
- ◆ X.530 Management for administration

The Directory Access Protocol (DAP) defines the standards for accessing X.500 directories. However, since the DAP and X.500 standards are so complex, a subset known as the Lightweight Directory Access Protocol (LDAP) has been developed and widely adopted.

LDAP

As indicated in the prior section, LDAP is a subset of the X.500 and DAP standards. A key differentiator between DAP and LDAP is that LDAP supports TCP/IP and DAP uses the OSI model as the transport/network layers. From the way the term is used, it would lead you to believe that LDAP itself is a directory (i.e., “let’s get that information from LDAP”). But, in truth, LDAP is just the protocol for *accessing* a directory.

The biggest benefit of LDAP is the ability to access the LDAP directory from almost any technology platform, and from LDAP-aware applications (either in-house-developed, or purchased from a third party).

The LDAP directory resides on an LDAP server, which could be one of several products available free as open source, or from commercial vendors. It’s also possible to use a relational database with an LDAP interface as the repository. Because of the cross-platform nature of LDAP, application vendors are eager to write the products to support LDAP, as opposed to customizing for proprietary directory services offerings.

Choices in Directory Services

A number of vendors have offerings for directory services. A partial list includes:

- ◆ Active Directory from Microsoft (<http://www.microsoft.com/activedirectory>)
- ◆ Sun Java System Directory Server from Sun Microsystems (http://www.sun.com/software/products/directory_srvr/home_directory.xml)
- ◆ eDirectory from Novell (<http://www.novell.com/products/edirectory>)

- ◆ OpenVMS Enterprise Directory from Hewlett-Packard (<http://h71000.www7.hp.com/commercial/edir>)
- ◆ Red Hat Directory Server from Red Hat (<http://www.redhat.com/software/rha/directory>)
- ◆ Tivoli Directory Server from IBM (<http://www-306.ibm.com/software/tivoli/products/directory-server>)
- ◆ Apache Directory Server from Apache (http://www.redhat.com/en_us/USA/home/solutions/directoryserver)

15.3 Enterprise Resource Planning

Enterprise Resource Planning (ERP) has a broad definition; it's used in a variety of ways to mean the set of activities that a company engages in to manage its resources across the entire enterprise. This can mean activities as diverse as product planning, sales programs, materials purchasing, maintaining inventories, and performing classically defined HR functions. Major software companies in the ERP space include SAP, Lawson, SSA Global, and Oracle. ERP is a hot topic in corporate circles. To avoid looking like the naïve ITer in a popular TV commercial, keep in mind that ERP is pronounced “E-R-P,” not “erp.”

Prior to ERP, companies would use different packages for various business functions: inventory, sales and distribution, financials, HR, and so on. Different packages were used simply because no vendor had a product offering that could cross all these various disciplines. The various packages might be purchased or homegrown. To pass data among the various functions, a company would write numerous interface programs to extract data from one application's database for use in another application.

The Value of ERP Software

With the introduction of ERP, a company can essentially have a single application (or a single set of applications provided by a single vendor) and database for all its vital business functions. The value of this can be enormous. Since all the applications are integrated, a change in activity in one area of the company ripples through the system to all affected departments so that they could react accordingly. A sudden spike in sales notifies the Purchasing department to increase orders of raw materials, the receiving department to look out for these deliveries, the manufacturing department to gear up for increased production, HR that more labor will be needed to fulfill the demands of the increased sales, etc.

ERP solutions for the supply chain (manufacturing, purchasing, logistics, warehousing, inventory, distribution, etc.) are a large portion of the market. Solutions for the supply chain often extend to include links and interfaces with suppliers and partners. ERP vendors also have different offerings for different industries.

General ERP Implementation Issues

There are several elements of ERP to keep in mind when considering implementing an ERP system:

- ◆ ERP isn't a trivial-sized activity. True ERP systems run across the entire enterprise and as such, they literally affect every aspect of a company's business.
- ◆ Because the scope of an ERP implementation can be so far reaching, it acts as a magnifying glass. Problems are quickly seen throughout the organization. And, problems no one knew about suddenly become very exposed.
- ◆ Implementation of an ERP system is a gut-wrenching experience for a corporation. Some companies thrive on the new system, embrace it as the salvation of their business, and explode forward. Others find the difficult medicine of ERP a very hard pill to swallow, and eventually bail in midstream, leaving unhappy employees, customers, and vendors screaming in their wake (to say nothing of opening the gate of lawsuits). Trade journals are equally filled with success and failure stories of companies that have gone through ERP implementations.

