Future of Intranet Technology

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White House Astrologer

All I want you to tell me is what will be the
Intranet technology in the year 1998.

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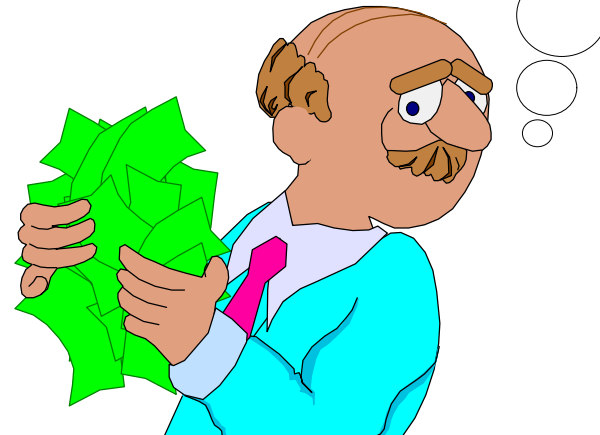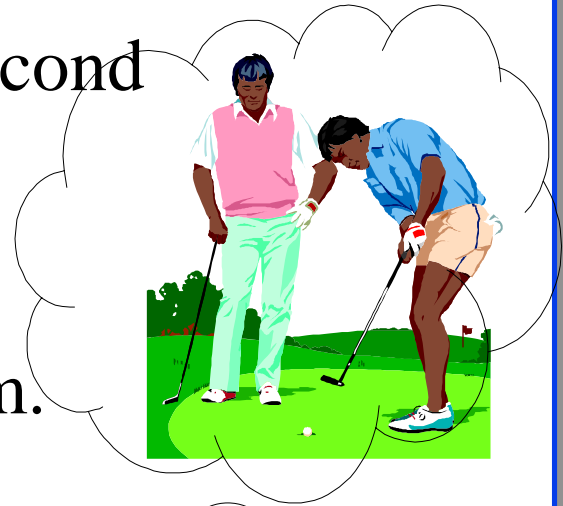
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Overview

❑ Advances in Information presentation

❑ Advances in Information retrieval

❑ Virtual Organizations

❑ Advances in routing Technology

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Trend: Profusion of Information

❑ High Technology $\Rightarrow$ Less labor $\neq$ More vacation

❑ High bandwidth $\Rightarrow$ More bits per second

❑ Hundreds of telegrams per day

❑ Short product development cycles

❑ Finding information is not a problem. Sorting through the hay stack is.

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Advances in Information Retrieval

- ❏ Intelligent Search Engines
- ❏ Intelligent Browsers
- ❏ Intelligent Agents
- ❏ Intelligent Help Desk
- ❏ Intelligent Monitoring

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Intelligent Search Engines

❑ Several corporations, e.g., Eastman Kodak, are experimenting with AI in Intranets

❑ Search engines can limit/extend based on anticipated user needs

❑ Natural language understanding

❑ FAQFinder finds FAQs that may contain answers to your questions. Works with the dynamic Internet environment. Intranet is easier, http://infolab.cs.uchicago.edu/faqfinder

❑ Scatter/Gather clusters data into semantically similar groups, http://theory.lcs.mit.edu:80/~karger/

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Intelligent Browsing

❑ Browsers learn user interests and provide a guided tour

❑ WebWatcher is a server-based interface agent.

    ❑ Replaces the requested pages with a modified version and follows the user.

