Spreading Out: Why Internet-based software is the future of corporate computing

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If you are reading this article, chances are that you own a word processor. You, or someone in your MIS department, ordered that word processor from a large software company, who sold you a shrink-wrapped box that contained their product and a lisence. When the product arrived, someone installed the software on your computer, checked to make sure that it worked, and you were off. Of course, when the software company released bug fixes or 'patches', someone had to obtain and install those patches. And then there is the question of new versions, which now appear an average of every six months.

The larger the organization, and the more separate pieces of software, or *applications*, that organization relies on to do business, the more untenable this traditional model becomes. Modern companies move. A lot. Employees travel and telecommute, and even a small organization may have three or four offices, connected by email, phone and fax. This organization must support the software needs of every employee and office, regardless of distance and the complexity of those needs. Software that runs separately on each computer becomes a liability. In most MIS departments, managing the desktops of every employee is a tremendous problem.

Desktop-based software does not scale well, either: If we assume that the average professional uses a paltry three applications on their computer, and that a medium-sized business employs 20 staff, that company must purchase and manage sixty separate software installations, plus all of the required hardware. Combine that with the classic Mac vs. PC debate (every company has at least one person who refuses to bow to the masses, and wants a Mac), and even a small company can end up with an overly complex tangle of programs and platforms that guarantee a long-term maintenance nightmare. Grow that company

by a factor of 10, 100 or 1000, and you can see how some companies' information infrastructure simply collapses.

In computer parlance, your desktop or laptop computer is a *client* — we have come to rely on software that is installed on the client, and that reliance creates the problems I described above. The larger your company, the larger your staff, the more clients you have, and the bigger the container of Tums in your MIS manager's office.

There are programs designed to run on your network, so that multiple users share access to a single application. But staff in the field and remote offices have to dial long-distance to use the software. And, these programs typically share the maintenance bugaboos of their single-user relatives.

The rise of the Internet and Internet technologies provide a better answer: You can move some of the client applications to centralized *servers* — the software your staff needs runs on a single computer, and they access that software using their web browser. In the online vernacular, this approach called a *web application* or *Internet application*, and changes in the way companies work, combined with changes in the way software is developed, make them the future of computing in any fast-moving, adaptable organization.

What is a Web Application?

The best way to illustrate what a web application is is to compare it to the software applications we use every day. Take a standard scheduling/appointment program, as an example:

TRADITIONAL, DESKTOP

If you are using a standard, desktop-based scheduling software, you click the program's icon, and the software starts. The software runs using the resources of your computer: It occupies space on your hard disk drive, runs in your computer's memory, and uses the computer's processor power. The *platform* — the stuff the scheduling software needs so that it can talk to your computer — is your operating system.

The upside of having the software *on* your PC or Mac? Your computer is a world unto itself. Desktop computers are now extremely powerful, cheap, and reasonably easy to use — by installing software that runs 'locally', you make use of your computer's resources, and limit reliance on other computers to do your job.

The down side of having the software on your PC or Mac is that, well, your computer is a world unto itself. Every computer with local software must be maintained separately — all installations, upgrades and troubleshooting have to be managed on a computer-by-computer basis. Worse, each computer may be different: Users tend to install different bits and pieces of software on their computers, regardless of the most stringent corporate policy. Even the tiniest program may change the way one computer works, compared to another. That

means that troubleshooting each computer is a unique experience, and unique-ness is not high on your MIS department's wish list.

In addition, an organization has to purchase one copy of the software used for every computer. Plus, of course, upgrades.

Purchase cost, combined with maintenance, makes locally installed soft-ware extremely expensive. But, until recently, this was the only reasonable option.

INTERNET-BASED

If you were using an Internet-based scheduling program, rather than local soft-ware, you would access the program as a web site. To use the scheduling soft-ware, you would start your web browser and point it at a web site's *Uniform Resource Locator*, or URL (for example, http://myserver/scheduler). Upon arriving at the correct site, your web browser will display a web page that lets you use the software. From there, the application functions in the same manner as the local version, with HTML forms, graphical buttons and links replacing the traditional Windows or Macintosh-style interface. This interface typically connects to a database system, such as Access, Borland, Oracle or MS SQL Server. The platform, in this case, is the web browser.

In this example, all scheduling information, calendar data, appointments, etc. are stored in the database, and retrieved via the web browser as needed. The functionality can, if desired, be identical to the traditional version of the same software.

