Web 103: The Lazy Person's Guide to Intranets

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An Intranet is a computer-mediated communications infrastructure based on Internet communication and content standards with access limited to clients in a particular institution or community. Many organizations have an Intranet, are installing an Intranet, or are considering an Intranet. This article covers some of the basics of Intranets and how to make them more than just expensive window dressing for your desktop systems.

INTRANET, IN´TRA NET´, n. 1 A computer-mediated communications infrastructure based on Internet communication and content standards with access limited to clients in a particular institution or community. 2 A cancerous proliferation of hypertext markup language files. 3 Organizational Excedrin Headache No. 8879.

Chances are your organization has an Intranet, is installing an Intranet, or is thinking about installing an Intranet. This article will cover some of the basics of Intranets and how to make them more than just expensive window dressing for your desktop systems.

Intranet Basics

As noted in the definition above, Intranets are based on Internet communication and content standards. What distinguishes an Intranet from the World Wide Web is that access to information published on an Intranet is restricted, usually through the use of local area networks protected by fire walls. They are not limited to a single physical network and may span many networks at various locations.

There are four key roles associated with Intranets: users, authors, publishers, and brokers. People may assume any of them in the course of their work.

User Issues

Users benefit from the content of the Intranet. This is the group for whom we must design, as they are the reason the Intranet exists. While this is an easy group to define, it is rarely an easy group to satisfy. Users will have a wide range of needs and capabilities. A system simple enough for the first 80 percent of the population will rarely satisfy the top 20 percent. A system designed for the top 20 percent may be too complex or frustrating for the rest of the world.

This article is based on "The Lazy Person's Guide to Intranets," Chips, *January 1998. For reprint permission, contact* Chips *at http://www.chips.navy.mil.*

Authors

Authors create content and structure. Content is the information itself, usually presented as HTML files, word processing documents, spreadsheets, or database reports. Structure defines the information relationships within and between various forms of content.

In traditional publishing, content and structure are most often absolutely linked—the author has complete control over the linear nature of the information and how it is presented.

However, content changes in a hyperlinked model. Instead of republishing information, authors can merely link to other documents. The less duplication of information, the less maintenance required to synchronize various information sources. Linked, reusable modules of information combined with nonlinear, cross-referential structures will radically transform how we use and maintain information.

Structure has also changed because of hypertext publishing. Hyperlinks let users pick and choose the information they wish to see and in what order. Good hypertext authors will develop structure that helps users determine which information is most valuable for their current need instead of locking them into the more traditional "I'm the author; I know best" linear model.

As a rule of thumb, design simple information structures. Even Nobel Prize laureates probably would not appreciate having to hunt through a complex, arcane set of hyperlinks to find what they need.

Publish or Perish

Publishers make information available. They manage, coordinate, and communicate content in (I hope) predictable and efficient ways. They determine which content is most appropriate for their organization, what structures through which to present it, and how to manage its lifecycle.

In the digital environment, publishing no longer means presenting a static representation of information. Electronic publishers have a far greater reach and scope because of the variety of content available and the speed at which they can disseminate it.

However, publishing is a part of our traditional organizational bureaucracy that we established, developed, and maintained to deal primarily with paper-based information. Unfortunately, most of our bureaucracies and organizational processes are little more than mechanisms to move information on paper, not to manage the information itself.

The digital environment presents new opportunities and challenges in this regard. Digital mechanisms, like E-mail and Intranets, threaten to break down those established bureaucracies. Naturally, they resist, the result of which is that Intranet publishers frequently end up merely transplanting old paper process "sacred cows" into their digital enterprises.

If you are a publisher, resist this. When moving operations from paper to digital environments, rigorously examine every information process you own. If you can automate a task, e.g., assigning sequential numbers, do it. If you can bypass information choke points without bringing your organization to a standstill from information overload, do it.

Shoot some sacred cows. They usually make the best hamburger.

Publishers need different information structures than users to help them manage information content. The most important of these structures is an information map that describes their content, where it resides in the system of information, its relationship to other content, and the rules for access. Without a good map, an Intranet can quickly become an indecipherable Gordian Knot of bad links, obsolete information, and other useless junk.