    ❑ Learns by frequency of usage by others, other users interests, analyzing text, and reinforcement learning,
http://www.cs.cmu.edu/afs/cs.cmu.edu/project/theo6/web-agent/www.project-home.html
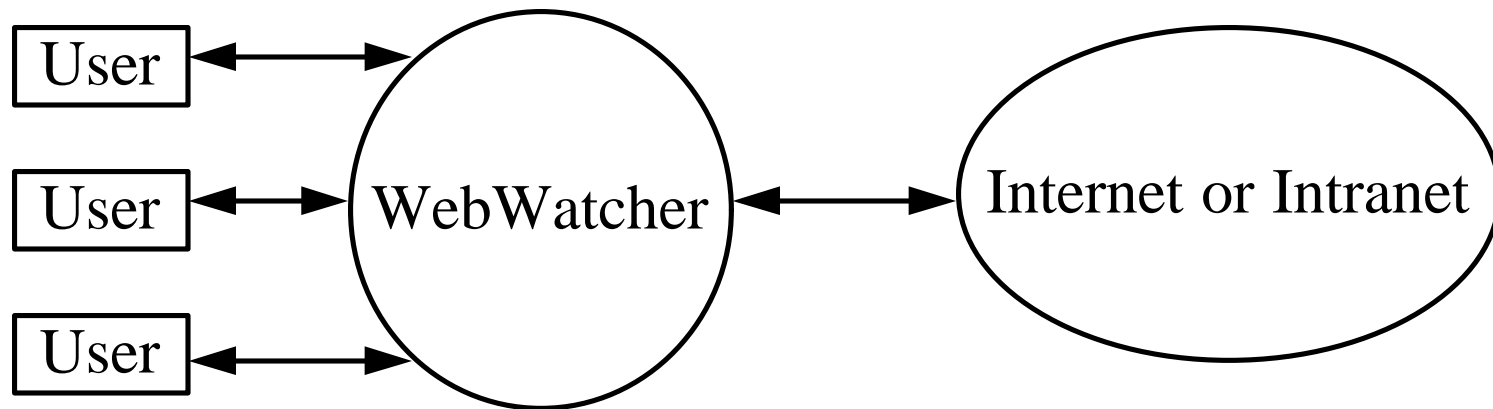
- Letizia is a client side personal agent. Learns by your usage and interests. Removes irrelevant information,
  http://lcs.www.media.mit.edu/people/lieer/Lieberary/Letizia/Letizia-Intro.html

Intelligent Agents

❑ Work in background while you are performing other tasks

❑ Work independently and with other agents

❑ Can derive data

❑ Personal $\Rightarrow$ Easily personalized

❑ Can alert you in the right context

❑ Browser Buddy can search all night to bring you the morning news, http://www.softbots.com

- ❑ Autonomy Agent employs neural nets to search for patterns and concepts. Learns by retraining and from incorrect results, http://www.agentware.com

- ❑ Webdoggie recommends web pages based on your preferences, http://webhound.www.media.mit.edu/projects/web-hound

- ❑ NewsWeeder II uses machine learning to find web pages and news articles that may be of interest to you, http://www.empirical.com

Intelligent Help-Desks

❑ ContactFinder monitors internal bulletin boards, extracts questions and refers them to employees who may be able to answer them. 86% accuracy. http://www.ac.com/cstar/hsil/agents/

❑ Globenet retrieves newsgroup postings pertaining to IBM products, processes it and files it according for use by customer service. Has built in natural language processing capability. Improved productivity by 30%, http://www.watson.ibm.com:8080

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Intelligent/Virtual Supervision

❑ With paper, it is impossible to ensure that you have read it

❑ With Web, we can ensure.

❑ We can predict your next move.

❑ Can be dangerous, browsing pregnancy leave policy $\Rightarrow$ Start looking for a substitute

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Extranets

❑ Secure communication with customers, suppliers and other trading partners

❑ Same data, different privileges for Intranet, Internet, and Extranet users

❑ Overlaid on intranet and Internet via tunneling. Network layer packet encryption and encaptulation.

❑ Several proprietary solutions and standards

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Virtual Organizations

❑ Distributed Organizations

❑ Meet on-line

❑ Help gather, retrieve, share relevant knowledge

❑ Can be rapidly assembled

❑ NextLink helps distributed engineering group. Engineers make decisions while agents check constraints and violations, http://cdtr.stanford.edu/NextLink/

Virtual Companies

❑ Complementary resources in cooperating companies are integrated to support a particular product.

❑ Underused resources are allocated. Not moved.

❑ ARPA/Air Force's AIMS (by Lockheed Martin, Texas Instrument, Rockwell, and others) is developing a network-based dual-use manufacturing and procurement infrastructure linking customers, suppliers, ...,
http://aims.parl.com/About-AIMS.html

Advances in Routing

❏ Large Address space

❏ Mobile IP

❏ Policy Based Routing: Allocate bandwidth for various applications

❏ Multicasting: Stock prices

❏ Quality of Service: Video conferencing

❏ High-Speed Routers

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Large Address Space

❏ Currently 20-30 Million internet users

❏ 300 Million hosts by 2000

❏ IPv6 addresses are 128-bit long. Fixed size

❏ $2^{128} = 3.4 \times 10^{38}$ addresses
  $\Rightarrow 665 \times 10^{21}$ addresses per sq. m of earth surface