The difference is that the Internet-based application runs on a central, very powerful computer, or server, rather than on your computer. The only software required on your computer is a web browser. All of the data you enter into your calendar is stored on the server, rather than on your local hard drive.

Advantages

There are several major advantages to Internet-based applications: They all center around the fact that, unlike traditional software, these programs are run from a single location, and will work on any client that has a web browser.

LOWER HARD COSTS

The first and most obvious advantage is hard dollars.

An Internet-based application requires one, or at most a few, copies of the software used, regardless of the number of users. While you must still purchase licenses for the organization, there is no seat-by-seat overhead for the software company, and license costs should be lower than for conventional software. All the user requires to use an Internet-based application is a computer that is con-nected to the Internet or Intranet, and a web browser.

And this software runs on a single computer, or a centralized set of comput-ers. An organization can concentrate hardware dollars on very powerful servers — you can still keep clandestine Doom players happy with high-performance machines, but you no longer have to place a state-of-the-art PC or Mac on every

desk. If you purchase a new program that requires more memory or a larger hard drive, you can upgrade one computer, rather than every computer in your organization.

LOWER LONG-TERM COSTS

Internet applications do provide immediate, seat-by-seat savings. But where they really begin to shine is in the long-term. Upgrades, maintenance, troubleshooting and backups can all take place in a single location, rather than dispersed throughout the enterprise.

With traditional software, if a bug fix or 'patch' is released by the software company, the MIS department must see to it that the patch is installed on every desktop. Because it runs from the server, patching an Internet application is far easier — install the patch on the server, and the every user immediately receives the benefits of that patch.

The same model applies if the developer changes an Internet application. Once the changes are made and the application is updated, anyone connecting to the software via a web browser will use the updated version. MIS staff no longer have to update software on every desktop. The entire software maintenance process becomes transparent to the user.

Centralized updates eliminate another problem: Backward-compatability. Upgrades and new programs cannot always read and manipulate data files created by the previous software version. Traditionally, if you upgraded one piece of software used by your organization, such as your scheduling program, you had to ensure that *everyone* in the organization received the upgrade, and that anyone outside the organization who might need access to schedule information could access the new software's file type. The problems become more severe when upgrading operating systems: Will the new operating system support the existing scheduling software? Or will an upgrade to the OS also force the company to upgrade a host of other programs, at great expense?

Concerns regarding backward-compatability often prevent useful and necessary upgrades, because an organization cannot afford to struggle with the potential problems created by the upgrade. With an Internet application, the user's 'software' is the web browser. Any changes to the actual application are made at the server — anyone accessing that server is automatically using the best, newest version of the application. Backward-compatability is no longer a major factor.

Finally, organizations using Internet-based applications have far simpler backups: All data and program files reside in a single location, rather than dispersed across many desktop and laptop computers.

PLATFORM-INDEPENDENCE

You can view a well-designed Internet web page on any computer with a web browser: Macintoshes, PCs and UNIX workstations can all access the same information.

The same goes for a well-designed Internet application. Sticking with the scheduling software as an example, a staffperson with a Macintosh can access the application using Netscape or Internet Explorer and see the exact same inter-

face as a staffperson using a PC. The key to using an Internet application is the web browser, rather than the computer or operating system.

This means that, if your company has graphic artists on Macs, executives on PCs, network gurus on UNIX boxes, and even travelling salespeople on Windows CE palmtop computers, you can still provide everyone with access to the same software. As long as each person has a web browser, and some manner of access to the Internet or your corporate Intranet, they can use the application.

This may not seem like a problem: Windows is currently the dominant corporate operating system. However, the resurgence of Apple, the rising number of Linux users (currently, an estimated 7 million computers use this UNIX derivative, and some major manufacturers are now offering Linux as a standard OS option), and ugly politics all imply that Microsoft's dominance is coming to a close. Internet applications insulate you from gradual and drastic change in the OS landscape, because the 'container' for the software is not a specific operating system. Rather, the web browser provides the platform for the application, and web browsers exist for every major operating system.

Internet applications allow access by a multitude of hardware and operating system configurations.

LOCATION-INDEPENDENCE PLUS UP-TO-DATE INFORMATION

The Internet allows you to view the same web pages anywhere you have a phone line and an Internet connection. The same rule applies to Internet applications.

