INTRANETS AS A TOOL FOR COMMUNICATION, COLLABORATION AND KNOWLEDGE MANAGEMENT

by
Hannah Rains Toney

A Master's paper submitted to the faculty
of the School of Information and Library Science
of the University of North Carolina at Chapel Hill
in partial fulfillment of the requirements
for the degree of Master of Science in
Information Science.

Chapel Hill, North Carolina

July 2001

Approved by:

_____

Advisor

Hannah Rains Toney. Intranets as a Tool for Communication, Collaboration and Knowledge Management. A Master's paper for the M.S. in I.S. degree. July 2001. 19 pages. Advisor: Gregory B. Newby

This paper explores intranets, one of the most widely adapted information sharing tools in today's corporate world. As the economy moves more and more towards an information economy, the way we organize our information becomes more and more important. Intranets are information systems that capture and present an organization's knowledge base. In this paper, the term intranet is defined and its parts explained. Challenges faced by today's intranets are also examined. This paper shows that intranets facilitate communication, collaboration and knowledge management.

Headings:

Intranets

Web Portals

Web Sites

Table of Contents

Introduction

The use of intranets has been rapidly growing worldwide over the past seven years. Intranets have become an almost standard part of any business organization. As such, the exact role they play in the corporate culture should be examined. This will not only provide a better understanding of intranets as information sharing tools, but will also help to provide a set of goals for current intranets.

This paper will define intranets and examine how they facilitate communication, collaboration and knowledge management within an organization. The first section of this paper will give a working definition of intranets and their components. The second section will investigate how intranets facilitate communication, collaboration and knowledge management. This section will also provide an example of an actual intranet and its components. Next, some of the challenges intranets face will be explored followed by a look into the future for intranets. In conclusion, I will look at how intranets change the way people work and what this means for the changing corporate culture.

What is an Intranet?

First of all, we need to come up with a working definition of the term "intranet." One of the first uses of the word was by William Safire in his column in the New York Times in early 1994 (Guengerich, 1). Guengerich et al define an intranet as "a corporate network and the business applications that run on it that share the 'DNA' of internet

computing technologies (e.g., Internet Protocol, browsers, Web servers) and exists behind the corporate security 'firewall'" (2). Lai defines an intranet as "a communication tool supporting collaboration, interaction and real-time sharing of corporate information across functional boundaries and organizational levels" (95). Mellanie Hills, in her book Intranet Business Strategies, makes a distinction between *internal webs* (internal web servers and browsers) and *intranets*, which she defines as "the larger environment inside the organization, made up of the network, internal web, e-mail, newsgroups, mail lists and other Internet tools and technologies" (xiv). Based primarily on Hills' definition, the working definition of an intranet will be an internal system that brings together all aspects of an organization's information systems to allow sharing of information as well as computing resources, in an easy to use and familiar interface.

What is involved?

An intranet is an internal private network. This private network is contained by a firewall, a barrier that protects the network from outside users and other networks. Often, intranets allow access out to the Internet through the firewall, usually through a proxy server. A proxy server sits on the firewall and directs packets in and out of the organization. A virtual private network (VPN) is a private data network that uses the public telecommunication infrastructure while maintaining privacy through the use of tunneling protocol and security procedures (Whatis.com). Some companies use a VPN for their extranets and intranets.

An intranet uses Internet technology. There are four standards used by intranets, TCP/IP, HTTP, HTML, and Web Browsers. There are one or more web servers that make up the internal web portion of the intranet. These web servers house the HTML

pages. In some cases many other data types are stored on the web servers as well, such as spreadsheets, documents and charts as well as desktop databases, such as MS Access. Some organizations choose to store these other data types in separate content management systems, accessible via the intranet. An intranet will also include database servers (such as Oracle or SQL Server) and other application servers as well. One example of another application is Lotus. Access to Lotus databases through a web interface are served off of a Lotus application server, and linked into the intranet. Lotus also supplies the email and calendar tools for many intranets. Most intranets have a main gateway or homepage that contains links to these various stores of information. This is the common entry point for users.