Brokers

Brokers help us find information. This is true in both the paper and the digital environments. Understanding how brokers work will become increasingly important as we adopt Web technology, which allows prolific, independent creation of information well beyond our capacity to find and use it for specific needs.

Commonly used paper information brokers are the telephone book, bibliographies, and indexes. Librarians, researchers, and political pollsters broker information. A good information broker is ubiquitous. If it works well, we hardly notice it. Polls, for example, are everywhere. But do we even notice the mechanisms used to produce all that information we are bombarded with daily?

Where Web technology is having its greatest effect is on brokering access to information. A crucial feature of on-line brokers is that they deliver information access pathways instead of just documents. Digital brokers can search for and screen vast amounts of information in a relatively short period.

This radically alters the focus of the information broker. A paper document might come as 50 pages of text and graphics. On the Web, however, a document may be a single page with content and hyperlinks. The authors probably created those documents by editing together information from other documents using brokers.

With more advanced Web technology, we should be able to build brokers that understand users' decision processes and structure access paths to appropriate content to better support those decisions. We are not talking about another application like PointCast, here. The goal should be to develop autonomous intelligent agents that search for what we need across the entire infosphere, not just download simple, pre-programmed content.

Adapt and Evolve

Military organizations have been struggling with some increasingly complex information management issues for decades. A major issue is the seemingly constant increase in the amount of information we have to deal with every day. If we do not find some way to harness and control our ballooning information stores, we will eventually reach a point where we are no longer able to make effective use of everything we gather or produce. If we have not passed that point already.

The most basic visible effect of this is called a surface-to-volume ratio. Imagine the sum total of our organizational information resources as a sphere. The surface area represents the amount of information we have to deal with every day. The volume represents the infrastructure (people, equipment, and process) required to support our information production and consumption.

In a normal sphere, as the surface area increases, the volume also increases to support the larger surface area. To do this, the volume must increase twice as fast as the surface area.

To use a more common metaphor, our infospheres are more like basketballs. The larger the ball, the greater the surface area and the more infrastructure support (air pressure) it requires to stay inflated and useful.

Increases in infrastructure also usually increase inertia. As a system or organization grows, it acquires mass. More mass means more effort required to change anything, as "a body at rest tends to stay at rest."

If we build a large, complex infrastructure, we will require more coordination to make decisions, have more layers through which information passes, and need more people to manage the whole system. Decision makers at the center of the sphere must deal with an increasing number of competing inputs, which can be confusing at best and debilitating at worst.

Our surface area, the information we need to do business, must have the volume to support it. Without that volume, the surface of our sphere will collapse, much like a basketball without enough air.

And our information surface area is increasing every day.

Pump Up the Infrastructure

Earlier, I mentioned three components of our information infrastructure: people, equipment, and process. Let us examine some of our options for building more support for our information needs:

Option No. 1: Hire more people.

Chances of this are just about nil nowadays. But we can always dream.

Option No. 2: Add more equipment.

We are doing this now, but you cannot solve a business problem just by throwing technology at it. While extensive computer and network infrastructures are becoming an essential part of military life, they also are one of the primary reasons we are becoming overwhelmed with information. We are now dealing with volumes of information well in excess of what our current organizational systems were originally designed to handle.

Option No. 3: Change our processes.

This is where we must focus if we intend to survive and prosper. It sounds like a simple answer, but it is not. Processes acquire inertia, too, and it usually requires a significant amount of effort to make any substantive change to them.

Although technology cannot solve our problems by itself, we absolutely do need more advanced hardware and software to support these essential process changes. However, we must ensure that we are applying the right technology to the process and that we are changing the process in the right way.

A famous example of process paradigm shift (and lack thereof) occurred when the photocopier was first invented. Two of the biggest manufacturers in the office automation world of the day passed on buying the rights to the technology. Their reasoning?

Photocopying was too expensive to replace carbon paper, which was, at that time, the standard way to make copies.