Your Internet application can be accessible to staff and clients anywhere in the world via a standard Internet connection. You can secure the application using a simple password scheme, or more powerful Virtual Private Networking or encryption systems. In either case, your sales force in Indonesia can review minutes from yesterday's meeting in London with a local phone call, whether it is 12 noon or 2 AM.

Imagine a secure Internet application that handles your company's inventory. A salesperson in Wisconsin can instantly verify that you currently have 400 units of widgets in stock, and close the deal, even if the main office is closed. That salesperson can enter the order using the same system, so that other staff have up-to-the-minute inventory information.

And all of this can take place using a local Internet access line, eliminating long distance and 1-800 charges. When they switch to Internet applications, many companies realize tremendous returns in reduced phone and fax bills alone.

This separates Internet applications from traditional networked software packages. While many programs can be installed and used on an enterprise network, none allow complete access through the Internet.

DESIGN

Internet applications are by necessity one-third programming, one-third design, and one-third document. The developers who create them are better capable of creating effective, user-friendly apps than ever before — the tools they use, and the discipline required to use them, require well-rounded geeks. The Internet

application products you use will be easier to understand, and more intelligent, than their traditional counterparts.

The Possibilities

Internet applications are inherently more flexible than their traditional counterparts, and the possible permutations are endless. Some examples of applications we have designed include:

- Adapting collections of paper forms for online use, so that staff can complete common paperwork electronically and reduce rekeying of data.

- Streamlining existing corporate systems, such as employee evaluations, benefits enrollment and sales fulfillment, by combining tasks performed by several programs into a single Internet application.

- Moving project planning and collaboration online with scheduling, discussion systems, document archiving and other services.

- Insuring staff access to important information through Internet-based document libraries and search engines.

- Automating catalog, specification and invoice generation.

Internet applications can be useful any time you need to collect, organize and redistribute information. All of the examples listed above had a common requirement: There was a formerly dispersed body of information that needed to be consolidated, organized and stored. Whether that information is already in document format, or exists only in the brains of your employees, intelligent use of Internet technologies can simultaneously collect and spread the wealth.

Issues

Internet applications are different — they combine the properties of traditional desktop and networked apps, and they add a few new twists. Because of that, there are a few issues anyone should consider before moving to these new systems:

IT'S THE PARADIGM, STUPID

Compared to traditional software, Internet applications embody a very different way of thinking. Internet apps are not 'shrink-wrapped'. Even if they come in a pretty box, someone, somewhere will have to perform some customization to make the software work just right. While other reduced costs more than make up for the cash implications, look out for dazed MIS staff wandering the halls.

More important, most staff in your organization are probably used to having *their copy* of Schedule +, Project or Act!. Internet applications may take away some of their control over how their software behaves and looks. Some staffers

may be thrilled at the prospect, but others may start calling you Bligh behind your back...

BEWARE PERFORMANCE

By their nature, Internet applications concentrate load on a single computer or set of computers, rather than on the computer of each user. Make sure that your servers can handle the traffic. If the company that sells you the Internet application can't provide you with information on this subject, don't buy their product.

Expect your network infrastructure to get more traffic, too. The routers, hubs and network cards used by most companies are more than capable of handling the increased information flow. But if you have 10000 employees, and they all suddenly triple their network time, your company's circulatory system may have an aneurism. There are ways to manage this without replacing hardware, and planning ahead will save a lot of heartache.

SECURITY

Many organizations see the Internet as the high seas of yesteryear, with pirates, foreign powers and privateers plying the sea of information, boarding hapless merchants and laying waste at will. Aaaaarrrrrr....

Information on a server can be protected, just as information on a desktop computer and paper in a safe can be protected. There are security issues, and these issues are unique to the medium. But you can thoroughly protect your data — tight security may actually become easier, as you can prevent employees using Internet apps from taking contacts lists, evaluations and contracts home on floppy diskettes. Don't let the hysterics discourage you from using information more effectively.

Conclusion

Will our web browser soon be the only software on our desktop? No. Powerful, unique applications such as graphic arts and design suites will probably remain on the desktop for a long time.

But the applications and systems your organization uses to share common information and complete daily tasks can benefit from Internet adaptations. You can reduce or eliminate a host of different expenses, and make it easier for members of your organization to access, update, and use information vital to their work.

And the use-anywhere, platform-independent nature of Internet applications may just eliminate a common 'I-can't-work'today' refrain: An employee with a cranky computer will find herself at home, grumbling as she completes her daily invoices by modem.