Text 8
User Interfaces

It's no secret that the amount of information-both on the Internet and within intranets-at the fingertips of computer users has been expanding rapidly This information onslaught has led to an interest in intelligent agents, software assistants that perform tasks such as retrieving and delivering information and automating repetitive tasks. Already, some 50 companies are developing agent software or services. Intelligent agents will be used in a range of applications, including user interfaces, desktop applications, messaging, commerce, and network management according to a survey by the GiGa Information Group.

Agents will make computing significantly easier. They can be used as Web browsers, help desks, and shopping assistants. IBM's Web Browser Intelligence (Webby), for example, is a prototype application that watches while you browse and records how often you visit sites, so that it can automatically download your favorite sites. More advanced agents such as IBM's Java-based Gingko can "learn" about a user's preferences and predict the user's behavior.

Combined with the ability to look and listen, intelligent agents will bring personal computers one step closer to behaving more like humans. This is not an accident. Researchers have long noted that users have a tendency to treat their personal computers as though they were human. By making computers more "social," they hope to also make them easier to use.

That is the thinking behind Persona, a project at Microsoft's User Interface Research group. Building on the Whisper speech engine developed by Microsoft and natural-language-processing technology, the group has created a lifelike computer assistant-a 3-D animated Parrot, named Peedy-that can interact with the user in a conversational manner. It lets the user search for specific music CDs and instructs Peedy to play them. To handle more complex computing chores, lifelike characters will need improved speech recognition, more flexible natural-language processing and better speech synthesis.

As these technologies enter mainstream applications, they will have a marked impact on the way we work with personal computers By 2001, the question will be not "what does software look like" but "how does it behave".

The Legacy of Artificial Intelligence, agents (software that performs tasks automatically) will ultimately reach a wide audience in the next few years, making Web sites and applications smarter. And though in 2001 agents will still have a long way to go, the convergence of secure Internet commerce and new standards that protect consumers, promises a bright future for agents on the Web.

By 2001, collaborative filtering, which applies recommendations from a community of users to individual users, will be common on the Internet. Through this technology, users are asked to rate a dozen or so movies; for instance, and the collaborative filtering agent recommends movies by matching users' preferences to like-minded users, Behind the scenes, collaborative filtering algorithms may be supplemented by neural networks and by other techniques.

One of the problems with this technology is the difficulty it entails in storing users' preferences. If users could take their network identities with them as they jump from Web site to Web site, they could-for example-have their tastes m books from an online bookstore reflected when they browse a movie Web site. One of the biggest concerns about handling personal information on Web sites is the issue of privacy. Clearly, unbridled access to Web suffers' preferences by vendors could result in Junk mail or worse. With the looming threat of government intervention in privacy issues, the industry has responded with a new standard called the Platform for Privacy Preferences Project (P3P).

The P3P standard should go a long way toward fostering collaborative filtering agents on the Web, by letting users carry their passports (network identities) with them from site to site. The potential for Internet commerce will surely increase as products and content are customized across Web sites for the same user. Moreover, P3P will help protect private information, so users will be able to store address and credit-card information with reputable Web sites from which they have previously bought products.

The most advanced notion of an agent, the mobile agent, is not standardized yet Mobile agents are programs that move from Web site to Web site, performing functions that range from information searches to product searches. Because these agents behave like actual, autonomous programs, issues of security are critical. A malicious agent could overload a Web site with multiple copies of itself. The idea of the mobile-agent is very appealing and has always attracted a lot of admirers, given the agents' potential ability to transform the way we work. But without mature standards for creating and running mobile agents, users won't see widespread use of them for several years. In the short term, mobile agents will be used primarily in specialized applications and in messaging systems for pagers and other hand-held devices.

The infrastructure for using agents is just now forming, and the payoff in the near future will be more personalized content, increased Internet commerce, and a richer computing experience.