Costs of Implementing ERP

In addition to the upheaval an ERP implementation can cause, the cost of implementing ERP will easily be in the hundreds of thousands of dollars, and could go to the tens of millions for larger and more complex environments. Usually, the biggest costs of an ERP implementation are the consultants that you will need to assist in the implementation. Because of the complexity of installing an ERP package, it's common for consulting costs to total two to three times the cost of the actual software package. Many very large consulting firms (e.g., PricewaterhouseCoopers, Accenture, Ernst & Young) have entire divisions dedicated to ERP implementations.

In addition to consultants, a good portion of the budget will also go to training, support, and a large investment in additional hardware.

Major Changes Required

In many cases, the organization may find that it actually has to change the way it does business in order to implement an ERP package. While the traditional approach of implementing a package is to tailor it to your organization's needs, it's not uncommon to have to use the reverse approach when implementing an ERP package.

There are many core activities associated with ERP that are software related, although the thrust of the implementation is often not only software. It can include changing the way departments function, organization, procedures, employees' roles, and a sea of change in the way the company operates.

As the person responsible for a large part of the software and hardware health and well-being of the corporation, your job, your responsibilities, and your entire skill set are going to be radically affected by any ERP motions your company undertakes.

It Isn't Only IT's Decision

It's likely that you won't be the only one consulted before your company decides to implement an ERP system. Most likely, you will be part of a group or committee making that decision. Because implementing an ERP system is almost always a multi-year adventure, you will likely join a company in mid-implementation. Your decisions won't be "Should my company do this?" as much as "How can I help my company do this in the most efficient manner possible?"

ERP may be the single largest IT project your company has ever undertaken. Its success or failure may lead to the success or failure of many executives and departments. Stories abound of ERP implementations that led to enormous cost overruns, 20-hour days, 7-day weeks, loss of key team members, implementation delays, and more.

If you're involved in an ERP implementation, chances are you will be making more use of some of the topics in this book (project management, budgeting, etc.) than with any other project you'll ever be involved in.

You, as well as everyone else involved, should look at an ERP implementation as the single greatest opportunity to re-engineer the way your organization works, and to have a huge beneficial impact that will probably live on for many years.

Disadvantages to ERP

ERP isn't without its risk and detractors. There can be disadvantages and pitfalls to it.

- ◆ The very rigid structure of an ERP solution oftentimes makes it difficult to adapt to the specific needs of individual organizations.
- ◆ Because ERP software is enormously sophisticated, there is often a tendency to implement more features and functions for a particular installation than is actually needed. This drives up costs and may reduce usage if the system proves to be too complex to use.
- ◆ The cost to implement and maintain ERP systems is very high, and can challenge ROI calculations.
- ◆ Some departments and users may be hesitant to agree to the implementation if they feel they're giving up control of their data by switching from a department application to an enterprise-wide solution.

15.4 Additional Resources

Web Sites

- ◆ h71028.www7.hp.com/ERC/downloads/5983-2385EN.pdf (white paper on e-mail usage)
- ◆ www.brightmail.com (e-mail management vendor)
- ◆ www.eudora.com (e-mail software vendor)
- ◆ www.f-secure.com (anti-virus software vendor)
- ◆ www.ironport.com (e-mail management vendor)
- ◆ www.lotus.com (e-mail software vendor)
- ◆ www.mcafee.com (anti-virus software vendor)
- ◆ www.microsoft.com/exchange (e-mail software vendor)
- ◆ www.novell.com/groupwise (e-mail software vendor)
- ◆ www.oracle.com (ERP software vendor)
- ◆ www.radicati.com (market research firm)

- ◆ www.sap.com (ERP software vendor)
- ◆ www.ssaglobal.com (ERP software vendor)
- ◆ www.symantec.com (anti-virus software vendor)
- ◆ www.trendmicro.com (anti-virus software vendor)
- ◆ www.tumbleweed.com (e-mail management vendor)

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