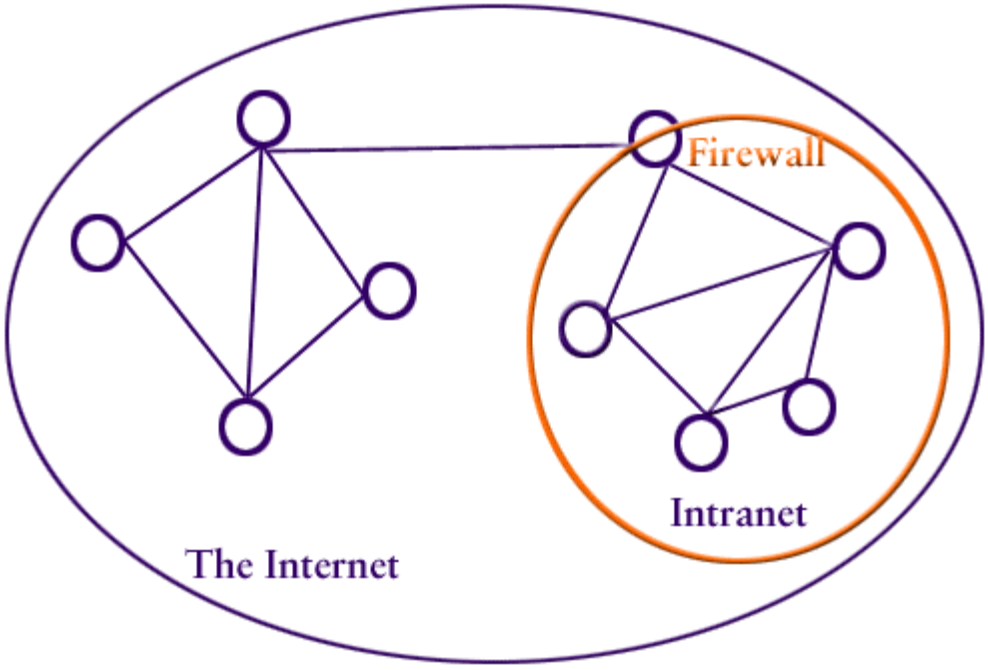

Figure 1. Schematic of an intranet protected by a firewall (Scheepers 10)

Of course, an intranet is much more than its architecture. Just like any other information system, there needs to be planning in how to implement it and a plan to maintain it. Not only will there need to be administrators to maintain the web server,

more importantly, there will need to be administrators in charge of maintaining the content. The purpose of an intranet is to provide immediate access to an organization's knowledge base. This information needs to be current and appropriate. This is only achieved through a successful content management plan.

History of the Intranet

Intranets first appeared in 1993 (Laalo, 64) but did not become truly widespread until 1996. It was in 1996 that literature on corporate intranets started to emerge. The "true" beginning actually goes back a few years further. Tim Berners-Lee proposed the first intranet in 1990, for CERN. He proposed a system that would allow people to:

- connect to various electronic conferencing systems
- view an online employee telephone book with links to people, projects and office addresses
- construct a "Personal Skills Inventory" listing projects and areas of expertise
- access documents linked by categories and projects, keywords and authors
- read newsgroups and create links from one newsgroup to another
- share key learnings at the conclusion of projects
- search the system for information
- generate mailing lists to keep people informed of changes.

Therefore, not only was Berners-Lee the father of the Internet, he was also the father of the intranet as well (Gonzalez, 20).

In 1997, 60% of intranets were used for "static information retrieval – policies and procedures, marketing literature and other online information. (Miller 2). At the same time, 80% were only departmental. In 1998, the IDC reported that 89% of large companies and 54% of medium-size companies have intranets. Only a year later, the

META Group reported that 95% of G2000 (top 2000 companies worldwide based on revenue) companies have intranets.

Benefits of an Intranet

We have defined intranets as an internal system that provides easy access to an organization's knowledge base and looked at how they have grown over the past decade. But what does an intranet really provide to an organization? Intranets have become mission critical to many organizations because they facilitate communication, collaboration and knowledge management.

Communication

Organizations have changed significantly over the past few decades and are becoming more decentralized. This brings an even greater need for effective communication (Guengerich 16). Many employees telecommute and many organizations have locations worldwide, with employees working in different time zones. How do you keep the feel of the corporate family, which is so important in today's corporate world? Intranets provide the support for cross-functional communication. "These evolving relationships start breaking down the functional walls and create more communication among areas" (Hills 67).

One way intranets facilitate communication is by providing consistency. Through an intranet, "leaders can communicate directly to all rather than going through layers of management" (Hills 60). A basic truth of communication is that the less duplicated a message is the less distortion there is. By providing a means for direct communication, intranets cut down on distortion of information.