The people who accepted that rationale were stuck inside a fairly narrow box in which carbon paper was the main way to make copies. However, xerography was not intended to mirror the process of producing copies at creation but to allow reproduction after a document had been created.

We know all about how ignorant they were back in the dark ages when computers still used vacuum tubes. But how many of our opportunities today look the same way to us?

So, we need some fairly radical process change fueled by an infusion of technology that supports organizational and personal use of ever-growing volumes of information. And we have to do with fewer people every year.

There are no simple answers to this problem, but we can always hope that someone else will invent the "next big thing" and solve our problem for us.

However, hope is not a strategy.

We already have the technology. We just have to find the will to employ it.

Why an Intranet?

Intranets allow organizations to restructure their information operations to allow distributed, rather than central, management of information and decision making. This is a significant change in thinking in some circles.

Organizations succeed by leveraging the benefits of coordinated activities. In highly successful organizations, members at each level become self-regulating and standardized; they share the common organizational goals and purposes, and any energy that was previously devoted to regulation or control may now be redirected to production.

Complex organizations composed of self-regulating subsystems should be more responsive than monolithic organizations of similar size because the smaller, semiautonomous parts will react faster to the same stimuli.

It is something like boiling a potato.

Divide and Mash

Take two potatoes of equal size. Cut one into one-inch chunks, and leave the other whole. If you drop them both into boiling water, the small chunks will cook much faster, which means your potato reaches the desired end state much faster. Why do they cook faster? Because they have a much smaller surface-to-volume ratio.

The center of the potato is much closer to the surface in the small chunk than it is in the large one, so it cooks faster. In a distributed organization, the decision-making elements, the centers of the chunks of the organization, are closer to the information they need, have less infrastructure to wade through, and can react faster in coordination with other organizational components to get the job done.

The processes we use for communication and coordination among our self-regulating organizational components will determine our ultimate levels of performance. Our current processes of communication and coordination, however, are still anchored in paper-based approaches, even where we have transferred the information to digital media.

Unfortunately, we have probably reached the limits of size and complexity that we can support with a paper-based communications infrastructure. It is no longer just about building large computer networks; it is managing organizational information resources. We must build comprehensive information infrastructures that will allow us to create more agile and more responsive organizations.

The Role of the Intranet

Intranets, along with E-mail, databases, and other technological marvels, will help redefine what we consider high-performance organizations. Each has its uses.

E-mail is great for point-to-point communications. Databases crunch critical mission data and presents structured results. Other components, like imaging and work-flow, have their places, too. Where does an Intranet fit in with the information infrastructure?

First, it is a private publishing medium. The first thing that most organizations do is build their Intranet around their organizational hierarchy and fill the server with mission and vision statements. Although this is not a particularly productive use of hard-drive space, it does not hurt and usually generates a "warm fuzzy" effect for everyone who sees their name or their organization's name up in hyperlights.

The first real value you accrue from an Intranet is relatively universal access to functional information that crosses traditional organizational boundaries. This will usually be the second set of pages authors generate. You may, if you wish, reference your entire functional knowledge store through both the Intranet's formal structure (home pages) and an indexed search. This facilitates a whole new level of information sharing between organizational subunits and individuals.

Note that I said Intranets are private, not secure. While all this access is good from a sharing standpoint, it also means that a lot more people may now easily replicate and distribute whatever is out there. There are still some types of information that, while we want to facilitate sharing, we do not want to share with everyone.

One of the greatest barriers to effective information sharing is not that people are not allowed to see information, but that they do not know it exists. However, there is a happy medium. You can publish pages that contain links to sensitive files, but further restrict access to those files at the system level.

Home pages and index searches should show all the documents that are available through the system so people know what they may be missing. But control of the individual files should still belong to the authors and publishers responsible for that information. If files need protection, protect them. But do not miss out on the benefits of Intranet access by withholding potentially important documents from the common repository.

Intranets also can function as an access shell as part of a three-tiered computing architecture.

The classic two-tier client-server computing model separates presentation and calculation from data. The data sits on the server, and the client performs the work. This was the original model for most client-server networking.