❏ If assigned at the rate of $10^6/\mu$s, it would take 20 years

❏ Expected to support 8×10^{17} to 2×10^{33} addresses
  $8 \times 10^{17} \Rightarrow 1,564$ address per sq. m

❏ Allows plug and play

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Mobile IP

❑ You can take you notebook to any location

❑ Finds nearby IP routers and connects *automatically*

❑ Your Email is continuously delivered
   You can start a telnet or x-window session as if local

❑ Continuous access to your home resources
   Access to local resources: Printers

❑ Airports, Hotels, Hospitals will provide "Mobile IP connectivity"

❑ Cities will feature "Mobile IP Accessways"

❑ You can work while driving

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Summary
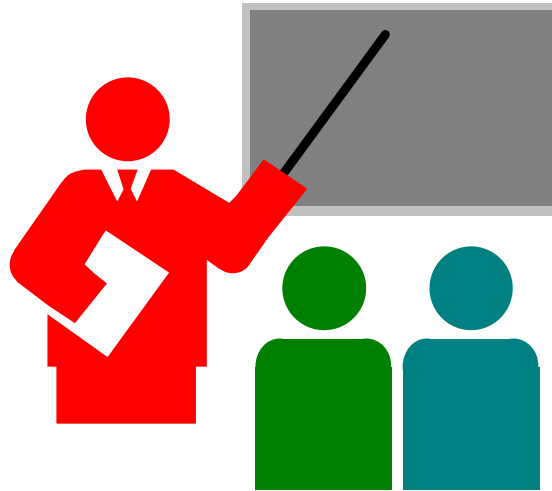
- ❑ Intranet technology is in its infancy

- ❑ Improvements in presentation, retrieval are coming

- ❑ Bandwidth, addressing, security, mobility, and quality of service issues are being resolved

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References

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- S. Holz, "The Intranet Advantage," Ziff-Davis Press, 1996.

- D. E. O'Leary, "The Internet, Intranets, and the AI Renaissance," Computer, January 1997, pp. 71-79.

- W. Ruh and M. Joseph, "Intranet: Crank it up," Networld, February 1997.

On-Line References

- Gigabit Ethernet, http:/www.cis.ohio-state.edu/~jain/netsem.html

- FAQFinder, http://infolab.cs.uchicago.edu/faqfinder

- Scatter/gather, http://theory.lcs.mit.edu:80/~karger/

- WebWatcher, http://www.cs.cmu.edu/afs/cs.cmu.edu/project/theo6/web-agent/www.project-home.html

- Letizia, http://lcs.www.media.mit.edu/people/lieer/Lieberary/Letizia/Letizia-Intro.html

- Browser Buddy, http://www.softbots.com

- Autonomy Agent, http://www.agentware.com
- Webdoggie,
  http://webhound.www.media.mit.edu/projects/web-hound
- NewsWeeder II, http://www.empirical.com
- ContactFinder, http://www.ac.com/cstar/hsil/agents/
- Globenet, http://www.watson.ibm.com:8080
- NextLink, http://cdtr.stanford.edu/NextLink/
- AIMS, http://aims.parl.com/About-AIMS.html
- Intercast, http://www.intercast.org

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Intranet Resources: On-line

❑ The Intranet Journal, http://www.brill.com/intranet

❑ The Intranet Resource Center,
http://www.cio.com/WebMaster/wm_irc.html

❑ Building a corporate intranet,
http://www.webcom.com/wordmark/sem_1.html

❑ Intranet Design Magazine, http://www.innergy.com

❑ Intranet Information Page,
http://www.strom.com/pubwork/intranet.html

❑ The Complete Intranet Resource,
http://www.lochnet.com/client/smart/intranet.htm

❑ Intranut magazine, http://www.intranut.com/index.htm

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- ❑ Intranet Resource Center, http://www.infoweb.com.au/intralnk.htm

- ❑ Intranet Solutions, http://www.netscape.com/comprod/at_work/index.html

- ❑ Intranet Strategy Day, http://www.microsoft.com/intranet

- ❑ Intranet Handbook Page, http://ntg-inter.com/ntg/intranet/intra_in.htm

- ❑ Intranet Knowledge Base, http://www.co-i-l.com/know_garden/intranets/