An intranet also supports online publishing, and therefore reduces the time it takes for employees to find and use common forms. You might find corporate policies or manuals on an intranet as well as time sheets. Online publishing significantly reduces cost for a corporation by eliminating the need for much of its printing budget. Not only is cost reduced, but also corporate communications can be distributed universally and immediately. Intranets also increase the availability of information, making it accessible at any time of the day (Hills 61).

One major benefit of an intranet is that it is accessible through a web browser, which is a familiar tool, requiring little or no training. Successful communication requires some level of common ground. With the Internet being so widely used, it has become the perfect common ground. By using web technology to deliver information, intranets also have the benefit of being available from just about anywhere. Users may also dial into their intranet from remote locations, facilitating a dispersed work force. An intranet is also user friendly because it presents information with a *consistent look and feel*. This aids communication as well.

Collaboration

In today's world, where information is king, collaboration is essential to organizations. Problem solving, brainstorming and sharing creation are all types of collaboration. Teamwork is a part of every organization today. Intranets help provide both synchronous and asynchronous collaboration tools. Examples of synchronous collaboration tools are chat rooms and shared virtual desktops (Collins 39). Having shared workspace online and bulletin boards provides asynchronous collaboration. With

team members widely dispersed throughout the organization, and often across the globe, collaboration on-line is an invaluable asset to organizations.

So how does an intranet compare with groupware, the traditional collaboration tool? Groupware is software that allows collaboration and the sharing of information inside an organization. An intranet is web based while groupware uses a special application. Therefore, anyone using the groupware also has to have the application as well, while intranets use web browsers, which users already have access to. An example of groupware is Louts. Lotus provides email and discussion databases as well as other collaborative tools. Initially, these tools were only accessible through a Lotus application and were a competitor to intranets. Now, Lotus is seen as a compliment to an intranet (Carlson, 34). Lotus databases are available online and many intranets link directly to them. This way, a user does not have to have a Lotus client or license to make use of the resource.

Knowledge Management

Knowledge management can be defined as the ability to capture, store and distribute knowledge. Robinson writes that "knowledge management requires the identification and uniting of a vast range of data sources, most of which are not published in the traditional sense" (95). Through successful knowledge management, information overload can be avoided and users can find the information they need when they need it. The intranet is a perfect tool for organizing and presenting this "vast range of data sources."

One way that intranets facilitate knowledge management is by supporting online training and learning. This is an invaluable tool for a worldwide corporation. Training

can be provided online so that employees may access it whenever it is convenient. Intranets are also the perfect forum for competitive intelligence, which is important to any organization. Data gathered about an organization's competitors can be presented on the intranet securely.

Perhaps most importantly, intranets provide access to every corner of an organization and therefore create a more holistic view of the business environment. This also allows greater access to experts within an organization (Laalo, 69). Laalo also writes, "by radically changing the range of communication for individuals, from their immediate workgroup to the entire firm, organizational knowledge is leveraged and dispersed" (69). Intranets help organizations to *know what they know*.

An Example: BDOne, BD's Intranet

Becton Dickinson (BD) is a medical technology company with more than 20,000 employees worldwide. When BD launched its intranet, BD*One*, in 1997, it started out as a research and development tool. It provided online access to databases such as BDXpert (the technology expert database), Materials Database (information on materials used in product development), BD Patents Database (all of BD's patents), ProMIS (the Product Master Information System), and the Trip Reports Database (gathers information on trips to conferences by BD scientists).

The following summer, the Asia Pacific intranet was launched, which served as a gateway from BDOne. Eugenio Naschold, President BD Asia Pacific, was one of the primary supporters of the project. He says, "The subject of insufficient communication seems to surface in every conversation that we have with employees when debating about

implementation of company values. The initiative to start with a simple intranet can be seen as a good step towards improving communications in our organization."

While BDOne started out as a tool for research and development, Asia Pacific's intranet provided information on their organizational structure, announcements, and financial performance. Today, BDOne has grown into an overarching intranet, with links to regional and business unit sites. Though it started as a repository for R&D information, BDOne now links to every aspect of work at BD. Employees can enter their time sheets online through SAP. Business units can buy supplies online through eBuy. Employees can complete their required quality training online through online tutorials. All corporate announcements are posted on the BDOne home page, which is updated weekly. BD*One* has proven to be a communications tool that will facilitate knowledge sharing throughout the company and help foster innovation.

