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

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- Advances in Information presentation
- Advances in Information retrieval
- Virtual Organizations
- Advances in routing Technology
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.
Advances in Information Retrieval

- Intelligent Search Engines
- Intelligent Browsers
- Intelligent Agents
- Intelligent Help Desk
- Intelligent Monitoring
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/.
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,

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Letizia is a client side personal agent. Learns by your usage and interests. Removes irrelevant information,

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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](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


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/](http://www.ac.com/cstar/hsil/agents/)

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 ⇒ Start looking for a substitute.
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 encapsulation.
- Several proprietary solutions and standards
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
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 $8 \times 10^{17}$ to $2 \times 10^{33}$ addresses
  $8 \times 10^{17} \Rightarrow 1,564$ address per sq. m
- Allows plug and play
Mobile IP

- You can take your 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


On-Line References

- FAQFinder, http://infolab.cs.uchicago.edu/faqfinder
- Browser Buddy, http://www.softbots.com
- Autonomy Agent, [http://www.agentware.com](http://www.agentware.com)
- NextLink, [http://cdtr.stanford.edu/NextLink/](http://cdtr.stanford.edu/NextLink/)
- Intercast, [http://www.intercast.org](http://www.intercast.org)
Intranet Resources: On-line


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