However, there were some problems with enterprise-wide two-tier architectures, particularly when you tried upgrading an application or distributing load

processing. Three-tier architectures, which separate by presentation, business operation, and data, are more common now.

In a three-tier system, the bottom layer is the data. The middle layer holds all the network applications that work with the data: databases, work-flow engines, indexing systems, imaging systems, etc.

The top layer, presentation, is what sits on the client's desktop. In the past, much of the presentation layer has been monopolized by proprietary interfaces dedicated to a limited set of functions. If you wanted to talk to the database, you had to use one interface. If you wanted to read word processing documents, you had to use a word processor. Every data type has an associated application, and the only overall representation of your information repository was through a file manager or viewer of some type.

Now, however, one of the most prolific client applications is our Web browser.

This is a good thing for three reasons:

First, Web browsers are fairly universal. Even with all the contention about the next HyperText Markup Language (HTML) standard between vendors, you can often bring up someone else's HTML page. In addition, browsers are rapidly gaining the ability to read non-HTML files via plug-ins or associated applications. Views of the information repository are no longer limited to how file structures are arranged thanks to Web publishing mechanisms.

Second, access through a Web browser is as simple as clicking on a hyperlink. The learning curve is not steep for most users.

Finally, you can administer all the information in the Intranet either centrally or remotely. Webmasters can help less accomplished authors and publishers get their information out. More experienced authors and publishers can manage their own chunks of the system independently as part of a distributed but coordinated component of the total information infrastructure.

There are other applications that can provide this type of functionality, but most of them are expensive, proprietary, and dying out because of the ease of use of browser technology and the relative simplicity and power of HTML. Good ideas can spread rapidly on an Intranet, too. One author's great HTML can be immediately copied and replicated throughout an organization in a relatively short period.

Sharing is good.

Rules to Live By

This last section covers a few rules you should establish for your Intranets.

First, strike a balance between organizational and functional content areas. Every organization should probably have its own set of "we love us" pages. However, that is not where you will get a substantial return on your investment.

The public library card catalogue, still one of the most functional retrieval systems ever devised, sorts by author, title, and subject. Organizational pages are our equivalent of an author search. If you know who published it, you can find your information. But if that is all you have, you only have one-third of the brokering capability your users need.

Index searching is a valuable tool. Spend time on training users how to conduct Boolean searches. It is well worth it to the entire organization.

Functional managers, including those running ad hoc or temporary groups, must create a presence for their content on the Intranet. Personnel news, social events, organizational policy, and a host of other information should not be buried deep in some branch's organizational page. Put what is important to the entire organization at the highest levels, regardless of where the author sits in the formal hierarchy.

Second, do not hold back on content. Hard drives are inexpensive, and index engines are getting better every day. If we have good brokers on the system and we train people how to use them, we can exponentially increase the amount of useful information available to our organizations. Restrict access to what you need to, but do not hide something that exists unless its existence is supposed to be a secret.

Third, try to keep the junk and bandwidth hogs to a minimum. If a lot of your population is still using 486/33s, do not let authors stick huge, spinning, three-dimensional, animated, 1 megabyte graphics that take a full minute to load on their home pages. Graphics are good, but some are just gratuitous.

Fourth, enforce your standards. Few things can get out of control faster than an Intranet, particularly if all those distributed authors and publishers have different visions of how things should be. In my earlier endorsement of distributed, decentralized decision making, I mentioned coordinated activities, which means standards, standards, and standards.

Fifth, review all pages at least monthly for currency. Nothing debilitates an Intranet like link rot. Dispose of obsolete information, but make sure you have some provision to archive any electronic files that may qualify as federal record material.

Finally, if authors or publishers rename, delete, or move pages, they should create and maintain a notice page indicating what happened to the old page and provide a hypertext link to the new page. Keep these notices up for at least 30 days.

Final Words

> "Technology is a way of organizing the universe so that man doesn't have to experience it."
>
> — Max Frisch

If that is so, maybe Intranets can be a way of organizing our infospheres so we work less on information and more with it. ◆

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