Challenges

Just as with any information system, there are challenges intranets must face. Listed below are a few of these challenges.

Security: An intranet contains information that is confidential to an organization. Therefore, this information must be absolutely secure and not shared outside the company. The intranet is secured by a firewall, and this system must be maintained and periodically checked for breeches. Also, associates must be made aware that the information found on the intranet is internal information. A reminder such as, "For Internal Use Only" is often placed on intranet pages. This is another reason many

intranets have a standard look and feel (such as a standard header and footer.) This way, users always know when they are on an internal web page.

Usage: So you've got this wonderful intranet that connects the organization's information and computing resources. What if no one uses it? An intranet has to be utilized to make a difference. Many builders of intranets have the mentality of "If we build it they will come." This is not necessarily the case. Having the intranet supported by upper management is one way to get associates to use it. At BD, the CEO, as well as the CIO, often speak of how useful the intranet is when addressing associates. All of the CEO's announcements to BD associates are made on the intranet. Many organizations choose to move resources to the intranet, therefore encouraging usage. This is seen with corporate newsletters that are provided in electronic format rather than in print.

Making it last: To ensure the longevity of the intranet, you must have a corporate taxonomy or metadata scheme as well as content creation/management processes. Content management (mapping out the processes, defining roles and permissions and establishing workflow for approval and submission) is essential for a successful intranet (Rogers, Part III). Content management tools are important so that the owners of the content are the ones making the information accessible, and not a Webmaster. This way, information is owned by the appropriate group, and by using a content management tool; those owners are not required to understand HTML. Rogers writes, "the goal is to put content control in the hands of the content experts, not turn them into web gurus" (page II).

The challenges that face intranets are not uncommon to those of any information system and must be seriously addressed and planned for.

Future for Intranets

The growth of intranets has been phenomenal. Today they are used by an estimated 133 million (IDC). IDC also believes that the corporate intranet will become the standard infrastructure companies use to communicate and conduct business transactions (META group). As intranets continue to grow and thrive, they are spawning new applications, such as the portal and the extranet.

Portals: A portal is essentially an expanded intranet. A portal is a website that serves as a single access point to a company's information and knowledge base for employees. Various applications are launched in the browser. For example, a user would have access to his or her email directly in the browser window. Portals use software that manages role-based, end-user access to multiple applications and services. The key difference between an intranet and a portal is that the portal is customizable through role-based access. Users can create their own portal interface; keeping the sources they use the most close at hand. Heidi Collins' definition of a corporate portal is "a browser-based application that allows knowledge workers to gain access to, collaborate with, make decisions, and take action on a wide variety of business-related information regardless of the employee's virtual location or departmental affiliations, the location of the information, or the format in which the information is stored" (7.)

Extranets: An extranet is an extension of an organization's intranet that is made available to customers and partners. It securely shares part of an organization's information with outside users. An organization might provide access to an extranet for one of their clients. The client would be able to securely log on to this site and access information from the organization, such as product information, or training. This type of service is growing rapidly and is being used as a value-added service by many organizations.

Conclusion

Intranets facilitate the sharing of corporate knowledge and provide the infrastructure to support a learning organization. Perhaps the biggest change intranets bring to the way people work is the move from information push to information pull. Traditionally, information was pushed on employees through memos, reports and handbooks. This information is given out to everyone at the same time and may or may not be appropriate. Intranet usage focuses on information pull, where the "user determines what (either the specific nature of the information or just some form of information is needed) and when to access the information resources" (Harvey 112). Information pull, therefore, "reduces information overload by providing 'just-in-time' information" (Harvey 112).

An intranet enables employees to find and use information faster as well as providing them access to a holistic view of the organization. The intranet therefore helps users to achieve work objectives (Harvey 113). It also fosters communities within an organization, encouraging and increasing collaboration across an organization. Hills

writes that “sharing and cooperation will become the norm and people will stop hoarding information” (66). As intranets help to “break the corporate rhetoric,” employees will bond together rather than be alienated (Carlson 34). Above all, intranets bring organizations together and help to increase communication, collaboration and knowledge management.

BIBLIOGRAPHY:

Bernard, Ryan. "Building the Corporate Web: How to Use the Internet, Intranets, and Extranets to Gain a Competitive Advantage." White Paper from Wordmark Associates, Inc. Jul 1999. <http://www.wordmark.com/resources/pages/whitepaper.htm>.

"Check this out! The Asia Pacific Intranet" Inside Innovation Electronic Newsletter. Summer 1998. (Internal Communication of BD).

Carlson, Patricia. "Information Technology and Organizational Change." Proceedings on the seventeenth annual international conference on Computer documentation, 1999: 26 – 35.

Chen, Benjamin. "Fancy Footwork." Darwin. Dec 2000. <http://www.darwinmag.com/read/120100/headfirst_content.html>.

Collins, Heidi. Corporate Portals: Revolutionizing Information Access to Increase Productivity and Drive the Bottom Line. New York: Amacom, 2001.

Cortese, Amy. "Here Comes the Intranet." Business Week. 26 Feb. 1996. <http://www.businessweek.com/1996/09/b34641.htm>.

dePlanque, Alexis. "The Bitter Pill of Enterprise Portals." META Group Inc. Electronic Business Strategies. 7 Sep. 1999. (Accessed through a corporate subscription)

Derfler, Frank J. Jr. "The Intranet Platform: A Universal Client?" PC Magazine Online. 23 Apr. 1996. <http://www.zdnet.com/pcmag/issues/1508/pcmg0043.htm>.

"The Dominance of the Intranet." LPI Software Funding Group, March Commentary. Mar. 1998 http://www.lpilease.com/column.htm>.

Dorey, Tim. "For Sale: One Filing Cabinet, Good Condition. IDM. 21 Feb. 2001. <http://idm.internet.com/articles/2000102/pgs_02_21_01a.html>.

Dutton, Geoffrey. "A Portal in Every Pot." CIO. 20 Feb. 2001. <http://subscribe.cio.com/newsletter_text.cfm?ID=32>.

Gonzalez, Jennifer S. The 21st Century Intranet. New Jersey: Prentice Hall, 1998.

Guengerich, Steven L., Skipper McDonald, Douglas Graham, and Mitra Miller. Building the Corporate Intranet. New York: Wiley Computer Publishing, 1997.

Harvey, Michael G., Jonathan Palmer and Cheri Speier. "Intranets and organizational learning." Proceedings of the ACM 1997 conference on Computer personnel research April 3 - 5, 1997, San Francisco, CA USA:110-116.

Hills, Mellanie. Intranet Business Strategies. New York: Wiley Computer Publishing, 1997.

Horgan, Tim. "Developing your Intranet Strategy and Plan." CIO. 1998 <http://www.cio.com/WebMaster/strategy/printversion.html>.

Horgan, Tim. "What's Happening Inside? 10 Major Intranet Trends and What We Can Learn from Them." CIO. 21 Dec. 1999. <http://www.cio.com/forums/intranet/edit/intranet_trends.html>.

"Intranet, Firewall, Extranet, VPN." Def. Whatis?com. Oct. 2000. <http://whatis.techtarget.com/whome/0,289825,sid9,00.html >

Laalo, Allan T. "Intranets and competitive intelligence: Creating access to knowledge." Competitive Intelligence Review. Volume 9, Issue 4, 1998: 63-72.

Lai, Vincent S. "Intraorganizational Communication with Intranets." Communications of the ACM Jul. 2001: 95-100.

Miller, Mitra, Andrew J. Roehr, and Benjamin Bernard. Managing the Corporate Intranet. New York: Wiley Computer Publishing, 1998.

Robinson, Heather. "The Development of an Intranet as a Knowledge Management Tool." The Law Librarian. Jun. 1999: 95-97.

Rogers, Bill. "Intranet Advice." IDM. 17 Jan. 2001. <http://idm.internet.com/articles/200101/pia_01_17_01a.html>.

"R&D Technology Intranet Piloted" Inside Innovation Electronic Newsletter. Summer 1997. (Internal Communication of BD).

Scheepers, Rens and Jan Damsgaard. "Using Internet technology within the organization: a structurational analysis of intranets." Proceedings of the

international ACM SIGGROUP conference on Supporting group work: the integration challenge 1997: 9 – 18.

Vishik, Claire and Andrew B. Whinston. “Knowledge sharing, quality, and intermediation.” Proceedings of the international joint conference on Work activities coordination and collaboration 1999: 157 – 166.